

An Integrated Consumer Decision-Making Framework for Fortified Edible Oil Adoption



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Abstract

Micronutrient deficiencies are still one of the biggest public health problems in the developing world, especially in India, where fortified edible oils have been brought forward as a major nutritional solution. However, even though the policy environment has been very supportive and supply-side availability has shown some signs of improvement, consumer adoption of fortified edible oils remains very erratic and heavily dependent on local context. Most theoretical frameworks address this problem only through single-theory perspectives, and the complex interactions among values, health beliefs, social influences, and modern digital factors remain largely unexplored. This paper puts forward an integrated conceptual framework aimed at understanding consumer decision-making in the adoption of fortified edible oils, based on a systematic theory-building approach. Using the Value-Attitude-Behaviour (VAB) model, the Health Belief Model (HBM), and the Theory of Planned Behaviour (TPB) as the main sources, the framework is located within the Antecedents, Decisions, Outcomes, Theory, Context and Method (ADO-TCM) scheme. The framework presented in the paper sees health consciousness, cultural food beliefs, perceived benefits, and perceived barriers as the main antecedents that decide consumer attitudes toward fortified edible oils. Attitude, as well as subjective norms and perceived behavioural control, are expected to be the factors affecting purchase intention, which is the main behavioural outcome. Interestingly, the framework puts forward ambivalence and digital trust as moderator variables that determine how strong the attitude-intention linkage is, thereby not only coping with emotional dissonance but also recognising the increasing influence of online health information on consumer decision-making.

Keywords: Fortified edible oils; Consumer decision-making; Health Belief Model; Theory of Planned Behaviour; Digital trust

1. Introduction

Micronutrient deficiency, also known as “hidden hunger”, because its effects are invisible but very harmful, is one of the top public health problems that developing countries are facing. According to the World Health Organisation (WHO) and the Food and Agriculture Organisation (FAO) estimates, more than 2 billion people worldwide do not have enough micronutrients in their diets. As a result, their immune systems are weakened, their work capacities are lowered, and they have a higher risk of getting sick (WHO, 2020; FAO, 2019). On the other hand, India is still struggling with very high levels of anaemia and other forms of micronutrient deficiencies among women and children as per the recent National Family Health Survey (NFHS-5, 2021). This highlights the critical need for widespread nutritional programmes.

Food fortification is now recognised as one of the potential ways to cost-effectively tackle micronutrient deficiency at the population level. Fortified edible oils, among other things, have been advanced as an effective means of providing fat-soluble vitamins like A and D to many people,

especially in South Asia, where edible oil forms part of one's daily diet (Expert Market Research, 2026). However, even with supportive regulatory frameworks and better supply-side availability, the consumer adoption of fortified edible oils is still very inconsistent and context dependent. In fact, uptake depends not only on product availability or awareness but also on the complex interplay of personal values, health-related beliefs, social influences, emotional ambivalence, and the credibility of digital information sources, which is becoming increasingly important nowadays (Asmithaa et al., 2025). Getting to grips with these factors is necessary for developing strategies that will make nutritional policies result in permanent behaviour changes.

The impact of the COVID-19 pandemic on the adoption of dietary supplements and functional health products has not been extensively examined in depth, and existing studies have largely relied on single-theory perspectives. For example, the Theory of Planned Behaviour (TPB; Ajzen, 1991) identifies intention antecedents as attitudes, subjective norms,

and perceived behavioural controls (PBC), but it does not properly address the underlying value systems that drive food choices. The Health Belief Model (HBM), given by Rosenstock (1974), mainly concentrates on risk perception, benefits, and barriers, but does not integrate social norms and personal values very well. The Value-Attitude-Behaviour (VAB) model, while highlighting the importance of value orientations, is less focused on the belief-based or cognitive-social aspects (Homer & Kahle, 1988). Besides, these models individually do not reflect the influence of digital information environments on consumer trust or the emotional ambivalence that consumers most often experience when assessing functionally enriched food products. These limitations of existing models make them incapable of fully explaining consumer behaviour in diverse and emerging economies like India.

By merging the VAB, HBM and TPB in the Antecedents, Decisions, Outcomes, Theory, Context and Method (ADO-TCM) framework (Paul et al., 2021), this study offers a comprehensive and unified view of consumer decision-making in the fortified edible oils knowledge gap. Besides, it introduces two moderating variables - ambivalence and digital trust - to emotionally and contextually explain, respectively, what the traditional theoretical frameworks have ignored for so long. Four interlinked major goals are achieved through this paper: (i) to create a holistic concept framework that describes the antecedents, decision processes, and behavioural outcomes of the consumption of fortified edible oils; (ii) to study the effects of value and health-related antecedents, especially health consciousness, cultural and food beliefs, perceived benefits and barriers on the formation of consumer attitudes; (iii) to develop theoretically the attitude mediating role in converting these antecedents to purchase intentions; and (iv) to illustrate how ambivalence and digital trust as moderators can affect the degree of attitude-intention correlation.

