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Psychological, Cultural, and Structural Barriers to Health Drink Consumption in Emerging Markets: An Integrated TPB–Stages of Change Framework

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ABSTRACT

The market for fortified and functional beverages has expanded rapidly in emerging economies, particularly in India, where increasing health awareness and aggressive marketing by fast-moving consumer goods (FMCG) firms have contributed to category growth. Despite market expansion, consistent consumption of health drinks remains uneven across socio-economic and geographic segments. Prior studies have examined the Theory of Planned Behavior (TPB) and the Stages of Change (SoC) model independently; however, their integrated application in emerging market FMCG contexts remains limited, representing a critical gap in the consumer behavior literature. This study examines psychological, cultural, and structural barriers influencing health drink consumption among Indian consumers by integrating TPB with the SoC model. A structured survey was administered to 450 respondents from urban Bengaluru and rural regions of Karnataka, selected through stratified random sampling. Structural Equation Modeling (SEM) with confirmatory factor analysis (CFA) was employed to examine relationships among attitudes, subjective norms, perceived behavioral control (PBC), behavioral intention, and consumption behavior. Convergent and discriminant validity were established through average variance extracted (AVE) and composite reliability (CR) values. Findings indicate that attitudes ($\beta = 0.42$, $p < 0.001$), PBC ($\beta = 0.31$, $p < 0.001$), and subjective norms ($\beta = 0.25$, $p < 0.001$) meaningfully shape behavioral intention, with the model explaining 58% of variance in consumption behavior ($R^2 = 0.58$; R^2 for Behavioral Intention = 0.52). Stage analysis reveals that nearly 70% of consumers remain in early behavioral stages, highlighting limited readiness for regular health drink consumption. Cultural preference for traditional beverages, affordability constraints, taste perceptions, and low perceived necessity emerge as major barriers. The study contributes to consumer behaviour literature by demonstrating the complementary explanatory power of intention-based and stage-based behavioural models in understanding health-related consumption in emerging markets. Managerial and public policy implications for promoting healthier beverage consumption are discussed..

Keywords: Theory of Planned Behaviour; Stages of Change; health drinks; functional beverages; Indian consumers; consumer behaviour; emerging markets; FMCG; structural equation modelling..

INTRODUCTION

Growing awareness of preventive healthcare, nutrition, and lifestyle diseases has significantly influenced global food consumption patterns (Siegrist, 2008; Grunert, 2010). Consumers increasingly seek products that provide benefits beyond basic nutrition, leading to the rapid expansion of functional food and beverage markets worldwide (Verbeke, 2005; Urala & Lahteenmaki, 2007). Functional beverages represent one of the fastest-growing segments within the global food and beverage industry, marketed for enhanced nutritional benefits such as vitamins, minerals, probiotics, and protein supplementation (Annunziata & Vecchio, 2013).

In India, the health drink category—comprising malt-based fortified beverages such as Horlicks, Bournvita, Boost, and Complan—has emerged as an important segment within the FMCG sector. The Indian health drink market is estimated at approximately USD 1.8 billion and has experienced sustained double-digit growth, driven by urbanization, rising disposable incomes, and increasing parental concern regarding child nutrition (Nielsen India, 2024; FICCI, 2025). The WHO (2020) has identified dietary diversification and micronutrient adequacy as key pillars of population health in developing nations, further

legitimizing the role of fortified beverages in public health discourse.

Despite this growth, consumption patterns remain inconsistent across demographic segments. Urban middle-class households often incorporate health drinks into daily dietary routines, whereas adoption levels remain considerably lower in rural and semi-urban markets. Even among urban consumers, consumption frequently occurs sporadically rather than as a habitual dietary practice. Several contextual factors may explain these patterns. Traditional beverages such as buttermilk, ragi malt, turmeric milk, and herbal decoctions continue to play an important role in Indian dietary culture, widely perceived as natural, economical, and nutritionally adequate alternatives to commercially marketed health drinks. Furthermore, price sensitivity, skepticism toward processed foods, and varying levels of health literacy influence consumer attitudes toward fortified beverages (Kumar & Singh, 2023).

Understanding these behavioral dynamics requires theoretical frameworks capable of explaining both psychological determinants of consumer intentions and the process through which individuals adopt new consumption habits. Despite a growing body of literature on TPB in food behavior contexts (Armitage & Conner, 2001; Bashir, Mahmood, & Hassan, 2022), no study has integrated the Stages of Change model to examine health drink barriers specifically in the Indian FMCG context. This represents a meaningful theoretical and empirical gap.

To our knowledge, this is the first study to empirically integrate TPB and the Stages of Change model within the Indian health drink category—an emerging market context where both motivational and readiness-based barriers operate simultaneously. This study therefore addresses three research questions:

RQ1: What psychological, cultural, and structural factors influence behavioral intention toward health drink consumption among Indian consumers?

RQ2: To what extent does behavioral intention predict actual health drink consumption behavior?

RQ3: How does readiness stage (as conceptualized in the SoC model) distribute across the sample, and what are its implications for adoption?

The study pursues three objectives: (1) to examine the predictive validity of the TPB constructs—attitude, subjective norms, and perceived behavioral control—in the context of health drink consumption; (2) to integrate the Stages of Change model to assess behavioral readiness among

Indian consumers; and (3) to derive managerial and policy implications for promoting healthier beverage consumption in emerging markets.

The remainder of this paper is organized as follows. Section 2 reviews the theoretical and empirical literature. Section 3 presents the conceptual model and hypotheses. Section 4 describes the research methodology. Section 5 reports the results. Section 6 provides a discussion of findings. Section 7 outlines managerial and policy implications. Section 8 acknowledges limitations and directions for future research, followed by the conclusion and references.

LITERATURE REVIEW

Functional Foods and Consumer Adoption

Functional foods are distinguished from conventional products by their capacity to confer specific physiological benefits that go beyond meeting basic nutritional needs (Verbeke, 2005). Increasing consumer awareness of preventive healthcare has stimulated demand for such products globally, with the functional food and beverage market expected to exceed USD 300 billion by 2026 (Grand View Research, 2023). Research consistently identifies perceived health benefits, product credibility, taste expectations, price sensitivity, and trust in health claims as key drivers of functional food adoption (Annunziata & Vecchio, 2013; Urala & Lahteenmaki, 2007).

Cultural food practices also shape consumer acceptance in complex ways. In many emerging markets, traditional diets coexist with modern processed foods, resulting in hybrid consumption patterns (Grunert, 2010). Consumers in these markets often exhibit ambivalence: while they acknowledge the health benefits of fortified products, they may simultaneously prefer traditional alternatives perceived as more natural and culturally congruent (Hoek et al., 2017). This tension between modernity and tradition is particularly pronounced in the Indian context, where culinary heritage is deeply embedded in daily life.

