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Brand Equity And Physician Prescribing Behavior: A Behavioral Economic Approach To Pharmaceutical Marketing Effectiveness

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ABSTRACT

The pharmaceutical industry operates in a complex environment where physician prescribing behavior significantly influences market success. This study examines the relationship between brand equity and physician prescribing behavior through a behavioral economic lens, investigating how cognitive biases and heuristics influence prescribing decisions. The primary objective is to assess the impact of brand equity dimensions on physician prescribing patterns and evaluate pharmaceutical marketing effectiveness using behavioral economic principles. A descriptive cross-sectional design was employed, surveying 200 physicians across various specialties in metropolitan India using a structured questionnaire. The hypothesis posited that higher brand equity significantly correlates with increased prescription frequency, mediated by behavioral economic factors such as anchoring, availability heuristic, and social proof. Results revealed that brand awareness ($\beta=0.42$, $p<0.001$), perceived quality ($\beta=0.38$, $p<0.001$), and brand loyalty ($\beta=0.35$, $p<0.001$) significantly predict prescribing behavior. Behavioral economic interventions, particularly default settings and social reference points, demonstrated 34% effectiveness in influencing prescription patterns. The study concludes that brand equity serves as a powerful predictor of physician prescribing behavior, with behavioral economic factors acting as significant mediators. Pharmaceutical companies can enhance marketing effectiveness by leveraging brand equity development strategies integrated with behavioral nudges, though ethical considerations regarding undue influence must be carefully addressed.

Keywords: *Brand Equity, Physician Prescribing Behavior, Behavioral Economics, Pharmaceutical Marketing, Cognitive Biases*

1. INTRODUCTION

The global pharmaceutical industry, valued at approximately $1.48 trillion in 2022, faces unprecedented challenges in an era characterized by intensifying competition, patent expirations, regulatory scrutiny, and evolving healthcare dynamics (IQVIA, 2023). Within this complex landscape, brand equity has emerged as a critical intangible asset that differentiates pharmaceutical products and influences physician prescribing behavior (Keller, 2013). Unlike traditional consumer goods industries where end-users make direct purchase decisions, the pharmaceutical sector operates within

a unique agency model where physicians act as intermediaries, making prescribing decisions on behalf of patients (Manchanda & Honka, 2005). This separation between the prescriber, payer, and consumer creates distinctive marketing challenges and opportunities. Brand equity, defined as the differential effect that brand knowledge has on consumer response to marketing activities (Aaker, 1991), has traditionally been studied in fast-moving consumer goods contexts. However, its application in pharmaceutical marketing presents unique dimensions. Physicians, as highly educated professionals, rely on scientific evidence, clinical experience, and peer recommendations when making prescribing decisions (Venkataraman & Stremersch, 2007). Yet, mounting evidence suggests that pharmaceutical marketing activities significantly influence these decisions, often in ways inconsistent with purely rational economic models (Spurling et al., 2010; DeJong et al., 2016).

Behavioral economics, pioneered by scholars such as Daniel Kahneman and Amos Tversky, challenges the neoclassical economic assumption of perfect rationality, demonstrating that human decision-making is systematically influenced by cognitive biases, heuristics, and contextual factors (Kahneman, 2011; Thaler & Sunstein, 2008). In healthcare contexts, behavioral economic principles have been successfully applied to improve medication adherence, reduce inappropriate prescribing, and optimize clinical decision-making (Patel et al., 2018; Wang & Groene, 2020). However, limited research has integrated behavioral economic frameworks with brand equity theory to understand pharmaceutical marketing effectiveness and physician prescribing behavior. The Indian pharmaceutical market, the third-largest globally by volume and fourteenth by value, presents a particularly relevant context for this investigation (IBEF, 2024). India's pharmaceutical industry is characterized by intense competition among branded generics, aggressive marketing practices, and a large prescriber base practicing across diverse socioeconomic contexts. Indian physicians encounter numerous pharmaceutical brands daily through medical representatives, continuing medical education programs, scientific literature, and digital platforms. Understanding how brand equity dimensions interact with behavioral economic factors to influence prescribing decisions has significant implications for both pharmaceutical marketing strategy and healthcare policy.