The rest of the paper is organised in the following way. Section 2 examines the theoretical basis and identifies gaps in the current consumer behaviour literature. Section 3 explains the way the theory was developed and how the ADO-TCM lens was used in the analysis. Section 4 presents the integrated framework, its elements and hypotheses, and discusses how it compares with previous models. Section 5 addresses limitations, while Section 6 wraps up with theoretical contributions, practical implications, and suggestions for future empirical research.

2. Literature Review

2.1 Theoretical Foundations of Consumer Decision-Making

Researchers have analysed consumer decision-making for health-oriented food products with traditional behavioural/psychological theories. TPB,

among these, is a dependable framework that explains how behavioural intentions can be affected by attitudes, subjective norms, and perceived behavioural control components (Ajzen, 1991). This theory is a preferred one for predicting the consumers' behaviours in the domain of food/ health since it has been backed up by a multitude of samples and studies (Armitage & Conner, 2001).

Latest research on fortified edible oils reveals that consumer purchase decisions depend mostly on health consciousness and cultural preferences of the target segment, which indicates TPB as a very useful tool for recognising and predicting behaviour in the context of food consumption (Asmithaa et al., 2025). Work on functional beverages in the post-COVID situation discloses that subjective norms and digital trust serve as moderators, which makes the role of TPB more comprehensive as regards explaining health product adoption in the modern world (Natarajan et al., 2022). Analysis on dietary supplement use during the pandemic revealed that perceived behavioural control and attitudes strongly determined eating habits, which, on the other hand, corroborates the TPB's validity in health-related decision making once more (Mahmudiono et al., 2022).

HBM clarifies the way someone's health perceptions (e.g. perceived benefits and perceived barriers) can determine their preventive behavioural changes (Rosenstock, 1974). In the case of adopting fortified foods, this model is undoubtedly a reference point because the individuals' perceptions of health benefits and health risks play a precursor role to this decision (Janz & Becker, 1984). Mahmudiono et al., (2022), for example, showed that perceived susceptibility and perceived benefits had a strong effect on the decision to take supplements among the adults who had and who had not had COVID-19, which confirmed the relevance of HBM in dietary adoption. Likewise, Satyapriya, Bishnoi, Lenin, & Kumar (2021) studied the intention of consumers towards fortified foods in Delhi by applying the TPB. They revealed that perceived benefits and barriers can be considered as the most influential factors of adoption and are very much in line with the HBM constructs. Regarding the fortified food sector, Chaurasia, Mukherjee, & Dutta (2025) pointed out that perceptions of safety and the health benefits were the main factors that marked the difference in the willingness to accept, which also shows the model's relevance to functional and fortified foods.

VAB model holds a value-based view by outlining how a person's long-lasting values affect their attitudes and therefore their behaviour (Homer & Kahle, 1988). In contrast, the VAB includes inductively identified cultural and psychological factors which are very much intertwined with food-related decision-making (Grunert, 2011). For instance, the research by Steptoe, Pollard, & Wardle (1995) indicated that the reasons for choosing food

like health, convenience, and sensory appeal are very closely connected to the main value orientations underlying the individuals, thus indirectly supporting the VAB approach to the matter. In the same Lusk & Briggeman (2009) discovered that the main values, such as security and tradition, have a significant impact on the formation of consumers' preferences for food attributes, which further supports the model's focus on value-based attitudes. Moreover, Vermeir & Verbeke (2006) recently made a point that sustainability values play a major role in determining attitudes towards organic and functional foods, which is a perfect example of how cultural and psychological value systems direct behaviours related to food.

Each of the above theories brings forward critical evidence; however, if used alone, they are unable to grasp the complex nature of consumer behaviour, especially when it comes to health, culture, and the socio-economic diversity aspects.