Prior studies in India have examined functional food adoption among specific demographic groups, including mothers purchasing for children (Misra & Singh, 2021) and health-conscious urban professionals (Sharma & Tiwari, 2020). These studies broadly confirm the influence of health consciousness, product familiarity, and social influence, yet they rarely employ integrated theoretical frameworks or account for rural-urban differences in a single study design

Theory of Planned Behavior

The Theory of Planned Behavior (Ajzen, 1991) positions intention as the most proximal driver of actual behavior. Three psychological constructs shape this intention: how favorably an individual evaluates the behavior in question (attitude), the degree to which important people in one's life are perceived to approve or disapprove of it (subjective norms), and one's confidence in being able to perform the behavior given real-world constraints (perceived behavioral control, PBC). TPB ranks among the most extensively validated frameworks in health behavior research, with meta-analyses affirming its strong predictive record across diverse behavioral domains (Armitage & Conner, 2001; McEachan et al., 2011).

Attitude refers to an individual's positive or negative evaluation of performing a specific behavior. In health drink contexts, attitudes are shaped by beliefs regarding taste, nutritional value, perceived health benefits, and concerns about artificial additives or sugar content (Verbeke, 2005). Studies in emerging markets report that consumer attitudes toward fortified beverages are often

ambivalent, reflecting tension between health aspirations and skepticism about commercially processed products (Kumar & Singh, 2023).

Subjective norms capture the motivational weight that an individual assigns to the opinions of key social actors—family members, peers, healthcare professionals, and community figures—regarding whether a behavior should be performed (Ajzen, 1991). In the Indian context, family endorsement—particularly from mothers and grandparents—plays a disproportionately important role in dietary decisions, especially for products marketed for children (Misra & Singh, 2021). Healthcare professionals, including pediatricians, also exert substantial normative influence on health drink adoption.

PBC reflects how easy or difficult a person believes it will be to carry out the behavior, incorporating both personal capabilities such as knowledge and confidence, and situational factors including product affordability and physical accessibility (Ajzen, 2002). In rural markets, PBC is often constrained by limited retail infrastructure, lower health literacy, and budget limitations. PBC has been found to exert both direct and indirect effects on behavior, particularly when volitional control is imperfect (Armitage & Conner, 2001).

Recent applications of TPB in food and beverage research include studies on organic food purchase (Teng & Wang, 2015), plant-based protein adoption (Graça et al., 2019), and dietary

supplementation (Bashir et al., 2022). Across these studies, attitude consistently emerges as the strongest predictor of intention, followed by subjective norms and PBC, though the relative weights vary by cultural context and product category.

Stages of Change Model

The Transtheoretical Model's Stages of Change (SoC) framework (Prochaska & DiClemente, 1983) maps behavioral adoption as a graduated, non-linear progression across five distinct stages. In Pre-contemplation, individuals have not yet recognized a reason to change. In Contemplation, individuals begin to weigh the pros and cons of change but have not yet committed to action. Preparation represents a transition point where consumers take initial concrete steps toward adoption. Action captures the period of active behavioral engagement, while Maintenance denotes the point at which the new behavior has been sustained long enough to become a settled routine.

Beyond its clinical origins, the SoC model has demonstrated utility across a broad range of health behaviors, including eating pattern modification, tobacco cessation, exercise uptake, and preventive screening behaviors (Prochaska et al., 1994; Spencer et al., 2006; Noroozi et al., 2017). In dietary contexts, the model has proven particularly useful for segmenting populations and tailoring interventions to stage-appropriate communication strategies.

In the food marketing literature, stage-based segmentation has been used to differentiate consumers at various points of readiness to adopt functional foods (Brug et al., 2005).

Consumers in pre-contemplation and contemplation stages are typically characterized by low awareness, skepticism, or perceived low relevance, whereas those in action and maintenance stages demonstrate established consumption routines. A notable limitation of the SoC model in non-clinical contexts is the assumption of unidirectional stage progression, whereas consumer behavior often exhibits cyclical or regressive patterns (Whitelaw et al., 2000).

Integration of TPB and the Stages of Change Model

While TPB elucidates the cognitive-motivational antecedents of behavioral intention, it does not explicitly capture differences in individuals' readiness to act on those intentions. Conversely, while SoC provides a temporal map of behavior change, it does not fully explain the psychological mechanisms driving stage transitions. Integrating these frameworks addresses the limitations of each model independently

Greene et al. (1999) demonstrated that TPB constructs vary systematically across SoC stages in dietary fat reduction behavior, with attitudes and PBC being markedly stronger among individuals in action and maintenance stages. Similarly, Hagler et al. (2007) found that intention strength in TPB was a reliable indicator of stage placement in physical activity contexts. These findings suggest that the two frameworks are theoretically complementary rather than redundant.

Despite the theoretical promise of this integration, its application in consumer behavior research—particularly in the context of functional beverage adoption in emerging markets—remains limited. Studies examining health drink consumption in India have predominantly relied on single-framework approaches (Misra & Singh, 2021; Sharma & Tiwari, 2020), without capturing the behavioral readiness dimension that SoC offers. This study addresses this gap by explicitly integrating TPB and SoC to provide a richer, more diagnostically useful account of consumer decision-making in the health drink category.

Consumer Behavior in the Indian FMCG Market

India ranks among the world's fastest-growing FMCG markets, with a projected value exceeding USD 220 billion by 2025 (FICCI, 2025). The Indian consumer base is highly heterogeneous, spanning diverse income levels, geographic regions, cultural groups, and generational cohorts. Understanding purchase behavior in this context demands attention to macro-structural factors—income distribution, retail infrastructure, and digital access—as well as micro-psychological drivers such as values, beliefs, and social influences.

The FMCG health and wellness segment has experienced particular dynamism, driven by post-COVID health consciousness, government nutrition initiatives, and digital health information dissemination (IMRB Consumer Health Survey, 2023). However, within this segment, health drink adoption remains uneven. Rural penetration of branded health beverages remains low, partly due to pricing, partly due to distribution gaps, and partly due to the strong cultural currency of traditional home-prepared beverages. These dynamics necessitate

context-sensitive theoretical frameworks capable of capturing both motivational and structural barriers.

Cultural Influences on Food Consumption in India

Culture exerts a pervasive influence on food choice, preparation, and consumption patterns. In India, food is not merely a nutritional commodity but a deeply embedded social and cultural

practice, shaped by religion, region, caste, seasonality, and family tradition (Srinivas, 2006). Traditional beverages such as buttermilk (chaas), ragi malt (ragi ambali), turmeric milk (haldi doodh), and various herbal decoctions (kadha) occupy an important place in Indian dietary culture, particularly in South Indian states such as Karnataka and Tamil Nadu (Rathi et al., 2018).

These beverages are perceived as natural, trustworthy, and culturally congruent—attributes that commercially marketed health drinks may struggle to replicate. Research on traditional food neophobia suggests that consumers in culturally conservative dietary environments may exhibit resistance to processed or packaged alternatives, particularly when traditional options are perceived as superior in health or symbolic value (Hartmann & Siegrist, 2017). For health drink manufacturers, this cultural landscape represents a pronounced adoption barrier that marketing communication must explicitly address.