Several gaps exist in current literature. First, while numerous studies have examined either brand equity in pharmaceutical contexts or behavioral economics in healthcare decision-making, few have integrated these theoretical frameworks. Second, empirical evidence quantifying the relative influence of different brand equity dimensions on physician prescribing behavior remains limited, particularly in emerging markets. Third, the mechanistic role of specific behavioral economic factors such as anchoring, availability heuristic, social proof, and default bias in mediating the brand equity-prescribing relationship requires systematic investigation. This study addresses these gaps by examining the relationship between pharmaceutical brand equity and physician prescribing behavior through a behavioral economic lens. The research investigates how cognitive biases and decision-making heuristics moderate the influence of brand equity on prescribing patterns, providing empirical evidence to understand pharmaceutical

marketing effectiveness. The findings contribute to both academic literature and practical implications for pharmaceutical marketing strategy, healthcare policy, and ethical considerations in physician-industry relationships.

2. LITERATURE REVIEW

Brand Equity in Pharmaceutical Context

Brand equity theory has evolved substantially since Aaker's (1991) seminal work proposing five dimensions: brand awareness, brand associations, perceived quality, brand loyalty, and proprietary assets. Keller's (1993) customer-based brand equity (CBBE) model further emphasized the differential effect of brand knowledge on consumer response, conceptualizing brand equity through the brand knowledge pyramid comprising brand identity, brand meaning, brand response, and brand relationships. In pharmaceutical contexts, brand equity operates distinctively due to regulatory constraints, the agency relationship between physicians and patients, and the critical nature of health outcomes (Wood, 2000). Research by Manchanda and Chintagunta (2004) demonstrated that pharmaceutical brand equity primarily influences physicians rather than end-user patients, with prescribing decisions heavily weighted toward brand awareness and perceived quality. Their study found that a 10% increase in detailing visits increased new prescriptions by 0.4-0.5%, suggesting modest but significant effects of marketing exposure on brand consideration.

Brand awareness in pharmaceuticals encompasses both physician familiarity with drug names and recall of therapeutic indications, contraindications, and clinical evidence. Mizik and Jacobson (2004) found that pharmaceutical brands with higher awareness received disproportionate consideration during prescribing moments, even when therapeutic alternatives existed. This finding aligns with the salience bias in behavioral economics, where more accessible information disproportionately influences decisions (Kahneman, 2011). Perceived quality in pharmaceutical branding relates to physicians' assessments of drug efficacy, safety profiles, manufacturing standards, and company reputation. Venkataraman and Stremersch (2007) demonstrated that perceived quality significantly predicted prescription volume, independent of objective clinical superiority. This phenomenon reflects the quality-price heuristic common in consumer behavior, where professionals use brand signals to infer product quality under information asymmetry. Brand loyalty in physician prescribing manifests as habitual prescribing patterns, resistance to switching to alternative brands, and advocacy for specific brands to colleagues and patients. Narayanan et al. (2005) identified inertia and switching costs as significant factors in physician brand loyalty, with established prescribing habits difficult to alter even when new clinical evidence emerged. This behavioral pattern exemplifies the status quo bias documented extensively in behavioral economics literature (Samuelson & Zeckhauser, 1988).

Physician Prescribing Behavior and Marketing Influence

Physician prescribing behavior has been examined extensively, revealing complex interactions between clinical evidence, professional training, peer influence, patient preferences, and pharmaceutical marketing (Spurling et al., 2010). A systematic review by DeJong et al. (2016) analyzing 58 studies found consistent associations between physician-pharmaceutical industry interactions and prescribing behavior, with exposure to marketing activities increasing prescriptions of promoted drugs, higher prescription costs, and reduced rational prescribing. Pharmaceutical marketing encompasses multiple touchpoints including detailing visits by medical representatives, free samples, sponsored continuing medical education (CME), conference sponsorships, consulting relationships, and increasingly, digital marketing (Mintzes, 2012). Research demonstrates differential effectiveness across these channels. Mizik and Jacobson (2004) found that detailing visits had modest effects, requiring approximately 3-26 additional visits to induce one new prescription depending on drug class. Free sample distribution showed stronger immediate effects but uncertain long-term impact.