2.2 Integrated Approaches in Consumer Behaviour Research

Integrated approaches have recently been the focus of some studies to explain quite complicated consumer behaviours. It is through a combination of TPB with other added constructs that Conner and Sparks (2002) demonstrated that the explanatory power does get enhanced in the research of food choice and health behaviour. Also, due to the increasing presence of digital environments, trust-related constructs are being considered mainly in the context of online and e-commerce (Gefen et al., 2003). Based on this line of reasoning, Satyapriya et al. (2021) used TPB for studying the adoption of fortified foods in Delhi and identified perceived benefits and barriers as key factors (along with HBM), through which they influenced behavioural intention. In the same Mahmudiono et al. (2022) reported that supplement intake during COVID19 was explained through perception of susceptibility and benefits (HBM) along with attitudes (TPB) and on top of that, they even drew attention to the merits of the integrated approach. One more way in which the VAB perspective broadens the matter is by showing how traditional food beliefs and deep-seated values relate to attitudes. The Food Choice Questionnaire by Steptoe, Pollard, & Wardle (1995) was a case in point. Lusk & Briggeman (2009) took another step to show that values like security and tradition are determinants of people's food attribute preferences, so they also stand for the VAB perspective. Vermeir & Verbeke (2006), a couple of years ago, demonstrated that the desire to live in a sustainable way is influencing people's attitudes toward organic and functional foods, thereby establishing the link between VAB and TPB's intention element. Finally, Asmithaa et al. (2025) found that elements like awareness, affordability, and cultural beliefs operating in TPB, HBM, and VAB

dimensions, respectively, help in understanding the purchasing behaviour of multi-source fortified edible oils.

Conversely, the technology adoption literature suggests that the recognised benefits and confidence are the main factors that influence the behavioural intentions (Venkatesh et al., 2003). These elements are increasingly relevant in the case of food consumption as consumers look to digital platforms to find health-related information. Precisely, Gefen et al. (2003) found that trust, when combined with perceived usefulness, is a very strong predictor of consumer willingness to carry out online transactions, a result that can be easily applied to digital food purchase contexts. Similarly, Pavlou (2003) showed that trust in e-commerce platforms not only increases consumer trust but also their intention to buy health-related products, which points to the rising role of digital trust in the adoption of fortified food.

3. Methodology

This research utilises a theory-building method (Tsiotsou et al., 2022) to create a unified conceptual framework that elucidates consumer acceptance of fortified edible oils. Unlike empirical research or formal systematic literature reviews, theory-building studies aim at amalgamating existing insights to produce new conceptual understandings and theoretical linkages. Besides, such a method is very suitable for research sectors that are nascent and whose scattered findings need to be combined within a comprehensive framework. The paper relies on the recognised elements of theory construction that point to the uncovering of the main concepts or constructs, description of relationships among the variables, and designing a logically consistent explanatory model. Therefore, the aim is not to thoroughly survey every study available but to critically assess and gather relevant materials that will help explain the consumers' choices concerning the adoption of fortified foods.

3.1 Literature Identification and Selection

Key academic databases such as Scopus, Web of Science, and Google Scholar were used to locate the relevant articles through a structured, but not entirely systematic, search in April 2026. The search was done from Jan 2000 to Mar 2025, to cover 25 years and include the earliest as well as the latest studies. The focus of the search was on peer-reviewed journal articles that talked about consumer behaviour, functional foods, food fortification, and health-related decision-making. To get a large yet related group of studies, different keyword combinations like "fortified foods", "functional foods", "consumer behaviour", "health beliefs", "food choice", "digital trust", "edible oil", and "attitude toward food" were used. The inclusion and exclusion criteria are listed in Table 01.

Table 01: Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
1. Peer-reviewed journal articles that were published in the period from 2000 to 2025.	1. Non-peer-reviewed sources (conference, abstracts, reports, blogs).
2. Studies that used or discussed behavioural theories (TPB, HBM, VAB) about food, nutrition, or fortified products.	2. Studies without any theoretical foundation.
3. Research dealing with consumer behaviour, adoption, or purchase intention of fortified foods, functional foods, or dietary supplements.	3. Articles that focus solely on supply-side or technical fortification processes without any analysis of consumer behaviour.

(Source: Author’s own creation)

It is recognised that PRISMA reporting standards were not adhered to, as this paper takes a theory-building approach rather than a formal systematic review. The focus was on conceptual relevance, theoretical completeness, and combining insights rather than a comprehensive coverage of all available studies. This method is consistent with recent methodological recommendations for theory-building reviews (Paul et al., 2021; Tsiotsou et al.,2022).

3.2 Analytical Framework: ADO-TCM Lens

To organise and synthesise the literature, this study uses the Antecedents-Decisions-Outcomes (ADO-TCM) framework as a lens for analysis, instead of a method of research. The ADO-TCM framework helps to systematically classify the variables as antecedents, decision-making factors, and behavioural outcomes; here, TCM stands for Theories, Contexts, Methods, thus making it easier to integrate different theoretical perspectives coherently (Paul et al., 2021).