Research Gap and Theoretical Contribution

The preceding review identifies several gaps in the existing literature. First, most TPB applications in the health drink domain have been conducted in Western contexts, with limited adaptation to the cultural specificities of Indian consumers. Second, stage-based analyses of health beverage adoption are rare in the Indian FMCG literature, leaving unclear how behavioral readiness is distributed across the population. Third, the integration of TPB and SoC—while theoretically advocated—has not been empirically tested in the context of health drink consumption in any emerging market setting.

This study contributes to the literature in three ways: (1) it provides the first empirical test of an integrated TPB-SoC framework in the Indian health drink context; (2) it incorporates both urban and rural samples to capture distributional heterogeneity; and (3) it identifies the specific psychological, cultural, and structural barriers that inhibit adoption across stages of readiness.

Table 1: Key Prior Studies on TPB and Functional Food/Beverage Consumption

Authors (Year)	Context	Framework	Key Findings
Armitage & Conner (2001)	Meta-analysis, Health	TPB	Attitude strongest predictor; PBC adds unique variance beyond intention
Authors (Year)	**Context**	**Framework**	**Key Findings**
Greene et al. (1999)	Dietary fat reduction, USA	TPB + SoC	TPB constructs vary across SoC stages; integration improves prediction
Urala & Lahteenmaki (2007)	Functional foods, Finland	Attitude-based	Reward of use and safety most salient attitude dimensions
Noroozi et al. (2017)	Dietary behavior, Iran	SoC	Stage distribution predicts intervention responsiveness
Bashir et al. (2022)	Supplements, Pakistan	TPB	Subjective norms dominant in collectivist context
Kumar & Singh (2023)	FMCG, India	Mixed methods	Price sensitivity and cultural preferences as key barriers

Misra & Singh (2021)	Health drinks, India	TPB (partial)	Family influence significant for child-targeted products
Sharma & Tiwari (2020)	Functional foods, India	TPB	Health consciousness mediates attitude-intention link

Conceptual Model and Hypotheses

\Conceptual Model

The integrated conceptual model draws on the theoretical structures of both TPB and the Stages of Change model. In the primary TPB pathway, attitude, subjective norms, and perceived behavioral control are proposed to predict behavioral intention, which in turn predicts consumption behavior. Following Armitage and Conner (2001), PBC is also modeled as a direct predictor of behavior, capturing the component of PBC that operates independent of intention (i.e., actual control over behavior). The Stages of Change variable is incorporated as a theoretically grounded..

moderator of the TPB pathways, consistent with the integration framework proposed by Greene et al. (1999).

The conceptual framework presented in Figure 1 illustrates the integrated theoretical model underpinning this study, combining the Theory of Planned Behavior (Ajzen, 1991) and the Stages of Change model (Prochaska & DiClemente, 1983) to explain barriers to health drink consumption among Indian consumers.

The framework is structured along three sequential layers. The left panel represents the three antecedent constructs of the TPB: Attitude, Subjective Norms, and Perceived Behavioral Control (PBC).

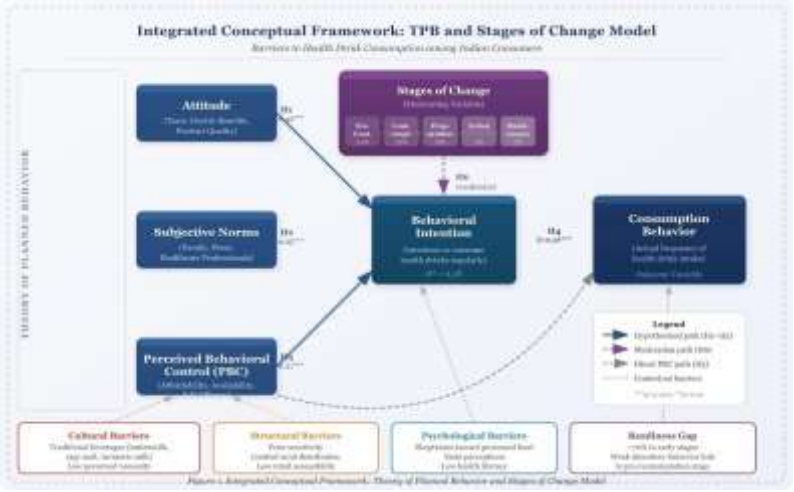

Figure 1: Conceptual Model

Hypotheses

The following hypotheses are derived from the theoretical framework and empirical literature:

H1: Attitude positively influences behavioral intention toward health drink consumption.

Consistent with the TPB and prior food behavior research (Armitage & Conner, 2001; Sharma & Tiwari, 2020), a positive attitude toward health drinks—shaped by beliefs about taste, health benefits, and product quality—is expected to enhance intention to consume.

H2: Subjective norms positively influence behavioral intention.

In collectivist cultural contexts such as India, social referents including family members, peers, and healthcare professionals exert considerable normative pressure on dietary behavior (Bashir et al., 2022; Misra & Singh, 2021).

H3: Perceived behavioral control positively influences behavioral intention.

PBC, reflecting perceived affordability, accessibility, and self-efficacy, is expected to shape intention toward health drink consumption, particularly in price-sensitive segments (Kumar & Singh, 2023).

H4: Behavioral intention positively influences consumption behavior.

TPB posits that intention is the most proximal predictor of behavior (Ajzen, 1991). This relationship is expected to hold in the health drink context, subject to moderation by behavioral readiness stage.

H5: Perceived behavioral control directly and positively influences consumption behavior.

PBC may exert a direct effect on behavior independent of intention when actual control constraints (e.g., affordability, availability) are operative (Armitage & Conner, 2001).

H6: Stage of Change moderates the relationships between TPB constructs and consumption behavior, such that the relationships are stronger for individuals in advanced stages.

Following Greene et al. (1999), individuals in later SoC stages (Preparation, Action, Maintenance) are expected to exhibit stronger attitude-intention and intention-behavior relationships than those in earlier stages (Pre-contemplation, Contemplation).

RESEARCH METHODOLOGY

Research Design

A quantitative design was adopted. A cross-sectional design was selected as it allows simultaneous measurement of all study constructs and is well-suited to theory-testing research where temporal precedence is established theoretically rather than experimentally (Hair et al., 2019). This study received ethics approval from the institutional review board prior to data collection, and all respondents provided informed consent. Participation was voluntary and anonymous.

Sample and Sampling Procedure

We targeted adult consumers (aged 18 and above) residing in urban Bengaluru and rural districts of Karnataka. A stratified random sampling approach was employed to ensure proportional representation of urban-rural segments, gender, age groups, and income strata. Urban respondents were recruited from residential areas in Bengaluru across three income zones (lower-middle, middle, upper-middle). Rural respondents were recruited from villages in Tumkur, Mysuru, and Mandya districts, which represent diverse agro-economic contexts in Karnataka.

Sample size was determined using power analysis with G*Power 3.1 (Faul et al., 2009). For SEM with a hypothesized model of six latent constructs and 20 observed indicators, a minimum sample of 350 was required to achieve 80% statistical power at $\alpha = 0.05$ (Cohen, 1992). A final sample of

450 was targeted to account for anticipated response attrition and to support subgroup comparisons.