The physician-pharmaceutical industry relationship has attracted ethical scrutiny due to potential conflicts of interest and concerns about undue influence on clinical decision-making (Fugh-Berman & Ahari, 2007). Studies have documented that physicians systematically underestimate marketing influence on their own prescribing while recognizing its effect on colleagues a phenomenon termed the "third-person effect" (Grande et al., 2009). This cognitive blind spot has important implications for understanding actual versus perceived marketing effectiveness. Geographical variations in prescribing behavior suggest significant contextual influences. Research in India has documented particularly high pharmaceutical marketing intensity, with physicians receiving frequent visits from medical representatives and substantial non-monetary benefits (Greene & Padhy, 2017). Cultural factors, including relationship-based business practices and hierarchical professional structures, may amplify marketing influence in Asian healthcare contexts.

Behavioral Economics in Healthcare and Prescribing

Behavioral economics has revolutionized understanding of decision-making across domains, demonstrating systematic deviations from rational choice theory due to cognitive limitations, biases, and heuristics (Kahneman, 2011; Thaler & Sunstein, 2008). Applications in healthcare have proliferated, targeting clinician behavior, patient adherence, and health system efficiency (Patel et al., 2018).

Several behavioral economic concepts are particularly relevant to pharmaceutical prescribing. Anchoring bias describes the tendency to rely heavily on initial information when making decisions, with subsequent adjustments being insufficient (Tversky & Kahneman, 1974). In prescribing contexts, physicians may anchor on drugs prescribed during training or early career experiences, influencing long-term prescribing patterns regardless of new evidence. The availability heuristic causes individuals to judge probabilities based on ease of recall, with recently experienced or emotionally salient events disproportionately influencing decisions (Tversky & Kahneman, 1973). Pharmaceutical

marketing explicitly targets this heuristic through frequent exposure (increasing recall) and memorable messaging (enhancing salience). Brand equity, particularly brand awareness, directly exploits availability heuristic mechanisms. Social proof refers to the tendency to conform to observed behavior of others, particularly peers or authority figures (Cialdini, 2001). In medical contexts, physicians are influenced by prescribing patterns of colleagues, thought leaders' endorsements, and perceived standard-of-care norms. Pharmaceutical companies leverage social proof through key opinion leader (KOL) programs, testimonials, and emphasizing market share data.

Default bias describes the tendency to accept pre-selected options rather than actively choose alternatives, even when alternatives may be preferred (Samuelson & Zeckhauser, 1988). Electronic health record (EHR) systems increasingly incorporate defaults, with research demonstrating significant prescribing changes through default medication selection (Patel et al., 2016). Brand equity can influence which brands become default options through formulary placement and system design. Wang and Groene (2020) conducted a systematic review of behavioral economics interventions on physician behavior, identifying changing defaults and providing social reference points as most effective strategies. Their analysis of 17 studies found consistent positive effects on prescribing behavior, particularly for reducing inappropriate antibiotic prescribing and increasing guideline-concordant treatment. These findings demonstrate that behavioral economic principles can successfully modify physician behavior, though ethical considerations regarding manipulation versus nudging remain debated.

Integration: Brand Equity, Behavioral Economics, and Prescribing

Despite extensive separate literatures on brand equity and behavioral economics in healthcare, few studies have integrated these frameworks. Pharmaceutical brand equity likely operates partially through behavioral economic mechanisms brand awareness enhances availability heuristic influence, brand loyalty reflects default and status quo biases, and brand associations leverage social proof through perceived expert endorsement. This integration suggests that pharmaceutical marketing effectiveness cannot be fully understood through either framework alone. Brand equity provides the content what physicians know and feel about pharmaceutical brands while behavioral economics illuminates the process how cognitive biases and heuristics transform brand knowledge into prescribing decisions. This study empirically examines these relationships, providing evidence for the integrated theoretical framework and practical implications for pharmaceutical marketing and healthcare policy.

3. OBJECTIVES

The present study is guided by the following specific objectives:

1. To assess the relationship between brand equity dimensions (brand awareness, brand associations, perceived quality, brand loyalty) and physician prescribing behavior.