Practically, theories bring consumer food choice into existing psychological and social mechanisms of behaviour theory. Contexts bring the theory into practice in real-world circumstances, considering ongoing cultural transitions and post-pandemic adaptations, which shape consumer food choices. Methods provide for multiple methods which can identify current gaps and provide a theoretical basis upon which model strategies can be built. Seen in this light, fortified edible oils are more than just nutrition; they are new product forms designed within behavioural, cultural and health ways of change occurring in food systems today.

In this framework, components of TPB, VAB, and HBM are assigned to their appropriate roles. Values-based and health-related elements serve as antecedents; decision-making components include cognitive and social influences, whereas behavioural intention and adoption are the outcomes. This well-defined method provides a better understanding of the concepts and helps create a combined framework and TCM for Theories, Contexts, and Methods.

3.3 Framework Development Process

The framework was built by the iterative curation of insights coming from the chosen literature. Initially, pivotal concepts were extracted from well-known theories and previous studies (Paul et al., 2021). Then, the links between these concepts were explored on the grounds of theory and data. Besides that, other contextual elements, for example, ambivalence and digital trust, were added to the model to unfold new aspects of consumer behaviour. This framework binds the value-driven, belief-driven, and intention-driven viewpoints into one unified model that thoroughly explains consumer decision-making about fortified edible oil adoption.

4. Results and Discussion

The process of developing the theory led to a cohesive conceptual framework (Figure 01, Table 02) that combined the TPB, VAB, and HBM within the ADO-TCM structure (Paul et al., 2021). The next subsections will introduce the framework’s components, develop hypotheses for testing, and highlight the theoretical and practical aspects of this combination.

4.1 Antecedents (A)

The antecedents layer features not only value-driven but also health-related factors that affect consumers’ evaluation of fortified edible oils. As relatively stable value orientations, health consciousness and cultural food beliefs, based on the VAB system, are cognitive elements established a long time ago that directly and indirectly influence consumers’ perception and consumption preferences of certain food products (Homer & Kahle, 1988; Steptoe et al., 1995). Reflected in the decision process of attitude formation, these two antecedents can automatically guide consumers to evaluate the relevance and acceptability of fortified foods in a certain way and cultural context. Besides that, HBM includes other health-related elements, such as perceived benefits and perceived barriers (Rosenstock, 1974; Janz & Becker, 1984). For consumer attitudes towards fortified edible oils, perceived benefits refer to consumers’ cognition of fortification as a nutritional supplement that potentially benefits individual health, while perceived barriers involve taste safety,

naturalness and price issues (Mahmudiono et al., 2022; Nazzaro et al., 2024).

4.2 Decision-Making Process (D)

The decision-making stage has a strong empirical basis in the TPB (Ajzen, 1991; Armitage & Conner, 2001); a structure for investigating consumer attitudes and decision-making models. The TPB is a widely applied psychological theory that suggests an individual's behavioural intention is a direct result of their evaluation of the behaviour, perceived social pressure, subjective norm, and perceived manageability, referred to as perceived behavioural control (Ajzen, 1991). For behaviours towards purchasing fortified edible oils, attitude serves as an underlying mediating effect, linking cognitive evaluations of the company's safety, health, and nutritional reputation with affective reactions, taste perceptions, and acceptance (Satyapriya et al., 2021). However, consumers may experience psychological ambivalence arising from conflicting evaluations regarding the health benefits, artificiality, and flavour of fortified edible oils, which may weaken the relationship between positive attitudes and behavioural intention and thereby function as an intervening factor within the TPB decision-making model (Priester & Petty, 1996, 2001; Barsyte & Fennis, 2023).

The subjective norm reflects the influence of non-motivated social referents (family, peers and physicians) who are critical opinion leaders in collectivist countries, and the degree of influence they carry (Ajzen, 1991; Natarajan et al., 2022; Solomon, 2018). Perceived behavioural control reflects the influence of consumers' perceptions on the convenience, accessibility, and affordability of fortified edible oils, as well as on the individual's ability to perform these innovation adoption behaviours (Ajzen, 1991; Armitage & Conner, 2001; Asmithaa et al., 2025). The three components determine behavioural intention, which is pre-existing to the actual purchase behaviour.

