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An Empirical Analysis of Nutritional Transparency Initiatives in Fast Food Chains: Pathways to Sustainable Social Development

Dr. Surbhi Mathur[1], Dr. Aditi Kaushik[2], Dr. Mehak Gulati[3]*

[1]*Faculty of Management, Manipal University Jaipur*

[2]*Assistant Professor – United world Institute of Management, Karnavati University, Gandhinagar, Gujarat*

[3]*Faculty of Management, Manipal University Jaipur*

*1*mathursurbhi20@gmail.com*,2kaushik.aditi25@gmail.com*,3*mehak.gulati15@gmail.com*

*Corresponding Author: Dr. Mehak Gulati

Abstract: Accessibility of nutritional information in fast food chains is trending due to paradigm shift in consumers' eating choices (Sahin & Gul, 2022 and Mason et al., 2020). The objective of study is to highlight the initiatives taken by fast food chains in respect of transparency of nutritional information and how this leads to social development in terms of regulatory nutritional disclosures and availability of healthier meals alternatives.

Convenience sampling was used, and a self- administered survey was employed to collect the data. A total of 405 responses were collected to align with the requirement of PLS-SEM. The results suggest that diverse choices on the menu do motivate the customer to make healthy choices, which adds to the overall social well-being. Also, mandatory disclosures of nutritional information do help customers to make well-informed decisions which further reduces the chances of diseases.

The findings underline the effectiveness of nutritional labelling as a public health strategy to encourage healthier eating habits. Fast food chains should implement clear nutritional information to cater to the increasing preference for healthier food options, as suggested by Sobaih & Abdelaziz (2022). The implications recommend that improving nutritional transparency can result in a shift in buyers' behaviour towards healthier eating, ultimately contributing to improved public health outcomes, as supported by Osman & Jenkins, 2021**.** Thereby, by integrating nutritional information into marketing strategies fast-food chains can not only improve their brand image but significantly impact buyer's behaviour towards healthy food choices.

Keywords: Nutritional Information, Public Health, Social Development, Fast Food, Buying Behavior

Introduction

India's fast-food market landscape has expanded significantly beyond its traditional street food to include various options, featuring both global and domestic fast-food chains. This rapid growth is supported by a rising revenue, with the Indian food service industry valued at $77.54 billion in

2024. Projections from the India Brand Equity Foundation (IBEF) indicate this will reach to $125.06 billion by 2029, showing a strong annual growth rate of 10.03% (IBEF, 2024). Quick Service Restaurants (QSRs), a key segment of the fast-food industry, have experienced significant growth. In 2022, the QSR market in India was evaluated $690.21 million and is expected to cross USD 1069.3 million by 2027 registering compound annual growth rate (CAGR) of 9.15% (Mordor Intelligence). This expansion is driven by the rising demand for convenient and quick dining options, especially among the young population aged 18-35, who frequently dine out and find fast food appealing (Mordor Intelligence). Considering the growth trajectory, even the international fast-food chains expanded their presence in India. This expansion has contributed to the growth of industry. Additionally, the rise of cloud kitchens and online food delivery services has further accelerated this trend, making fast food more accessible to a broader audience. Overall, the Indian fast-food industry is poised for rapid growth as driven by evolving consumer preferences and the increasing popularity of dining out and food delivery services.