2. To examine the mediating role of behavioral economic factors (anchoring, availability heuristic, social proof, default bias) in the brand equity-prescribing behavior relationship.
3. To evaluate the effectiveness of pharmaceutical marketing strategies informed by behavioral economic principles in influencing physician prescribing patterns.

4. METHODOLOGY

This study adopted a descriptive cross-sectional survey design to investigate the relationship between brand equity and physician prescribing behavior from a behavioral economic perspective. The sample consisted of 200 practicing physicians across multiple specialties in metropolitan India, selected through stratified random sampling based on specialty, practice setting, experience, and gender. A structured self-administered questionnaire, validated through expert review, cognitive interviews, and pilot testing (Cronbach's alpha = 0.82–0.89), measured brand equity (Aaker, 1991; Yoo & Donthu, 2001), prescribing patterns, behavioral economic factors (anchoring, availability heuristic, social proof, default bias), and pharmaceutical marketing perceptions. Data were collected between August and November 2024 through online and in-person modes following ethical approval and informed consent procedures. Statistical analysis using SPSS 26.0 and AMOS included descriptive statistics, correlations, multiple regression, and structural equation modeling (SEM) with bootstrapped mediation analysis (5,000 samples). All assumptions for parametric tests were met, significance was set at $p<0.05$, and subgroup analyses assessed moderating effects of specialty, experience, and practice setting.

5. RESULTS

Table 1: Demographic and Professional Profile of Respondent Physicians (N=200)

Characteristic	Category	Frequency	Percentage
Gender	Male	142	71.0%
	Female	58	29.0%
Age Group	25-35 years	52	26.0%
	36-45 years	78	39.0%
	46-55 years	48	24.0%
	>55 years	22	11.0%
Medical Specialty	General Practice	64	32.0%
	Internal Medicine	48	24.0%
	Pediatrics	38	19.0%

	Surgery	28	14.0%
	Other Specialties	22	11.0%
Years of Practice	<5 years	44	22.0%
	5-10 years	62	31.0%
	10-20 years	58	29.0%
	>20 years	36	18.0%
Practice Setting	Private Clinic	72	36.0%
	Private Hospital	68	34.0%
	Government Hospital	42	21.0%
	Academic Medical Center	18	9.0%
Daily Patient Load	<20 patients	38	19.0%
	20-50 patients	94	47.0%
	>50 patients	68	34.0%

Table 1 presents the demographic and professional characteristics of the 200 physicians who participated in this study. The sample demonstrates male predominance (71.0%), consistent with medical workforce demographics in India, though female representation (29.0%) reflects increasing gender diversity in the medical profession. Age distribution shows concentration in the 36-45 years bracket (39.0%), indicating mid-career professionals with substantial prescribing experience but still engaged with contemporary marketing approaches. Specialty distribution reveals general practitioners as the largest group (32.0%), appropriate given their broad prescribing scope and high pharmaceutical marketing exposure. Experience levels are well-distributed across categories, with 53% having more than 10 years of practice, ensuring perspectives from both early-career and veteran physicians. Practice settings show predominant private sector representation (70% combined private clinic and hospital), reflective of India's healthcare delivery landscape where private practitioners constitute the majority of primary care physicians. Daily patient load data indicates that most respondents (81%) see 20 or more patients daily, confirming active clinical practice and regular prescribing decisions. This demographic profile establishes a representative sample appropriate for examining pharmaceutical brand equity and prescribing behavior relationships.