Research works support the TPB-centred decision layer in the adoption of fortified foods. For example, Natarajan et al., (2022) showed that subjective norms influence the extent to which media affects purchase intention of functional beverages, thus highlighting the power of social referents in consumption related to health. In the same way, Asmithaa et al., (2025) revealed that awareness, affordability, and perceived barriers were the factors that significantly influenced the use of multi-source fortified edible oils, thereby stressing the significance of perceived behavioural control in developing markets. Besides that, Satyapriya et al., (2021) used TPB in the case of fortified food adoption in Delhi and found that health benefits, attitudes and cultural food beliefs were the most significant factors determining behavioural intention. In sum, the above research has illustrated

that the decision-making process for food fortification adoption, beyond attitudes, is also deeply influenced by social and contextual factors.

4.3 Outcomes (O)

Within the ADO-TCM framework, purchasing intention becomes the main outcome variable, reflecting a person's likelihood of using fortified edible oils. Behavioural theory always locates intention as the near and most trustworthy indicator of actual behaviour, therefore explaining the connection between attitudes, norms and consumption practices. In the area of fortified food, results may be expressed as purchase intention, willingness to pay, and adoption behaviour, each revealing different aspects of consumer acceptance. Research papers exemplify this result dimension quite transparently. Satyapriya et al., (2021) discovered that attitudes toward health benefits and cultural food beliefs strongly influenced the purchase intentions of Delhi consumers of fortified foods, thus supporting the notion that intention precedes adoption. Likewise, Asmithaa et al., (2025) found that the combination of affordability, awareness, and perceived difficulties determined consumers' willingness to purchase multi-source fortified edible oils, thereby highlighting how behavioural intention can lead to actual use when surrounding constraints are addressed. Also, in a different context, Natarajan et al., (2022) showed that subjective norms and media exposure influenced purchase intentions for functional beverages, thereby strengthening the view that intention is not only attitudinal but also deeply socially embedded. Altogether, these results highlight purchase intention as the main outcome variable, being the best predictor of fortified food adoption across different cultural and market settings.

4.4 Theories (T)

The theoretical basis of this framework lies in three behavioural models that are universally acknowledged: TPB, HBM, and VAB model. TPB clarifies the extent to which behavioural intentions are influenced by attitudes, subjective norms, and perceived behavioural control (Ajzen, 1991; Armitage & Conner, 2001). HBM draws attention to how perceptions of one's own susceptibility severity, and the benefits and barriers to preventive health behaviour, determine whether one will engage in preventive health behaviour (Rosenstock, 1974; Janz & Becker, 1984). VAB emphasises the importance of values, which continue to play a key role in shaping attitudes that, in turn, lead to specific behaviours (Homer & Kahle, 1988; Grunert, 2010). Studies on fortified foods and functional beverages have shown that these theories are still very much part of the relevant theoretical apparatus: Satyapriya et al. (2021) used TPB to study the behaviour of fortified food consumers in Delhi; Mahmudiono et al., (2022) through supplement intake during COVID-19

situation proved the appropriateness of HBM constructs; and Vermeir & Verbeke (2006) evidenced that sustainability values are an important factor in the selection of organic and functional foods. All in all, these theories form a solid base for understanding consumer acceptance of fortified edible oils.

4.5 Context (C)

Context places consumer behaviour in the frame of cultural norms and digital information environments. In India, collectivist traditions and family-centred food practices are major factors influencing the uptake of fortified oils (Solomon, 2018; Shamsudin et al., 2022). Evidence from multiple countries also reveals the cultural impact of behaviour change: Doan et al., (2024) pointed out the use of cultural food habits in the fortification campaign in Vietnam and the role of health communication strategies at the national level, while Alqaydi et al., (2024) underlined the rising significance of digital trust in Gulf cooperation council (GCC countries), to the extent that the credibility of online health information directly impacts consumer attitudes. Also, Sunstein (2017) shed light on social norms and informational cascades that may increase or decrease adoption decisions, demonstrating that consumption of fortified foods is not only an individual matter but also socially rooted. It follows that cultural and digital milieus combined explain consumer perceptions of fortified oils, and that cross-country cooperative work in nutrition policy and digital health communication can lead to better adoption.