Consumers are increasingly seeking convenience, affordability, and variety. The rise of customization options and healthier alternatives allow chains to introduce salads, grilled chicken, and plant-based alternatives (Schlosser, 2001). McDonald's offers various menu options where customization is possible, like Big Mac, Apple Pie, Egg McMuffins. Nutritional transparency has emerged as a pivotal concern for the global food industry, especially for fast-food restaurants. Nutritional transparency refers to the clear, accessible disclosure of calorie counts, ingredient lists, and nutrient composition by food providers, enabling consumers to make informed dietary choices. As consumers become increasingly health-conscious and demand greater accountability from food providers, the disclosure of nutritional information has transitioned from a voluntary marketing strategy to a regulatory and ethical imperative. The rising incidence of obesity and diet-related health issues has intensified the nutritional content of fast-food into sharp focus for consumers, health authorities, and policymakers (Afroza et al., 2024). Fast food has been identified as a major contributor to energy-dense diets rich in calories, saturated fats, sodium, and sugars, while often lacking essential nutrients such as dietary fiber and vitamins (Jahan et al., 2020). In response to mounting public concern and within the broader public health initiatives, the fast-food industry has seen a growing push for nutritional transparency. This shift is reflected in both regulatory and voluntary measures, including the display of detailed nutritional content on menus and menu boards. A key driver of this trend is the belief that by providing consumers with accessible nutritional information at the point of purchase, they will be empowered to make healthier food choices Sobaih & Abdelaziz (2022); Mohiuddin & Nasirullah (2020);Radwan et al. (2017); White et al. (2016); Montandon and Colli (2016); Wellard et al. (2015); Tandon et al. (2011); Chand et al. (2011); Dumanovsky et al. (2010); Burton et al. (2009). The availability and accessibility of nutritional information across diverse populations regardless of socio-economic status are critical for empowering consumers to control their nutritional intake and adopt healthier eating patterns (Robinson et al., 2023; Afroza et al.,

2024).

The Food Safety and Standards Authority of India (FSSAI) is actively working to improve food safety and require clear nutritional information. According to a 2024 amendment by the Ministry of Health and Family Welfare, the FSSAI has mandated that nutritional details, such as the amount of sugar, salt, and saturated fat, must be clearly displayed on the front of food packaging. This change is designed to help consumers better understand what they're eating and make healthier choices. Ultimately, this move not only empowers consumers but also supports the global effort to fight the rise of non-communicable diseases (NCDs) and improve public health. The FSSAI's focus on developing clear, easy-to-read labeling is a key step in this broader initiative. Drawing a parallel, South Korea has also enacted legislation that mandates fast-food chains to disclose the caloric, sugar, protein, and fat content of their menu items (Ahn et al., 2015). The goal of these regulations is to equip consumers with the necessary information to make better choices, which, in turn, is expected to help lessen the societal impact of illnesses related to diet.

Government regulations and policies play a pivotal role in mandating nutritional labeling in fast food chains, thereby institutionalizing transparency and ensuring fair disclosure practices. Such policies not only compel fast food retailers to provide accurate and trustworthy nutritional data but also promote accountability for consumer well-being (Sharib, 2024; Kraak, 2014). These regulatory frameworks help bridge information asymmetries and reduce disparities in nutritional knowledge among consumers, fostering equity in public health nutrition (Robinson et al., 2023).
Research findings on the effectiveness of nutritional transparency initiatives are contradictory, sparking ongoing debate. Some studies indicate that providing calorie information on menus can lead to a decrease in the number of calories consumers order, while other research shows no significant change in their purchasing habits (Ahn et al., 2015; Patchutthorn & Tabari, 2022). This inconsistency suggests that consumer behavior is multifaceted and not solely determined by nutritional data. Other factors including price, taste, convenience, and personal health consciousness also play a crucial role in their final food choices (Patchutthorn & Tabari, 2022).

The combined effect of consumer awareness, accessible nutritional information, and regulatory oversight extends beyond individual choices to influence broader social development outcomes. Nutritional transparency supports public health by reducing the prevalence of diet-related diseases, lowering healthcare costs, and enhancing health literacy and nutritional education at the community level (Yngve, 2010; Malik et al., 2025). By fostering an environment that prioritizes informed food consumption and healthy lifestyles, these measures contribute to sustainable social progress and improved quality of life.

The study conducts a comprehensive analysis of nutritional transparency initiatives employed by fast-food chains, exploring their implementation, consumer reception, and impact on food choices and public health outcomes. By synthesizing empirical data, the research evaluates whether these

efforts represent authentic contributions to public health improvement or function primarily as strategic displays within a competitive commercial landscape. Thus, the intersection of consumer awareness, accessibility of nutritional information, and regulatory policy creates a foundation for nutritional transparency that is instrumental in shaping healthier communities and advancing social development goals. This motivates to centered on research questions:

1. To what extent are consumers aware of nutritional transparency initiatives provided by fast food chains?
2. How accessible is nutritional information to consumers across different demographic and socio-economic groups at fast food chains?
3. How do government regulations and policies influence the implementation of nutritional transparency in fast food chains?
4. What is the impact of nutritional transparency on consumer food choices, including calorie awareness and frequency of fast-food consumption?
5. How does nutritional transparency through policy and regulation contribute to health literacy and education for society at large?
6. In what ways does nutritional transparency in fast food restaurants influence social development outcomes such as public health and healthcare cost reduction?