Table 2: Brand Equity Dimensions and Prescribing Behavior Correlation Analysis (N=200)

Brand Equity Dimension	Mean ± SD	Correlation with Prescribing Frequency (r)	p-value	Correlation Strength
Brand Awareness	4.12 ± 0.68	0.614	<0.001	Strong Positive
Brand Associations	3.87 ± 0.74	0.528	<0.001	Moderate Positive
Perceived Quality	4.28 ± 0.62	0.682	<0.001	Strong Positive
Brand Loyalty	3.94 ± 0.79	0.596	<0.001	Moderate Positive
Overall Brand Equity	4.05 ± 0.58	0.724	<0.001	Strong Positive
Marketing Exposure	3.76 ± 0.82	0.473	<0.001	Moderate Positive

Prescribing Frequency	3.92 ± 0.71	1.000	-	-

Note: Scale ranges from 1 (Very Low) to 5 (Very High)

Table 2 presents correlation analysis between brand equity dimensions and physician prescribing behavior, revealing significant positive associations across all measured constructs. Perceived quality demonstrates the strongest correlation with prescribing frequency ($r=0.682$, $p<0.001$), indicating that physicians' perceptions of drug quality, efficacy, and safety profiles are primary drivers of prescription decisions. This finding aligns with professional norms emphasizing evidence-based practice and patient welfare considerations. Brand awareness shows similarly strong correlation ($r=0.614$, $p<0.001$), supporting the availability heuristic hypothesis wherein physicians more readily prescribe brands that come easily to mind during clinical decision-making moments. Brand loyalty exhibits moderate-to-strong positive correlation ($r=0.596$, $p<0.001$), reflecting habitual prescribing patterns and resistance to switching behaviors documented in behavioral economics literature. Brand associations demonstrate moderate positive correlation ($r=0.528$, $p<0.001$), suggesting that physicians' mental connections between brands and therapeutic efficacy, company reputation, or clinical outcomes influence prescribing, though less strongly than quality perceptions or awareness. Overall brand equity, as a composite construct, displays very strong correlation with prescribing frequency ($r=0.724$, $p<0.001$), explaining approximately 52% of variance ($R^2=0.524$) in prescribing patterns. Marketing exposure shows moderate positive correlation ($r=0.473$, $p<0.001$), confirming that pharmaceutical promotional activities influence prescribing behavior, though the relationship is mediated through brand equity development rather than direct persuasion. All correlations achieve statistical significance at $p<0.001$ level, providing robust evidence for brand equity's substantial role in physician prescribing behavior.

Table 3: Multiple Regression Analysis - Brand Equity Dimensions Predicting Prescribing Behavior

Predictor Variable	Unstandardized Coefficient (B)	Standard Error	Standardized Coefficient (β)	t-value	p-value	VIF
Constant	0.246	0.182	-	1.352	0.178	-
Brand Awareness	0.437	0.068	0.419	6.426	<0.001	1.84
Brand Associations	0.143	0.062	0.149	2.306	0.022	2.12
Perceived Quality	0.434	0.074	0.379	5.865	<0.001	1.96
Brand Loyalty	0.315	0.058	0.351	5.431	<0.001	1.78
Years of Practice	-0.018	0.012	-0.082	-1.500	0.135	1.23
Specialty	0.026	0.031	0.042	0.839	0.403	1.15
Practice Setting	0.054	0.038	0.071	1.421	0.157	1.19

Model Summary: $R = 0.798$, $R^2 = 0.637$, Adjusted $R^2 = 0.624$, $F(7,192) = 48.16$, $p<0.001$

Table 3 presents multiple regression analysis examining the relative contribution of brand equity dimensions in predicting physician prescribing behavior while controlling for professional demographic variables. The overall model explains 63.7% of variance in prescribing frequency ($R^2=0.637$, Adjusted $R^2=0.624$), demonstrating substantial

predictive power and confirming brand equity as a major determinant of prescribing behavior. Brand awareness emerges as the strongest predictor (β=0.419, p<0.001), indicating that a one standard deviation increase in brand awareness corresponds to a 0.419 standard deviation increase in prescribing frequency, holding other variables constant. This finding supports the cognitive accessibility hypothesis wherein physicians preferentially prescribe brands that readily come to mind during clinical encounters. Perceived quality ranks as the second strongest predictor (β=0.379, p<0.001), underscoring that quality perceptions substantially influence prescribing independent of other brand equity dimensions. Brand loyalty demonstrates significant predictive power (β=0.351, p<0.001), reflecting the substantial role of prescribing habits and inertia in pharmaceutical decision-making. Brand associations show significant but weaker influence (β=0.149, p=0.022), suggesting that while physicians' mental connections between brands and therapeutic attributes contribute to prescribing, their impact is secondary to awareness, quality perceptions, and loyalty. Multicollinearity diagnostics reveal acceptable variance inflation factors (VIF ranging 1.15-2.12), indicating that intercorrelations among predictors do not unduly inflate standard errors or compromise coefficient estimates. Control variables (years of practice, specialty, practice setting) show non-significant effects, suggesting that brand equity influences prescribing relatively uniformly across professional contexts. The highly significant F-statistic (F=48.16, p<0.001) confirms overall model validity and rejects the null hypothesis of no relationship between predictors and prescribing behavior.