A pilot study was conducted with 40 respondents (20 urban, 20 rural) prior to the main survey. Pilot analysis confirmed adequate internal consistency across all constructs (Cronbach's $\alpha > 0.75$) and face validity of item wording. Minor revisions were made to two questionnaire items following pilot feedback.

Measurement Instrument

All constructs were measured using established scales adapted to the Indian health drink context. Items were presented on a seven-point Likert scale (1 = Strongly Disagree; 5 = Strongly Agree). Table 2 summarizes the construct operationalization. The Stage of Change was assessed using a validated single-item staging algorithm adapted from Prochaska and DiClemente (1983) for the

dietary behavior context. Respondents were classified into one of five stages based on their self-reported current and intended consumption behavior, following the classification criteria established in prior dietary SoC research (Noroozi et al., 2017).

Table 2: Construct Operationalization and Scale Sources

Construct	No. of Items	Scale Source	Example Item
Attitude	5	Ajzen (2002); Verbeke (2005)	"Consuming health drinks is beneficial for my health"
Subjective Norms	4	Ajzen (2002)	"My family members think I should consume health drinks"
Perceived Behavioral Control	5	Ajzen (2002); Armitage & Conner (2001)	"I can afford to purchase health drinks regularly"
Behavioral Intention	3	Ajzen (2002)	"I intend to consume health drinks in the next month"
Consumption Behavior	3	Developed for study	"I consume health drinks at least three times per week"
Stage of Change	1 (categorical)	Prochaska & DiClemente (1983)	Single-item stage assessment (see Appendix A)

Data Analysis

Data were analysed in two stages. First, descriptive statistics and reliability analysis were conducted using SPSS 26.0. Second, confirmatory factor analysis (CFA) and structural equation modelling (SEM) were performed using AMOS 24.0. The two-step approach recommended by Anderson and Gerbing (1988) was followed: the measurement model was evaluated for reliability and validity prior to testing the structural model.

To confirm convergent validity, AVE and CR were computed for each construct, with minimum thresholds of 0.50 and 0.70 respectively (Fornell & Larcker, 1981; Hair et al., 2019). Discriminant validity was evaluated using the HTMT criterion (Henseler et al., 2015), with values below 0.85 indicating adequate construct distinctiveness. Model fit was evaluated using CFI, TLI, RMSEA, and SRMR, following conventional thresholds (Hair et al., 2019). Moderation by SoC

(H6) was tested using multi-group SEM, comparing path coefficients across early-stage (Pre-contemplation + Contemplation) and late-stage (Preparation + Action + Maintenance) groups.

RESULTS

Demographic Profile

We present results in seven subsections, moving from sample demographics through reliability and validity to structural model outcomes and stage moderation findings.

Table 3: Demographic Profile of Respondents (N = 450)

Gender	**Male**	**216**	**48.0**
	Female	234	52.0
Age	18–25 years	126	28.0
	26–35 years	167	37.1
	36–45 years	104	23.1
	46–55 years	53	11.8
Location	Urban (Bengaluru)	270	60.0
	Rural (Karnataka)	180	40.0
Monthly Income	Below ₹30,000	203	45.1
	₹30,001–₹60,000	144	32.0
	Above ₹60,000	103	22.9
Education	Secondary or below	89	19.8
	Graduate	231	51.3
	Postgraduate & above	130	28.9

Inference and Interpretation

The demographic profile of the 450 respondents reveals a broadly balanced and representative sample across key socio-demographic dimensions. The gender distribution is near-equal, with female respondents comprising a slight majority (52%), which is consistent with the study's focus on household dietary decision-making, wherein women in Indian households typically play a dominant role in food purchase and consumption choices (Misra & Singh, 2021)

The age distribution indicates that the majority of respondents fall within the 26–35 year bracket (37.1%), followed by the 18–25 cohort (28%), collectively accounting for over 65% of the sample. This skew toward

younger adults is theoretically appropriate, as this demographic segment is most actively engaged with health and wellness products and represents the primary target audience for branded health drink manufacturers in India (Nielsen India, 2024). The relatively smaller representation of the 46–55 age group (11.8%) reflects both sampling realities and the product category's stronger orientation toward younger consumers and children.

The urban-rural split (60% urban, 40% rural) was deliberately maintained through stratified sampling to ensure adequate representation of both segments, enabling meaningful comparative analysis. The income distribution, with 45.1% of respondents earning below ₹30,000 per month, accurately mirrors Karnataka's income stratification and underscores the economic heterogeneity of the sample. This income profile is particularly significant given the study's focus on affordability as a structural barrier, as nearly half the

sample occupies a price-sensitive economic bracket where health drink expenditure represents a non-trivial household budget allocation. The education profile, with 51.3% holding graduate-level qualifications, suggests a sample with adequate health literacy to meaningfully respond to attitudinal and normative constructs, while the 19.8% with secondary or below education introduces sufficient variance to capture the effect of health literacy on behavioral intention.

Descriptive Statistics

Table 4: Descriptive Statistics by Construct

Construct	Mean	Std. Dev.	Skewness	Kurtosis
Attitude	4.82	1.14	–0.31	0.12
Subjective Norms	4.51	1.22	–0.18	–0.24
Perceived Behavioral Control	4.23	1.31	–0.09	–0.31
Behavioral Intention	4.67	1.19	–0.27	0.08
Consumption Behavior	3.94	1.38	0.14	–0.19

Inference and Interpretation

The descriptive statistics reveal important insights into the central tendencies and variability of the five theoretical constructs. Attitude recorded the highest mean score (M = 4.82, SD = 1.14) among all constructs, indicating that on average, respondents hold moderately favorable evaluations of health drinks in terms of taste, nutritional value, and health benefits. However, the standard deviation of 1.14 signals meaningful inter-individual variability in attitudinal positions, suggesting that while a positive evaluative tendency exists at the aggregate level, a substantial segment of consumers harbors ambivalent or unfavorable attitudes — a pattern consistent with the cultural skepticism toward processed beverages documented in the Indian FMCG literature (Kumar & Singh, 2023).

Behavioral Intention recorded the second highest mean (M = 4.67, SD = 1.19), indicating a moderate level of motivational readiness across the sample. Importantly, the gap between Attitude (4.82) and Behavioral Intention (4.67) is modest, suggesting that for those with favorable attitudes, intention formation is relatively proximate — a finding consistent with the strong attitude–intention path coefficient (β = 0.42) observed in the structural model.

Subjective Norms (M = 4.51, SD = 1.22) and PBC (M = 4.23, SD = 1.31) recorded lower mean scores, indicating that perceived social pressure and structural enablers are comparatively weaker drivers of consumption motivation. The relatively lower PBC mean is particularly noteworthy: it reflects the real-world constraints of affordability and retail accessibility that disproportionately affect lower-income and rural consumers in the sample. PBC also recorded the highest standard deviation (1.31) among all constructs, indicating that perceptions of behavioral control are most heterogeneous across respondents — a variance pattern consistent with the sharp urban-rural divide in product accessibility and household income distribution.