Literature Review

The prevalent trend of fast-food consumption indeed stems from its convenience offered by quick service restaurants, appealing to individuals with hectic lifestyles. Urbanization and changing lifestyles play a significant role, as peopleseek quick meal options. Social gatherings and cultural trends also contribute, making fast food a social activity, particularly among younger generations. The rise of food delivery apps and online ordering systems further fuels its consumption. Fast food consumption is influenced by a complex interplay of demographic, socioeconomic, and cultural factors. Fast food consumption is more frequent among younger individuals, particularly young black men, even those with university degrees and well-paying jobs. It also varies by income, with middle-income and wealthier people consuming more Ufholz & Werner (2023). The study of (Sajjad and Hill, 2023) examined social eating habits, societal values and individual food choices as determinants of fast-food culture.

The researchers in past studies identified varied reasons to patronage fast food outlets, like convenience, socialization, quality of food, service, ambience, food variety, taste, offers and discounts (Abdullah et al., 2017; Ratna Anmol, 2017; Deivanai P., 2016; Keshari and Mishra, 2016; Prabhavathi et al., 2014; Ali and Nath 2013; Rauf and Butt 2012; Anand Ritu, 2011; Islam and Ullah, 2010; Goyal and Singh, 2007). The increased populace of young demographics made fast-food consumption more common among college goers, university students due to promotional offers, celebration of special occasions (Abdullah N.N. et al.,2017; Keshari & Mishra,2016; Srivastava R.K.,2015; Baig & Sayeed 2012; Goyal and Singh 2007; Islam and Ullah, 2010).

Awareness of nutritional information and behavioural outcomes

With the execution of mandate nutrition labeling on food items, studies of Sobaih & Abdelaziz (2022); Mohiuddin & Nasirullah (2020);Radwan et al. (2017); White et al. (2016); Montandon and Colli (2016); Wellard et al. (2015); Tandon et al. (2011); Chand et al. (2011); Dumanovsky et al. (2010); Burton et al. (2009) evidenced that display of nutritional information at point-of-purchase, like on product package andmenu boards, usage of color-coded signals aid consumers to choose healthier food meals. Consumer awareness of nutritional transparency has been increasingly recognized as a critical factor influencing food choices, particularly in the fast food sector. Transparent nutritional labeling empowers consumers by providing them accessible information about calories, ingredients, and portion sizes, which facilitates healthier decision-making (Ahn et al. 2015). Studies consistently show that the presence of calorie information on fast food menus leads to a measurable shift in consumer behavior, with individuals often opting for lower-calorie items when nutritional data is clearly presented (Wilkinson 2025; Rummo et al. 2023). For many consumers, calorie labeling also enhances their ability to control portion sizes, thereby aiding in better dietary regulation when eating out (Shangguan et al. 2018; Lee et al. 2018). This effect contributes to a broader behavioral change including a reduction in the frequency of fast food consumption, linking nutritional transparency to healthier lifestyle adaptations (Wilkinson 2025; Shangguan et al. 2018).

Furthermore, consumers show a preference for fast food establishments that provide detailed and trustworthy nutritional information (Priya et al. 2023; Sobolev et al. 2025). Trust in the accuracy and comprehensiveness of nutritional disclosures enhances the credibility of food providers and influences patronage decisions, with transparency acting as a competitive advantage (Priya et al. 2023).

Thereby, the hypothesis states that:

H1: Higher consumer awareness of nutritional transparency in fast food chains is positively associated with healthier food choices, characterized by reduced selection of high-calorie items.