4.6 Methods (M)

Methodological approaches in the field of fortified food adoption research have mainly been survey-based, cross-sectional designs using self-reported indicators (Armitage & Conner, 2001; Kotler & Keller, 2008; Asmithaa et al., 2025; Nazzaro et al., 2024). Though such methods provide a good picture of the situation, they are usually not sufficiently deep (experimental or longitudinal) to allow us to make strong causal hypotheses (Laureati et al., 2024; Toorani et al., 2024; Tsiotsou et al., 2022; Paul et al. 2021). Analysing demographic segments (age, gender, education, and income) has been a common practice to justify differences in the acceptance of fortified foods (Engel et al., 1986; Asmithaa et al., 2025; Nazzaro et al., 2024). Asmithaa et al., (2025), for instance, have used structured questionnaires to identify affordability constraints and lack of awareness as the main factors hindering the adoption of fortified oil, whereas Nazzaro et al. (2024) conducted consumer questionnaires to assess European consumers’ willingness to pay for fortified foods. In-depth methodological advice, for example, from Tsiotsou et al., (2022), points toward theory-building reviews and integrative frameworks (ADO-TCM) to address the disjointedness in new areas of study (Paul et al., 2021). Hence, although methods based on surveys are prevalent, future research should employ mixed-methods, longitudinal tracking, and digital analytics to monitor changes in consumer behaviour in the use of fortified foods (Laureati et al., 2024; Tsiotsou et al., 2022).

Table 02: Summary of ADO-TCM-based findings on fortified edible oil adoption

ADO-TCM	Constructs/ Theory		Description	Key References
A (Antecedents)	Health Consciousness (VAB)		Stable personal value orientation that influences individual consumers’ health and wellness assessment of food selection, and consumers’ attitude toward consumption of fortified products	Homer & Kahle (1988); Steptoe et al., (1995); Asmithaa et al.,(2025)
	Cultural Food Beliefs (VAB)		Deep cultural norms, customs, and traditions about food choice involve cultural intermediaries that influence how consumers evaluate the acceptability of fortified edible oils.	Homer & Kahle (1988); Vermeir & Verbeke (2006); Satyapriya et al., (2021)
	Perceived (HBM)	Benefits	The belief that eating fortified edible oils will benefit health (e.g., vitamin A, vitamin D) increases a positive attitude.	Rosenstock (1974); Janz & Becker (1984); Mahmudiono et al., (2022); Chaurasia et al., (2025)
	Perceived (HBM)	Barriers	Consumers’ negative perceptions of taste change, safety, naturalness, and price hinder buying attitudes and the adoption of fortified edible oils.	Rosenstock(1974); Asmithaa et al., (2025); Nazzaro et al.,(2024)

D (Decisions)	Attitude (TPB/VAB/HBM)	The context mediating variable linking cognitive (perceived health benefits; perceived safety) and affective response (taste, sensory appeal) to purchase intention.	Ajzen (1991); Armitage & Conner (2001); Satyapriya et al., (2021)
	Ambivalence	Ambivalence between conflicting attitudes towards the health benefits, artificiality, and flavour of fortified edible oils can weaken attitude-behavioural intention links in the TPB structure.	Priester & Petty (1996, 2001); Barsyte & Fennis (2023)
	Subjective Norms (TPB)	The social influence of family members, friends, and health professionals on consumers' behavioural intention toward fortified oils, particularly in collectivist cultures.	Ajzen (1991); Natarajan et al., (2022); Solomon (2018)
	Perceived Behavioural Control (TPB)	Consumer perceptions about the availability, affordability, and convenience of using fortified edible oils, along with attitudes and norms, influence the probability of adopting the product.	Ajzen (1991); Armitage & Conner (2001); Asmithaa et al., (2025)
O (Outcomes)	Purchase Intention	Dependent variable measuring consumer-reported likelihood of buying fortified edible oils; can be a proxy for willingness to pay and acceptance behaviour.	Satyapriya et al., (2021); Asmithaa et al., (2025); Natarajan et al., (2022)
T (Theories)	TPB, VAB, HBM	Three theories of behaviour and decision-making are presented, covering intention-driven (TPB), value-driven (VAB), and belief-driven (HBM)	Ajzen (1991); Homer & Kahle (1988); Rosenstock (1974); Mahmudiono et al., (2022); Vermeir & Verbeke (2006); Paul et al., (2021)
C (Context)	Cultural and Digital Context	The influence of family- and community-oriented food purchasing practices, digital information worlds, and cultural logics of collectivity.	Solomon (2018); Doan et al., (2024); Alqaydi et al., (2024); Sunstein (2017); Shamsudin et al., (2022)
M (Methods)	Demographic Factors	Age, gender, educational level, and income were entered as control variables to account for variation in acceptance of fortified foods across the consumer segments.	Engel et al. (1986); Asmithaa et al., (2025); Nazzaro et al., (2024)
	Survey-Based Approaches	Predominant use of self-reported, cross-sectional questionnaire designs to measure attitudes, norms, perceived control, and purchase intention for fortified food products. Self-reports and cross-sectional questionnaire studies were predominantly used to measure attitudes, norms, perceived control, and intent to purchase fortified foods.	Armitage & Conner (2001); Kotler & Keller (2008); Asmithaa et al., (2025); Nazzaro et al., (2024)