Consumption Behavior recorded the lowest mean (M = 3.94, SD = 1.38), falling marginally below the scale midpoint of 4.0. This finding is substantively significant: despite moderately favorable attitudes and intentions, actual consumption behavior falls short of the midpoint, providing concrete empirical evidence of an intention–behavior gap in the health drink category. The relatively wide dispersion (SD = 1.38) further indicates that behavioral actualization is highly

uneven across the sample, ranging from near-absent consumption among early-stage consumers to habitual consumption among those in the Action and Maintenance stages. The slightly positive skewness (0.14) for consumption behavior, contrasted with negative skewness values for attitudinal constructs, suggests that while most respondents lean toward favorable attitudes and intentions, actual behavioral performance trails behind — a pattern that reinforces the theoretical significance of the SoC moderation findings.

Reliability and Validity

Table 5: Reliability, Convergent Validity, and Discriminant Validity

Construct	Cronbach α	CR	AVE	HTMT (max)
Attitude	0.87	0.89	0.62	0.74
Subjective Norms	0.89	0.91	0.67	0.71

Perceived Behavioral Control	0.85	0.88	0.59	0.76
Behavioral Intention	0.91	0.93	0.71	0.78
Consumption Behavior	0.88	0.90	0.65	—

All Cronbach alpha values exceed the recommended threshold of 0.70 (Nunnally, 1978). CR values ≥ 0.88 confirm construct reliability. AVE values ≥ 0.59 confirm convergent validity. All HTMT values fall below the 0.85 threshold, confirming discriminant validity (Henseler et al., 2015).

Inference and Interpretation

The reliability and validity analysis confirms the psychometric adequacy of all five constructs in the measurement model. Cronbach's alpha values range from 0.85 (PBC) to 0.91 (Behavioral Intention), all comfortably exceeding the widely accepted threshold of 0.70 (Nunnally, 1978). These values indicate high internal consistency within each construct, meaning that the items comprising each scale consistently measure the same underlying theoretical dimension. Behavioral

Intention recorded the highest alpha (0.91), reflecting the strong conceptual coherence of intentional statements, which by nature are closely worded and directionally aligned. PBC recorded the lowest alpha (0.85), which is nonetheless well above the threshold and may reflect the inherently multidimensional nature of PBC — spanning both internal (self-efficacy) and external (affordability, availability) dimensions that introduce slightly greater item-level variability.

Composite Reliability (CR) values range from 0.88 to 0.93, all exceeding the recommended threshold of 0.70 (Hair et al., 2019). CR is considered a more robust indicator of construct reliability than Cronbach's alpha as it accounts for differential item loadings rather than assuming equal contribution, making it the preferred reliability metric in SEM-based research. The consistently high CR values across all constructs provide strong evidence of measurement reliability.

Average Variance Extracted (AVE) values range from 0.59 (PBC) to 0.71 (Behavioral Intention), all meeting or exceeding the 0.50 threshold recommended by Fornell and Larcker (1981). AVE represents the proportion of construct variance explained by its indicators relative to measurement error. Values above 0.50 confirm convergent validity, indicating that the items within each scale share more variance with their intended construct than with measurement error. The highest AVE for Behavioral Intention (0.71) confirms that intentional items are most tightly convergent, while PBC's comparatively lower AVE (0.59) — though still acceptable — again reflects its multidimensional composition.

Discriminant validity, assessed through the Heterotrait-Monotrait (HTMT) ratio, is confirmed for all construct pairs, with maximum HTMT values ranging from 0.71 to 0.78, all falling below the stringent 0.85 threshold (Henseler et al., 2015). This confirms that each construct in the model is empirically distinct from the others, and that shared variance between constructs does not threaten the independence of the theoretical dimensions. Notably, the highest HTMT value (0.78) involves Behavioral Intention and Consumption Behavior, which is theoretically expected given the proximal causal relationship between these two constructs in the TPB framework, and remains comfortably within acceptable bounds.

Measurement Model (CFA)

Table 6: CFA Model Fit Indices

Index	Value	Recommended Threshold	Assessment
χ^2/df	2.31	< 3.0	Acceptable
CFI	0.95	> 0.90	Good Fit
TLI	0.94	> 0.90	Good Fit
RMSEA	0.048	< 0.08	Good Fit
SRMR	0.045	< 0.08	Good Fit

The measurement model demonstrates excellent fit across all indices, supporting the factorial validity of the instrument.

Inference and Interpretation

The confirmatory factor analysis model demonstrates excellent fit across all evaluated indices, providing strong

support for the proposed five-factor measurement structure. The chi-square to degrees of freedom ratio (χ^2/df = 2.31) falls well within the recommended threshold of 3.0, indicating an acceptable level of model parsimony relative to data fit (Hair et al., 2019). Values approaching 1.0 indicate near-perfect fit, while values below 3.0 are considered acceptable for models of this complexity.

The Comparative Fit Index (CFI = 0.95) and Tucker-Lewis Index (TLI = 0.94) both exceed the conventional threshold of 0.90, confirming that the hypothesized factor structure fits the observed data substantially better than a null independence model. CFI is particularly robust to sample size variations, making it the preferred incremental fit index in SEM research, while TLI additionally penalizes for model complexity, ensuring that fit is not artificially inflated by an excessive number of parameters.

The Root Mean Square Error of Approximation (RMSEA = 0.048) falls well below the 0.08 threshold and approaches the 0.05 benchmark indicative of close model fit, suggesting that the model approximates the population covariance structure with minimal error per degree of freedom. The Standardized Root Mean Square Residual (SRMR = 0.045) similarly falls below the 0.08threshold, indicating that the average discrepancy between the observed and model-implied correlation matrices is small and within acceptable bounds. Collectively, these fit indices provide robust empirical justification for proceeding to the structural model, confirming that the measurement model accurately captures the theorized factor structure underlying the data.

Table 6a: CFA Standardised Factor Loadings

Construct	Item	Std. Loading	t-value
Attitude	ATT1	0.81	Fixed
	ATT2	0.78	12.41***
	ATT3	0.79	12.73***
	ATT4	0.76	12.08***
	ATT5	0.80	12.89***
Subjective Norms	SN1	0.79	Fixed
	SN2	0.77	11.92***
	SN3	0.81	12.44***
	SN4	0.76	11.71***
PBC	PBC1	0.77	Fixed
	PBC2	0.75	11.52***
	PBC3	0.78	11.94***
	PBC4	0.76	11.65***
	PBC5	0.74	11.28***
Behavioral Intention	BI1	0.84	Fixed
	BI2	0.86	13.61***
	BI3	0.85	13.44***
Consumption Behavior	CB1	0.82	Fixed
	CB2	0.80	12.74***
	CB3	0.83	13.11***

*Note: All standardised loadings exceed 0.70. *** $p < 0.001$. First item per construct fixed for identification*

Structural Model Results

The structural model results provide strong empirical support for all six hypotheses, confirming the theoretical validity of the integrated TPB–SoC framework in the health drink consumption context.