Accessibility Factors

Mandatory nutritional disclosures in fast food chains have been shown to contribute significantly to the reduction of obesity and diet-related diseases by enabling consumers to make more informed food choices. For instance, legislation requiring calorie and nutrient labeling on menus, as implemented in jurisdictions like New York City and South Korea, has resulted in measurable decreases in calorie consumption per transaction and encouraged healthier selections among consumers (Ahn et al., 2015; Weitzman, 2025). These interventions have the potential to mitigate the public health burden of obesity by creating an environment that supports healthier eating behaviors.

Nutritional transparency in fast food settings also has broader economic implications, helping to reduce healthcare costs associated with poor dietary habits. Transparency initiatives that provide

accessible nutritional information are posited to lower overall healthcare expenditures by encouraging healthier diets and reducing the incidence of chronic diseases related to obesity and poor nutrition (Yngve, 2010; Malik et al., 2025). By empowering consumers with knowledge, nutritional labeling can steer demand toward lower-calorie and more nutrient-dense options, ultimately lessening the pressure on healthcare systems caused by diet-related illnesses.

The effectiveness of nutritional transparency is enhanced when combined with public education campaigns. Research indicates that educational initiatives paired with menu labeling increase consumer awareness and use of nutritional information, prompting healthier eating patterns and greater sustained behavioral change (Biesbroek et al., 2018). These programs equip consumers with the skills and motivation to interpret and apply nutritional data, thus amplifying the impact of transparency efforts.

Moreover, the display of nutritional information on menus has pressured fast food chains to expand their offerings to include healthier options. Chains are increasingly responding to consumer demand for transparency and health-conscious choices by introducing items with lower calories, reduced sodium, and improved nutrient profiles (Rummo et al., 2023). This shift not only benefits consumers but also enables fast food providers to stay competitive in a market that values health and accountability. This encouraged authors to test the following hypothesis:

H2: Greater accessibility to nutritional information leads to a reduction in the frequency of fast food consumption among consumers.

Regulatory and Policy Influence

Government-mandated nutritional labeling has been instrumental in enhancing public access to dietary information across diverse socioeconomic groups. Research highlights that mandatory nutrition disclosure policies, such as front-of-pack labeling, improve transparency and provide essential nutritional data consistently, thus benefiting individuals regardless of their economic status or educational background (Afroza et al., 2024; Robinson et al., 2023). Although some variance in effectiveness exists due to factors like health literacy, the overall evidence suggests that such regulations help level the informational playing field by bridging gaps in consumer knowledge.

Nutritional regulations also serve to promote fairness by holding fast-food retailers accountable for consumer well-being. Mandatory labeling compels retailers to disclose accurate nutritional values, preventing selective reporting or omission of unfavorable information, which fosters responsible practices within the industry (Sharib, 2024; Kraak, 2014). This accountability aligns with public health goals by incentivizing reformulation of menu items to reduce harmful nutrients while assuring consumers that dietary risks are being transparently communicated.
Furthermore, transparency regulations strengthen trust between consumers and fast-food providers. Transparent nutritional disclosure satisfies growing consumer demand for openness,

enhancing perceptions of honesty and reliability in food businesses (Wu et al., 2021). When fast-food chains openly share detailed and credible information about their products, consumer confidence improves, which not only supports informed decision-making but also builds brand loyalty and long-term customer relationships. Here, the hypothesis is framed as:
H3: Government-mandated nutritional labeling policies significantly enhance the provision and accuracy of nutritional information in fast food chains.

Social Development

The presence of calorie information on menus has been empirically shown to influence consumer food choices, prompting many individuals to select lower-calorie options and reduce their overall intake of high-calorie items. Studies highlight that calorie labeling can decrease calories ordered, particularly when presented alongside recommendations for daily caloric intake, leading to more informed and health-conscious decisions (Kiszko et al., 2014; Tanasache, 2025). This behavioral adjustment is associated with a reduction in the frequency of fast food consumption, contributing positively to diet quality and weight management.