Methodological Limitations	Without experimental or longitudinal designs, it is not possible to make causal inferences. Future studies should combine mixed-methods, digital analytics, and panel data to support stronger conclusions.	Laureati et al., (2024); Toorani et al.,(2024); Tsiotsou et al., (2022); Paul et al., (2021)
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(Source: Author’s own creation)

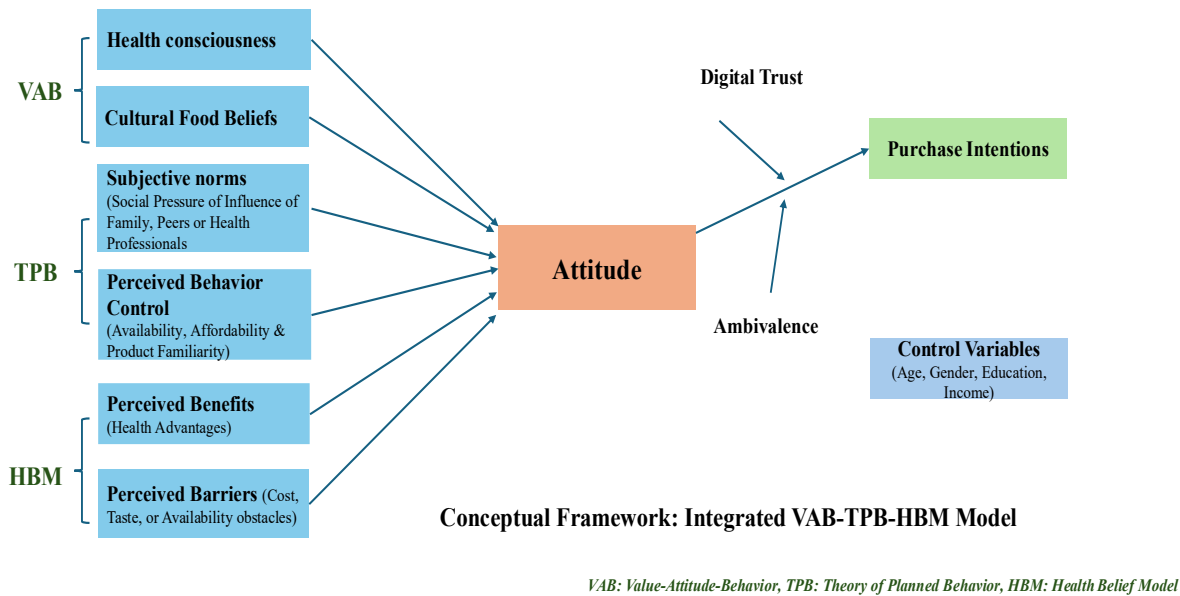


Figure 1: Proposed conceptual framework for fortified edible oil adoption
(Source: Author’s own creation)

4.7 Research Propositions Derived from the Framework

By combining TPB, VAB, and HBM within an integrated framework, this paper presents the research propositions (Table 03). Attitude toward fortified edible oils is influenced by health consciousness and cultural food beliefs (VAB), as well as by perceived benefits and barriers (HBM). Subjective norms and perceived behavioural control (TPB) influence not only attitude but also purchase intention. Attitude is a predictor of purchase intention, and ambivalence and digital trust moderate this relationship. Demographic variables (age, gender, education, income) are used as control variables (Figure 01). In line with the norms of conceptualising and theory-building, these are not formally tested hypotheses but rather propositions intended as statements that can be tested through future empirical research.

Table: 03 Research propositions

Conceptual Element	Research propositions
Attitude Formation	P1: Health consciousness positively affects consumer attitudes toward fortified edible oils.
	P2: Cultural food beliefs will contribute to a positive consumer attitude towards the fortification of edible oils.
	P3: Perceived benefits positively influence consumers’ attitudes towards the use of fortified edible oils.
	P4: Perceived barriers negatively affect consumer attitudes towards fortified edible oils.

Decision-Making Processes	P5: Attitude will exert a direct positive influence on the purchase intention of fortified edible oils. P6: Subjective norms will make purchase intention lean towards fortified edible oils. P7: Perceived behavioural control will have a positive effect on purchase intention towards fortified edible oils.
Mediation Effects	P8: Attitude is a mediator of the effect of health consciousness and cultural food beliefs (VAB) on purchase intention. P9: Attitude is a mediator of the effect of subjective norms and perceived behaviour control (TPB) on purchase intention. P10: Attitude is a mediator of the effect of perceived benefits and perceived barriers (HBM) on purchase intention
Moderation Effects	P11: Ambivalence moderates the link between attitude and purchase intention, so that the association between the two is attenuated for the most ambivalent consumers. P12: Digital trust moderates the link between attitude and purchase intention, so that the association between the two is intensified for the most trusting consumers.
Control Variables	Demographic factors (age, gender, education, and income) are control variables, as each may independently influence purchase intention.