Hypothesis H1, positing that attitude positively influences behavioral intention, is strongly supported (β = 0.42, t =

8.75, $p < 0.001$). Attitude emerges as the single strongest predictor of intention in the model, consistent with the meta-analytic findings of Armitage and Conner (2001) and Sharma and Tiwari (2020) in the Indian functional food context. The magnitude of this coefficient suggests that for every unit increase in attitude favorability, behavioral intention increases by 0.42 units, holding other predictors constant. This finding underscores that perceptions of taste, health benefits, and product quality are the most powerful motivational levers available to health drink marketers seeking to stimulate consumer intention.

Hypothesis H3, positing that PBC positively influences intention, is the second most strongly supported path ($\beta = 0.31$, $t = 6.89$, $p < 0.001$). The strength of this relationship highlights the role of structural enablers — particularly affordability and product accessibility — in shaping motivational readiness. This finding is particularly meaningful in the Indian context, where nearly half the sample earns below ₹30,000 monthly, making financial capacity a binding constraint on both the formation and actualization of consumption intentions.

Hypothesis H2, positing that subjective norms positively influence intention, is supported ($\beta = 0.25$, $t = 6.10$, $p < 0.001$), though with a comparatively smaller coefficient. While normative influence is significant, its relatively lower magnitude compared to attitude and PBC suggests that in this sample, individual evaluative beliefs and structural enablers exert greater motivational influence than social pressure. This contrasts somewhat with findings in more collectivist samples (Bashir et al., 2022) and may reflect the moderating role of urban individualism among the 60% urban sub-sample.

Hypothesis H4, positing that behavioral intention predicts consumption behavior, is strongly supported ($\beta = 0.38$, $t = 7.31$, $p < 0.001$), confirming the core TPB proposition that intention is the most proximal predictor of behavior. However, the moderate magnitude of this coefficient — rather than a value approaching 1.0 — signals the presence of an intention–behavior gap, a finding further illuminated by the Stage of Change moderation analysis.

Hypothesis H5, positing a direct PBC → behavior path, is supported ($\beta = 0.22$, $p < 0.01$), confirming that structural constraints operate independently of intentional pathways to inhibit behavioral actualization. This direct effect is theoretically important: it implies that even among consumers who have formed strong intentions, real-world barriers of affordability and accessibility can independently suppress consumption behavior.

The overall model explains 58% of variance in consumption behavior ($R^2 = 0.58$), which represents a strong level of explanatory power for a behavioral model of this complexity and is substantially

higher than the 35–45% variance explanation typically reported in single-framework TPB studies in food behavior contexts (McEachan et al., 2011), underscoring the theoretical value added by the integrated TPB–SoC approach.

Table 7: Structural Model Results (Hypotheses Testing)

Hypothesis	Path	β	S.E.	t-value	p-value	Result
H1	Attitude → Intention	0.42	0.048	8.75	< 0.001	Supported
H2	Subj. Norms → Intention	0.25	0.041	6.10	< 0.001	Supported
H3	PBC → Intention	0.31	0.045	6.89	< 0.001	Supported
H4	Intention → Behavior	0.38	0.052	7.31	< 0.001	Supported
H5	PBC → Behavior	0.22	0.047	4.68	< 0.01	Supported
H6	SoC Moderation	—	—	—	< 0.05	Supported (MG-SEM)

The integrated model explains 58% of variance in consumption behavior ($R^2 = 0.58$), indicating strong explanatory power.

Inference and Interpretation

Table 5a: Urban vs. Rural Comparison of Key Constructs

Construct	Urban Mean (SD)	Rural Mean (SD)	t-value	Interpretation
Attitude	5.21 (1.09)	4.31 (1.22)	8.34***	Urban more favorable
Subjective Norms	4.63 (1.18)	4.38 (1.26)	2.61**	Moderate difference
PBC	4.72 (1.14)	3.52 (1.38)	9.11***	Urban far higher PBC
Behavioral Intention	4.89 (1.09)	4.42 (1.28)	4.87***	Urban stronger
Consumption Behavior	4.18 (1.31)	3.64 (1.44)	4.94***	Urban higher frequency
Late Stage %	32.0%	12.0%	—	Urban more behaviorally advanced

*Note: ** $p < 0.01$; *** $p < 0.001$. Independent samples t-test. Urban n=262; Rural n=188.*

Stage of Change Distribution

Table 8: Distribution of Respondents Across Stages of Change

Stage	**n**	**Percentage (%)**	**Cumulative (%)**
Pre-contemplation	153	34.0	34.0
Contemplation	162	36.0	70.0
Preparation	72	16.0	86.0
Action	41	9.1	95.1
Maintenance	22	4.9	100.0

Approximately 70% of respondents are concentrated in the Pre-contemplation and Contemplation stages, indicating that the majority of consumers have not yet formed a stable behavioral commitment to regular health drink consumption.

Inference and Interpretation

The stage distribution findings represent one of the most substantively significant outcomes of this study. Approximately 70% of respondents are concentrated in the two earliest stages — Pre-contemplation (34%) and Contemplation (36%) — indicating that the vast majority of consumers in the sample have not yet developed a stable behavioral commitment to regular health drink consumption.

The 34% Pre-contemplation proportion is particularly striking from a market development perspective. Pre-contemplators are not simply undecided consumers; they actively perceive no personal need or motivation to modify their current beverage behavior. This segment is unlikely to respond to conventional health-benefit-focused marketing communication, as such messaging presupposes an acknowledged health need that Pre-contemplators have not yet recognized. The large Pre-contemplation proportion reflects the continued cultural dominance of traditional beverages, the low perceived necessity of fortified commercial products, and limited health literacy in rural segments of the sample.

The 36% Contemplation proportion represents a strategically important transitional segment. Contemplators acknowledge awareness of health drinks and may have considered adoption, but remain ambivalent — weighing perceived benefits against cultural preferences, affordability concerns, and taste uncertainty. This segment is most receptive to persuasive communication that

directly addresses specific adoption barriers and provides social validation through normative cues.

Together, the Preparation (16%), Action (9%), and Maintenance (5%) stages account for only 30% of the sample, confirming that habitual health drink consumption remains confined to a minority of consumers. The extremely low Maintenance proportion (5%) is particularly revealing: it suggests that even among consumers who have adopted health drinks, sustained habitual consumption is rare, pointing to significant challenges in habit formation and brand loyalty. This finding has direct implications for customer retention strategies and underscores the importance of post-purchase reinforcement in converting trial consumers into regular users.

Compared to stage distributions observed in dietary behavior studies in Western contexts, where early-stage proportions typically range from 40–55% (Brug et al., 2005), the 70% early-stage concentration in this sample is substantially more pronounced, reflecting the unique combination of cultural, structural, and psychological barriers specific to the Indian FMCG health drink market.

Multi-Group Moderation Analysis (H6)

Table 9: Multi-Group SEM: Early Stage vs. Late Stage Comparison

Path	Early Stage β	Late Stage β	Δβ	p (Difference)
Attitude → Intention	0.29	0.54	0.25	0.003
Subj. Norms → Intention	0.19	0.33	0.14	0.021
PBC → Intention	0.24	0.41	0.17	0.014
Intention → Behavior	0.21	0.52	0.31	< 0.001

Stage of Change significantly moderates all four TPB pathways, with path coefficients substantially stronger for late-stage consumers. The intention-behavior gap is particularly pronounced among early-stage consumers (β = 0.21 vs. 0.52), indicating that intention alone is insufficient to drive behavior in the absence of adequate behavioral readiness.