Mandatory nutritional disclosures in fast food chains are an effective policy mechanism to combat obesity and related diet-induced diseases. Regulatory frameworks requiring transparent nutritional labeling have demonstrated reductions in calorie consumption and have encouraged reformulation of menu items to lower unhealthy nutrient content (Afroza et al., 2024). These policies not only benefit individual consumers but also drive systemic change within the food industry toward healthier product offerings.

Beyond individual behavior change, nutritional transparency plays a critical role in reducing healthcare costs attributable to poor diets. Enhanced access to dietary information allows consumers to make choices that prevent chronic conditions, thereby alleviating the economic burden on healthcare systems (Yngve, 2010; Malik et al., 2025). This cost mitigation is vital as diet-related diseases continue to strain public health resources globally.

Moreover, policy-driven nutritional transparency fosters health literacy and nutritional education among the general population. Public education campaigns paired with mandatory labeling improve awareness, comprehension, and utilization of nutritional data, empowering consumers to adopt sustained healthy eating behaviors. Health literacy emerges as a social asset that enhances collective well-being and supports the Sustainable Development Goals by reducing poverty and hunger through informed dietary choices.

Lastly, these transparency initiatives contribute to cultivating a culture of health and wellness within communities. By normalizing access to nutritional information and encouraging healthier food environments, nutritional labeling supports social development that prioritizes preventive health and community resilience (Petimar et al., 2021). This cultural transformation underlines the

societal value of transparency as a lever to promote holistic health beyond individual effects.

Overall, social development is measured in tune with stated hypotheses:
H4: Mandatory nutritional disclosures in fast food chains contribute to increased health literacy and nutritional education among consumers.
H5: Nutritional transparency initiatives foster a culture of health and wellness, thereby positively impacting social development through reduced obesity rates and diet-related diseases.
H6: Nutritional transparency in fast food chains reduces healthcare costs linked to poor dietary habits by encouraging healthier consumer behavior.

Methodology

Research Instrument

The core rationale of the study is to identify how various aspects of nutritional information and disclosures promote societal well-being in the fast-food market. The instrument used to assess the selected aspects of nutrition information and disclosures (Transparency in nutritional information (CANI), accessibility of nutritional information (ANI), regulatory and policy influence (RPI), and overall impact on social development (SD)) was developed using a staged scale development procedure. An extensive analysis of the literature was done to operationalize the factors. The purpose of this qualitative method to review the literature was to extract any underlying originality or attributes that are specific to the Indian context.

Based on intensive literature review a self-administered structured questionnaire, with 14 items were identified to be relevant and most associative with these constructs. The 14 items are shown in Table I. The first eight items measure the level of clarity and transparency in the nutritional information shared by the vendors, and the rest six measures the overall impact of the independent variables on social development. Additionally, the scale ranges from Strongly Disagree (1) to Strongly Agree (5).

Sample Design and Data Collection

The study is exploratory and the target population was kept liberal in order to get diversified responses. Further, convenience sampling was used and a self- administered survey was employed to collect the data. A total of 405 responses were collected to align with the requirement of PLS-SEM. Though with PLS-SEM analysis can be performed even on a relatively small sample, the time allowed for collecting a significant number which helped the research to reduce the limitation of small samples in later stages.

Tool Selection and Analytics

For hypothesis testing in the study SmartPLS 4.0, Partial Least Square – Structural Equation Modelling is used. Though the approach and the software have significantly been questioned, the tool is well-established to calculate path coefficient value in SEM models and hence is becoming quite popular among modern researchers. One key aspect associated with the popularity of the

technique is its ability to design a latent constructs-based model in the conditions of non-normality and small sample data (Hair, Hult, Ringle & Sarstedt, 2013). Furthermore, the tool seemed to be more compatible with the study as it is capable of measuring one section of the study based on a single-item construct (Hair et al., 2013). Further, the study used the Bootstrapping technique (5000 resample) to ascertain the significance levels of the suggested hypothesis after the PLS algorithm procedure established the significance levels of the loadings, weights, and path coefficients.