Table 4: Behavioral Economic Factors Mediating Brand Equity-Prescribing Relationship

Behavioral Economic Factor	Prevalence (% Influenced)	Mediation Effect (Indirect Effect)	95% CI	% of Total Effect
Availability Heuristic	78.5%	0.142	[0.086, 0.204]	23.7%
Anchoring Bias	64.0%	0.098	[0.052, 0.151]	16.3%
Social Proof	72.5%	0.126	[0.074, 0.186]	21.0%
Default Bias	56.5%	0.084	[0.041, 0.134]	14.0%
Status Quo Bias	68.0%	0.106	[0.061, 0.159]	17.7%
Combined Effect	-	0.556	[0.478, 0.638]	92.7%
Direct Effect	-	0.044	[-0.018, 0.108]	7.3%
Total Effect	-	0.600	[0.524, 0.672]	100.0%

Note: Mediation analysis conducted using bootstrapping procedure (5,000 samples)

Table 4 presents mediation analysis results examining how behavioral economic factors mediate the relationship between brand equity and prescribing behavior, providing evidence for the psychological mechanisms through which brand equity influences prescribing decisions. The availability heuristic demonstrates the strongest mediating effect (indirect effect = 0.142, 95% CI [0.086, 0.204]), accounting for 23.7% of the total brand equity effect on prescribing. This finding confirms that brand equity partially operates by increasing cognitive accessibility—physicians more readily prescribe brands with higher equity because these brands more easily come to mind during prescribing

moments. Social proof shows substantial mediation (indirect effect = 0.126, 95% CI [0.074, 0.186]), representing 21.0% of the total effect. This indicates that brand equity influences prescribing partially through perceived peer endorsement and conformity to professional norms, with physicians inferring that high-equity brands are more widely prescribed and therefore more appropriate choices. Status quo bias contributes significant mediation (indirect effect = 0.106, 95% CI [0.061, 0.159]), accounting for 17.7% of total effect, demonstrating that brand equity reinforces prescribing inertia and resistance to switching brands once prescribing patterns are established. Anchoring bias exhibits moderate mediation (indirect effect = 0.098, 95% CI [0.052, 0.151]), representing 16.3% of total effect, suggesting that physicians anchor on high-equity brands encountered during training or early clinical experience. Default bias shows smallest but significant mediation (indirect effect = 0.084, 95% CI [0.041, 0.134]), accounting for 14.0% of total effect, indicating that brand equity influences which drugs become default prescribing choices in routine clinical situations. Combined indirect effects account for 92.7% of the total brand equity effect on prescribing, while the direct effect (not mediated through behavioral economic factors) represents only 7.3% and is not statistically significant (95% CI includes zero). This pattern indicates nearly complete mediation, demonstrating that brand equity influences prescribing almost entirely through behavioral economic mechanisms rather than through rational, deliberative decision-making processes.

Table 5: Effectiveness of Behavioral Economic Interventions in Pharmaceutical Marketing

Intervention Type	Implementation Rate	Average Change in Target Behavior (%)	Effect Size (Cohen's d)	p-value	Sustainability (6-month follow-up)
Changing Default Settings	48.5%	+34.2% ± 12.6%	0.68	<0.001	76.3%
Social Reference Points	62.0%	+28.7% ± 14.2%	0.54	<0.001	68.5%
Commitment Devices	31.5%	+18.4% ± 16.8%	0.38	0.003	52.1%
Framing Effects	54.5%	+22.6% ± 13.4%	0.47	<0.001	61.2%
Simplification/Salience	58.0%	+19.8% ± 15.2%	0.41	0.001	58.7%
Loss Aversion Messaging	42.5%	+15.3% ± 17.4%	0.32	0.012	47.9%
Combined Interventions	28.0%	+42.8% ± 11.8%	0.84	<0.001	72.6%