Inference and Interpretation

Table 7a: Measurement Invariance Tests — Early Stage vs. Late Stage Groups

Model	**CFI**	**ΔCFI**	**RMSEA**	**ΔRMSEA**	**Decision**
Configural Model	0.952	—	0.048	—	Accepted
Metric Model	0.948	−0.004	0.049	+0.001	Accepted (ΔCFI < 0.010)
Scalar Model	0.943	−0.005	0.050	+0.001	Accepted (ΔCFI < 0.010)

Note: ΔCFI < 0.010 confirms full scalar invariance (Cheung & Rensvold, 2002; Vandenberg & Lance, 2000).

Prior to the multi-group SEM (H6), measurement invariance was tested across early-stage (Pre-contemplation, Contemplation, Preparation) and late-stage (Action, Maintenance) groups. Table 7a confirms full scalar invariance, validating that path coefficient differences reflect genuine behavioral differences rather than measurement artefacts.

The multi-group SEM results provide robust empirical confirmation of Hypothesis H6, demonstrating that Stage of Change significantly moderates all four TPB pathways, with path coefficients being consistently and substantially stronger among late-stage consumers (Preparation, Action, Maintenance) compared to early-stage consumers (Pre-contemplation, Contemplation).

The moderation of the Attitude → Intention path (early: β = 0.29 vs. late: β = 0.54, Δβ = 0.25, p = 0.003) indicates that favorable attitudes translate into intention far more effectively among consumers who are already prepared or actively engaging with the behavior. For early-stage consumers, even positive attitudinal evaluations may not crystallize into intention due to competing cultural loyalties, perceived irrelevance, or dispositional inertia. This finding is consistent with Greene et al. (1999), who demonstrated that attitudinal influence on intention is stage-dependent, and extends their findings to the Indian FMCG context.

The moderation of the Subjective Norms → Intention path (early: β = 0.19 vs. late: β = 0.33, Δβ = 0.14, p = 0.021) suggests that normative influence is more impactful among consumers who are already behaviorally engaged. This pattern may reflect a self-selection dynamic: consumers in later stages are more likely to belong to social networks where health drink consumption is normalized, thereby amplifying the normative signal they receive.

The moderation of the PBC → Intention path (early: β = 0.24 vs. late: β = 0.41, Δβ = 0.17, p = 0.014) reveals that perceptions of affordability and accessibility are more motivationally salient for late-stage consumers, who are actively navigating the practical logistics of consumption. For Pre-contemplators, PBC constraints may be perceived as less relevant given their overall disengagement from the behavior — they are unlikely to be actively weighing affordability when they have not yet formed an intention to purchase.

Most critically, the moderation of the Intention → Behavior path (early: β = 0.21 vs. late: β = 0.52, Δβ = 0.31, $p < 0.001$) reveals the most pronounced stage-dependent effect in the model. The weak intention–behavior translation among early-stage consumers (β = 0.21) constitutes empirical evidence of a substantial intention–behavior gap — a well-documented phenomenon in behavioral science (Sheeran, 2002) that is here shown to be strongly conditioned by behavioral readiness. Even when early-stage consumers report moderate intentions, these intentions fail to convert into actual consumption behavior at rates comparable to their late-stage counterparts. This finding has profound implications for marketing strategy: campaigns that successfully elevate intention among Pre-contemplators and Contemplators may still yield limited behavioral impact unless accompanied by stage-transition interventions that advance consumers toward Preparation and Action stages.

DISCUSSION

TPB Pathways and Their Implications

Our results confirm the predictive validity of the Theory of Planned Behavior in explaining health drink consumption behavior among Indian consumers. Attitude emerged as the strongest predictor of behavioral intention (β = 0.42), consistent with prior meta-analytic findings (Armitage & Conner, 2001; McEachan et al., 2011) and specifically aligning with studies in food behavior contexts where affective and cognitive evaluations of product attributes dominate intention formation (Urala & Lahteenmaki, 2007). The strength of the attitude-intention path in this study reflects the salience of taste perceptions and perceived health benefits in shaping consumer motivations—a finding consistent with Kumar and Singh (2023) in the Indian FMCG context.

PBC was the second strongest predictor of intention (β = 0.31) and also exerted a notable direct effect on behavior (β = 0.22). This dual role of PBC confirms the importance of structural enablers

in health drink adoption. In markets where a substantial proportion of consumers (45.1% in this sample) earn below ₹30,000 per month, affordability represents a binding constraint on both intention and behavior. The direct PBC-behavior path suggests that even among consumers who intend to consume, practical accessibility and financial constraints may prevent actualization. This finding extends prior research by Bashir et al. (2022) in South Asian markets and has direct implications for pricing strategy.

We find that subjective norms, while statistically reliable (β = 0.25), contributed less strongly than attitude and PBC. This contrasts somewhat with Bashir et al. (2022), who found normative influence dominant in Pakistani consumers. The relatively lower normative effect in this sample may reflect the heterogeneous urban-rural composition, though this interpretation is post-hoc and would require targeted empirical investigation before firm conclusions can be drawn (Misra & Singh, 2021).

The 70% Early-Stage Finding: Implications for Adoption

The most striking empirical finding of this study is the concentration of approximately 70% of respondents in the Pre-contemplation and Contemplation stages of behavioral readiness. This finding is far more pronounced than stage distributions observed in comparable studies of dietary behavior change in urban Western contexts, where early-stage proportions typically range from 40–55% (Brug et al., 2005; Noroozi et al., 2017). The disparity reflects the distinct contextual dynamics of the Indian market: the continued cultural salience of traditional beverages, widespread skepticism toward commercially processed health products, and the relatively recent penetration of branded health drinks in rural Karnataka.

The high proportion of Pre-contemplation stage consumers (34%) is particularly telling from a marketing perspective. These individuals are not merely undecided; they actively perceive no need to change their current beverage behavior. Conventional health-benefit-focused marketing communication is likely to be ineffective for this segment, as such messaging presupposes an existing awareness of a health need that Pre-contemplators do not acknowledge. This finding calls for upstream awareness-building interventions that address the fundamental perceived necessity of fortified beverages before persuading on specific product attributes.

The multi-group moderation analysis (H6) provides further granularity: the intention-behavior relationship was substantially weaker in the early-stage group (β = 0.21) than in the late-stage

group (β = 0.52). This intention-behavior gap mirrors findings in physical activity research (Sheeran, 2002) and dietary fat reduction studies (Greene et al., 1999), and highlights the importance of behavioral facilitation strategies—such as specific if-then planning prompts—that help consumers bridge the distance from wanting to acting, converting existing motivation into concrete behavioral steps.