Findings and Result

Measurement Model

The first step in the model was to perform the test of convergent validity. For the purpose, factor loadings of the latent variables, composite reliability (CR) and average variance extracted values (AVE values) were assessed (Hair, Black, Babin, Anderson & Tatham, 2006). The item loadings are shown in Table I which were above the threshold value of 0.6 (Chin, 1998). The composite reliability (CR value) that indicates the extent of construct indicators indicating the latent construct was also found more than the recommended value of 0.7 (Hair et al., 2006). Lastly, AVE values that indicate how much of the overall variance in the indicators is explained by the latent construct, also exceeded the threshold value of 0.5 (Hair et al., 2006).

Table I. Loadings - Measurement Model

	Outer Loadings	AVE	CR
Consumer awareness of nutritional transparency		.583	.739
I am aware that fast food chains provide nutritional information on their menus or websites.	0.648		
Nutritional labeling helps me control portion sizes when eating fast food.	0.848		
I choose fast food chains that offer detailed and trustworthy nutritional disclosures.	0.780		
Accessibility of nutritional information		.789	.735
Public education campaigns paired with nutritional transparency are effective in changing unhealthy eating patterns.	0.908		
The display of nutritional information on menus has led to fast-food chains offering a wider variety of healthier options.	0.869		

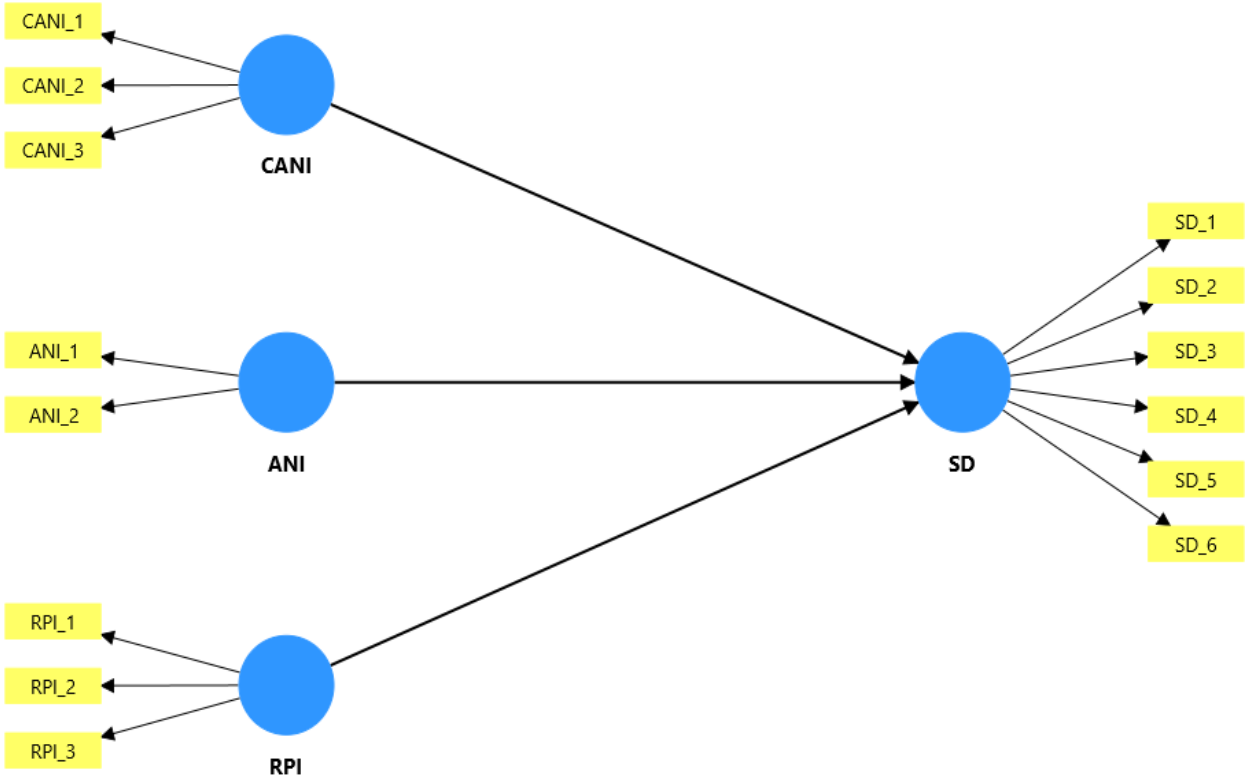
Regulatory and Policy Influence		.721	.806
Government-mandated nutritional labeling enhances public access to dietary information across all socio-economic groups.	0.833		
Nutritional regulations promote fairness by fast-food retailers as accountable for consumer well-being.	0.884		
Transparency regulations strengthen trust between consumers and fast-food retailers.	0.829		
Social Development		.553	.831
The presence of calorie information on menus has made me change my food choices like I am less likely to order high-calorie items.	0.845		
The availability of nutritional data has led me to reduce my frequency of fast food consumption.	0.791		
Mandatory nutritional disclosures in fast food chains can significantly reduce obesity and diet-related diseases.	0.806		
Nutritional transparency in fast food chains can reduce healthcare costs associated with poor diets.	0.815		
Policy-driven transparency fosters health literacy and nutritional education among the general population.	0.755		
Nutritional transparency initiatives foster a culture of health and wellness within the community.	0.678		