Note: Data based on retrospective reports and experimental scenarios

Table 5 examines the effectiveness of behavioral economic interventions in pharmaceutical marketing contexts, quantifying impact on physician prescribing behavior. Changing default settings emerges as the most effective single intervention, producing an average 34.2% increase in target prescribing behaviors (effect size d=0.68, large effect) with high sustainability at six-month follow-up (76.3%). This finding demonstrates that EHR modifications setting preferred brands or formulations as default choices substantially influence prescribing through leveraging default bias

and reducing decision effort. Social reference points show substantial effectiveness with 28.7% average behavior change (d=0.54, medium-to-large effect), indicating that providing physicians with information about peer prescribing patterns or thought leader endorsements effectively influences behavior through social proof mechanisms. Implementation rate is relatively high (62.0%), suggesting feasibility and acceptability of this approach. Framing effects demonstrate moderate effectiveness (22.6% change, d=0.47), showing that how pharmaceutical information is presented emphasizing benefits versus risks, absolute versus relative effects, patient-centered versus clinical outcomes significantly impacts prescribing decisions. Simplification and salience strategies produce 19.8% average change (d=0.41), demonstrating that making preferred options more visible, accessible, and cognitively easy to process influences prescribing, though to a lesser extent than defaults or social references. Commitment devices show 18.4% change (d=0.38) but suffer from lower implementation rates (31.5%) and sustainability (52.1%), suggesting challenges in maintaining physician engagement with self-commitment strategies. Loss aversion messaging produces smallest effects (15.3% change, d=0.32) with modest sustainability (47.9%), indicating limited effectiveness of emphasizing negative consequences of non-preferred prescribing. Combined interventions utilizing multiple behavioral strategies demonstrate highest effectiveness (42.8% change, d=0.84, large effect) with good sustainability (72.6%), though implementation rates are lowest (28.0%) due to complexity. All interventions achieve statistical significance ($p \leq 0.012$), providing evidence that behavioral economic principles can effectively modify physician prescribing behavior when integrated into pharmaceutical marketing strategies.

6. DISCUSSION

This study provides empirical evidence for the significant relationship between pharmaceutical brand equity and physician prescribing behavior, demonstrating that this relationship is substantially mediated by behavioral economic factors. The findings contribute to both theoretical understanding and practical applications in pharmaceutical marketing and healthcare policy. The strong positive correlation (r=0.724) between overall brand equity and prescribing frequency confirms that pharmaceutical brand equity serves as a powerful predictor of physician behavior, explaining approximately 52% of variance in prescribing patterns. This finding extends brand equity theory into pharmaceutical contexts, demonstrating that despite physicians' professional training and evidence-based practice norms, brand-related perceptions substantially influence clinical decisions (Aaker, 1991; Keller, 2013). The strength of this relationship exceeds that typically observed in consumer goods contexts, potentially reflecting the high cognitive demands of medical practice where heuristics and simplified decision rules become particularly influential (Kahneman, 2011).

Among brand equity dimensions, perceived quality emerges as the strongest predictor in correlation analysis while brand awareness shows highest standardized regression coefficient in multivariate analysis. This apparent discrepancy reflects suppression effects common in multiple regression, where controlling for intercorrelated predictors reveals unique contributions. The prominence of brand awareness aligns with the availability heuristic framework—

physicians cannot prescribe brands they cannot recall, making cognitive accessibility a necessary precondition for prescription (Tversky & Kahneman, 1973). Pharmaceutical companies' substantial investments in promotional activities targeting brand awareness appear well-justified given its strong predictive power. Perceived quality's substantial influence validates the quality-price heuristic and confirms that physicians use brand signals to infer drug quality under information asymmetry (Venkataraman & Stremersch, 2007). Interestingly, perceived quality predicts prescribing independently of objective clinical evidence, suggesting that pharmaceutical branding creates quality perceptions beyond pharmacological properties. This finding raises important questions about evidence-based medicine ideals versus behavioral realities of clinical practice.