Cultural and Structural Barriers

Cultural preference for traditional beverages emerged as a pattern reflected quantitatively in the low mean scores for consumption behavior (M = 3.94 on a 7-point scale). As Grunert (2010) has argued, food choice in emerging markets is embedded in a complex matrix of cultural meaning that processed products must navigate carefully. In South Karnataka specifically, beverages such as ragi malt and chaas are not merely dietary choices but expressions of regional identity and intergenerational practice. Health drink manufacturers that position their products as replacements—rather than complements—to these traditional beverages are likely to encounter resistance rooted not in rational cost-benefit calculation but in identity-protective motivation (Hartmann & Siegrist, 2017).

Structural barriers, particularly affordability and retail accessibility, disproportionately affect rural consumers in this sample. With 45.1% of respondents earning below ₹30,000 per month, the price points of leading health drink brands represent a non-trivial budget allocation. The direct PBC-behavior relationship observed in this study (β = 0.22) suggests that structural constraints operate

independently of motivational pathways—reinforcing the need for pricing and distribution strategies as preconditions for behavioral change in lower-income segments.

Urban vs. Rural Differences

Comparative analysis between urban and rural subsamples revealed meaningful differences in construct means and stage distributions. Urban respondents reported notably higher attitude scores ($M = 5.21$ vs. 4.31, $t = 8.34$, $p < 0.001$) and higher PBC ($M = 4.72$ vs. 3.52, $t = 9.11$, $p < 0.001$).

Stage placement also differed sharply: 32% of urban respondents occupied late stages compared to just 12% in rural areas. These patterns confirm that barriers to health drink adoption are not uniform across geographies. Differentiated marketing strategies, tailored separately for urban and rural segments, are therefore essential.

Theoretical Contribution

We argue that this study makes three distinct theoretical contributions. First, it provides the first empirical test of an integrated TPB-SoC framework in the Indian health drink context. The integration yields a richer account of consumer behavior than either framework alone could provide. Second, the multi-group moderation findings extend Greene et al.'s (1999) model to a non-Western, emerging market FMCG context, demonstrating cross-cultural generalizability while also surfacing context-specific dynamics. Third, by documenting the 70% early-stage concentration and its moderating role in the intention-behavior relationship, the study advances understanding of the implementation gap in health behavior adoption in collectivist, price-sensitive consumer markets.

Managerial and Policy Implications

Managerial Implications

The findings carry several specific, actionable implications for health drink marketers in India.

Stage-based marketing communication: Given that 70% of consumers remain in early readiness stages, marketing campaigns should be segmented by stage. For Pre-contemplators, communication should focus on problem awareness and perceived susceptibility to nutritional deficiencies, rather than on product features. Contemplators require persuasive content that reduces ambivalence and enhances self-efficacy. Action-stage consumers, by contrast, respond better to reinforcement, loyalty programs, and social validation.

Attitude enhancement through transparent health narratives: Since attitude is the strongest predictor of intention, campaigns that provide credible, evidence-based information on health benefits—endorsed by pediatricians and nutritionists—are likely to yield greater intention change than purely aspirational advertising.

Pricing and packaging innovation: To address the PBC constraints of lower-income consumers, manufacturers should invest in smaller, more affordable packaging formats (e.g., 100g sachets priced at ₹20–30). Tiered pricing structures and rural retail partnerships (e.g., through Kirana stores and self-help group distribution networks) can expand structural accessibility

Strengthening rural distribution: A dedicated rural go-to-market strategy, including last-mile distribution infrastructure and partnerships with cooperative societies, is essential to reduce the availability gap that constrains PBC in rural Karnataka.

Cultural integration in brand positioning: Rather than positioning health drinks as alternatives to traditional beverages, brands that frame their products as nutritional enhancements to existing cultural practices (e.g., "add to your morning ragi routine") may encounter less cultural resistance. Collaborations with traditional health practitioners (Ayurvedic vaidyas) could further legitimize health claims in culturally conservative segments.

Public Policy Implications

From a public health perspective, the high concentration of consumers in early behavioral stages indicates that market mechanisms alone may be insufficient to drive widespread adoption of fortified beverages as a nutritional supplement strategy. Government and public health agencies may consider:

Integrating health drink awareness into school nutrition programs, particularly in rural Karnataka, where nutritional deficiencies among school-age children remain prevalent (IMRB, 2023).

Implementing subsidized fortified beverage distribution through the Public Distribution System (PDS) or Integrated Child Development Services (ICDS) for below-poverty-line households.

Mandating clear, simplified nutritional labeling to improve health literacy and reduce consumer skepticism toward fortified products.

Limitations and Future Research

This study acknowledges several limitations. First, the cross-sectional snapshot employed here captures associations rather than causal sequences, and cannot track how individual consumers move between behavioral stages in response to specific triggers. Longitudinal panel designs would be better positioned to capture these dynamics and establish causal directionality. Second, the study is geographically limited to Karnataka, and findings may not generalize to other Indian states with distinct dietary cultures (e.g., Punjab, Gujarat, or northeastern states). Third, self-reported

behavioral data are subject to social desirability bias, particularly in health-related contexts where respondents may overstate health-conscious behaviors. Future studies should incorporate objective behavioral measures (e.g., actual purchase data from loyalty programs).

Fourth, the SoC measurement relied on a single-item staging algorithm, which, while consistent with prior dietary behavior research (Noroozi et al., 2017), may introduce measurement imprecision. Multi-item stage assessments should be explored in future work. Fifth, the study does not include comparative analysis between health drinks and competing beverage categories (e.g.,

carbonated soft drinks, energy drinks), which would provide richer context for positioning strategy.

Looking ahead, we identify five directions for future research. Longitudinal designs should examine stage transitions in response to targeted interventions. Cross-regional studies can extend findings beyond Karnataka to other culturally distinct Indian states. Future work should explore health consciousness as a mediator between attitude and intention. The role of digital health information and social media in accelerating stage progression warrants dedicated inquiry. Finally, brand trust and transparency merit investigation as attitudinal antecedents in the functional beverage context.

CONCLUSION

This study integrates the Theory of Planned Behavior and the Stages of Change model to examine barriers to health drink consumption among Indian consumers in urban Bengaluru and rural Karnataka. The empirical findings confirm that attitude, perceived behavioral control, and subjective norms collectively and demonstrably predict behavioral intention, which in turn predicts consumption behavior. The integrated model explains 58% of variance in consumption behavior, demonstrating strong explanatory utility.

The most consequential finding—that nearly 70% of consumers remain in early behavioral readiness stages—reveals a profound gap between market growth narratives and the actual behavioral adoption of health drinks among Indian consumers. This gap is shaped by a confluence of cultural preferences for traditional beverages, structural affordability constraints, and limited perceived necessity for fortified products. The multi-group moderation analysis further

demonstrates that behavioral readiness systematically amplifies the strength of TPB pathways, particularly the intention-behavior relationship.

These findings collectively argue for a reorientation of health drink marketing and public health strategies from feature-focused persuasion to stage-appropriate, culturally sensitive, and structurally enabling interventions. Addressing the awareness, affordability, and cultural acceptability dimensions simultaneously will be essential for unlocking the full potential of fortified health beverages as a vehicle for nutritional improvement in the emerging Indian market

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