(Source: Author's own creation)

5 Discussions

5.1 Theoretical Contributions

This research contributes to existing knowledge on the consumption of fortified edible oils by deepening understanding of the multidimensional nature of food purchase decisions for these products. Previous studies focused on some theoretical innovations like the TPB, HBM, or technology-based acceptance models, all of which only explain some elements of the consumer behaviour in the purchase of fortified edibles but do not illuminate the entire interactive process of consumers' value, health feelings, affective judgments, social-related factors and trust-specific factors during food choice in the modern environment. Our current structure overcomes this restriction by synthesising value-oriented, belief-oriented, and behaviour-intention-based conceptualisations of the purchase that influence consumers' assessments of fortified edible oils. This integrated approach assists us in understanding how consumers consider a product comprehensively, including functional health attributes, perceived credibility, consumers' response, social acceptance and the digital information environment. This holistic outlook is vital in the sense of talking about the fortified foods, where nutritional awareness, product scepticism, habituality of consumption, implantation of trust in manufacturers, and the internet information environment would collectively propel purchase. The critical conceptual model was embedded with the variables such as ambivalence and digital trust on the demand of consumption behaviour of fortified foods and offered the researcher a more situational-based hypothesis of consumption of fortified foods. Consumers feel both inclined and reticent about taking in fortified edible oil when these service populations have doubts. That

is the essence of the difference that contributes to eco-labels of fortified edible oils, in which consumers might be aware of nutritional merits of fortified edible oils but circumspect of quality or relevance.

5.2 Managerial and Policy Implications

The recommended conceptual model also has several implications for decision-makers, marketers and health interests participating in food fortification programs. The full potential of any given program cannot be reached without focused regulatory enforcement and will not be immediately answered by consumers of fortified products. Consumers-oriented should be the basis for policy makers to back up their regulation on messaging communications about emphasizing the safety, necessity and upkeep the traditional cooking when food fortification was introduced (Rosenstock, 1974). Simultaneously, public awareness campaigns should advertise that fortification is a preventative health policy and intends to avoid the misconceptions about its inimical effects on taste and naturalness. Under the control of the promotion of the production and uses of Spreading of false information and promoting the dissemination of scientifically proven health claims are Necessary steps towards securing the trust of consumers. Since, on top of many other factors, the biggest one contributing to consumers' turn to online for health-care: In information is the question of trust. In the digital system, digital trust has become an extremely significant factor Sunstein (2017). Besides those given to marketers' regulators are also in charge of making sure that information is presented in all ways to provide clear and correct knowledge. Aggregates

online, in the various online environments (websites, e-commerce platforms and social media) there will be no deception Practices that will favor consumers.

5.3 Limitations of the Study

Despite its contributions, conceptual research studies generally face some limitations. Firstly, the conceptual framework is not empirically tested, and its explanatory power is still at the theoretical level. To assess the model's generalizability, empirical validation across various consumer segments is essential. Secondly, the model is primarily focused on cognitive and affective factors of acceptance and thus does not explicitly include sensory evaluation or price elasticity, which may influence the choice of edible oils. Thirdly, even though the framework is established in the Indian context, the country's cultural heterogeneity may raise doubts about the applicability of uniform conclusions.

6. Conclusion

India's consumer markets see fortified edible oils as a strategic instrument. However, this role involves behavioural complexity. Their success, therefore, is not only dependent on technological feasibility and regulatory support but also on consumer acceptance, which is influenced by values, beliefs, emotions, and trust. This research, by integrating TPB, VAB, and HBM and including ambivalence and digital trust, reveals a holistic conceptual framework that theoretically and practically contributes to existing knowledge. Above all, the framework suggests that promoting fortified edible oils should not be the sole focus of raising the public's knowledge about these foods; it requires appropriate communication aligned with the community's culture, strategies to build people's trust, and intentional efforts to reduce indecision. Therefore, this study lays a solid basis for the analytical investigations to come and provides several practical guidelines to decision-makers and frontline workers in fortification, likely to make these programs more effective.

Ethics Statement

No persons, personal data collection or experimental interventions were part of this research, so ethics approval was not necessary.

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