The next step was to measure the discriminant validity which assesses the extent to which the variables are not a reflection of each other and is measuring distinct values. The values turned out (at diagonals) to be square root of the AVE values. In nutshell, the model showed adequate levels of both discriminant and convergent validity.

Structural Model

To assess the inner model or structural model, hypothesis testing was used by SmartPLS 4.0. To check the statistical significance of the weights of the sub-constructs and path coefficient value, a bootstrapping process with 1,000 iterations was performed (Chin, Peterson & Brown, 2008). As the SmartPLS technique doesn't really calculate the goodness of fit index directly, R2 value was considered which shows the explanatory power of the model (Wasko & Faraj, 2005). In the study the R2 value turned out to be 0.650, representing the high degree of contribution of the constructs

to the dependent variable, hence contributing to the designed hypothesis.
Further, in the model the highest contributing construct turned out to be Regulatory and Policy Influence as it represents almost 40% of the indicator's contribution. It can be implied that regulatory frameworks plays a crucial role in the societal well-being of the consumers.



In context of hypothesis testing, all the three designed hypotheses were measured at 0.000 p values, which leads to accepting the hypothesis. A comprehensive summary of the results according to study is shown in Table II.

Table II. Hypothesis Results

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
ANI -> SD	0.336	0.334	0.065	5.139	0.000
CANI -> SD	0.150	0.152	0.058	2.584	0.010
RPI -> SD	0.427	0.428	0.060	7.157	0.000

Discussion & Implications

Transparent nutritional initiatives of fast-food chains are through displays at point-of-purchase,

calorie count on packaging and menu boards, and usage of color-coded signals that help consumers to be decisive about healthy and informed food choices. The study has analyzed social development through nutritional transparency in fast-food chains. The data had been collected from 405 respondents and PLS-SEM was used to analyze social development aspects. The results suggest that diverse choices on the menu does motivate the customer to make healthy choices which adds to the overall social well-being. Also, mandatory disclosures of nutritional information do help customers to make well-informed decisions which further reduces the chances of diseases.

The study findings can assist fast-food retailers to match balance between social developments and nutritional transparency. Mandatory disclosures in fast-food chains entail more positive outcomes in terms of public health. In tune with this, awareness campaigns regarding the availability of healthier alternatives and accessible calorie counts in meals turn out to be ethical and social responsibilities of regulatory authorities. This foster consumers' trust in the system and ensures mitigation of health risks associated with fast-food consumption.

Limitations and Future Research

When evaluating the findings of this study, it is important to recognize the limitations. While looking at the sample size, it is important to note that it provides the general outlook, but the results need more substantiation to make any scientifically valid conclusions. Given the rapid pace at which the health-conscious segment of population is advancing, such lines of inquiry are likely to be developed further and more extensively in the future. Employing both qualitative and quantitative approaches will be very necessary for complete comprehension. It follows from the data gathered in the present research as social development dimensions in respect to nutritional initiatives by fast-food retailers still required to realize its full potential. It must be pointed out though that the present findings are quite broad and lack the dimension that further studies could facilitate.

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