Brand loyalty's significant predictive power (β=0.351) demonstrates prescribing inertia and status quo bias, with physicians showing resistance to switching brands once prescribing patterns establish. This finding aligns with behavioral economics literature documenting strong status quo preferences across domains (Samuelson & Zeckhauser, 1988). From pharmaceutical marketing perspectives, this suggests that establishing initial brand loyalty during early physician career stages or product launches offers long-term competitive advantages through subsequent behavioral lock-in. The mediation analysis provides novel insights into psychological mechanisms underlying brand equity's influence on prescribing. The finding that behavioral economic factors account for 92.7% of brand equity's total effect with availability heuristic, social proof, and status quo bias as primary mediators demonstrates that brand equity operates predominantly through non-rational cognitive processes rather than deliberative evaluation. This nearly complete mediation challenges purely rational models of physician decision-making and supports dual-process theories proposing that clinical decisions combine intuitive (System 1) and analytical (System 2) thinking, with System 1 processes often dominating in routine prescribing contexts (Kahneman, 2011).

The availability heuristic's strong mediation (23.7% of total effect) confirms that brand equity primarily influences prescribing by increasing cognitive accessibility. Pharmaceutical marketing activities successfully increase brand salience, making high-equity brands more easily recalled during prescribing moments. This mechanism operates automatically without conscious deliberation, explaining why physicians often underestimate marketing influence on their own behavior despite recognizing general effects (Grande et al., 2009). Social proof's substantial mediation (21.0%) demonstrates that physicians infer prescribing appropriateness from perceived peer behavior and professional norms. Brand equity signals consensus high-equity brands are perceived as more widely prescribed and endorsed, triggering conformity pressures. This finding has implications for key opinion leader (KOL) programs and thought leader strategies commonly employed in pharmaceutical marketing. The effectiveness of social reference point interventions (28.7% behavior change) further validates this mechanism.

The behavioral economic intervention analysis demonstrates practical applications of these theoretical insights. Default setting changes emerge as most effective (34.2% behavior change), confirming default bias's power documented extensively in behavioral economics literature (Thaler & Sunstein, 2008). For pharmaceutical companies,

this suggests strategic importance of formulary positioning, EHR integration, and prescribing system design. However, ethical considerations arise regarding appropriate versus manipulative uses of defaults, particularly when defaults favor more expensive branded drugs over equally effective generics. Social reference point interventions' effectiveness (28.7% change) validates social proof mechanisms and suggests that marketing strategies emphasizing peer prescribing data, thought leader endorsements, and conference presentations can effectively influence behavior. Combined interventions show highest effectiveness (42.8% change) but face implementation challenges, suggesting that sophisticated multi-modal strategies require careful design and execution.

The finding that pharmaceutical marketing exposure shows moderate but significant correlation with prescribing ($r=0.473$) while being largely mediated through brand equity development clarifies marketing mechanisms. Marketing does not directly persuade through rational argumentation but rather builds brand equity, which subsequently influences prescribing through behavioral economic mechanisms. This indirect pathway suggests that traditional marketing effectiveness metrics focusing on immediate post-exposure behavior change may underestimate long-term cumulative effects through brand equity development. These findings must be interpreted considering study limitations. The cross-sectional design precludes causal inference while brand equity predicts prescribing, reverse causality (prescribing experience building brand equity) or third variables cannot be definitively ruled out. Longitudinal designs tracking brand equity development and prescribing changes over time would strengthen causal conclusions. Self-report measures of prescribing behavior may suffer from social desirability bias or imperfect recall, though validation against prescription databases would be ideal.

The study sample, while reasonably representative, focuses on Indian metropolitan physicians and may not generalize to rural settings, other countries, or different healthcare systems. Cultural factors and healthcare structures may moderate brand equity-prescribing relationships. Indian healthcare's predominantly private, out-of-pocket payment structure may amplify brand equity effects compared to systems with stricter formulary controls or generic substitution mandates. The research also relies on physician self-reports of behavioral economic influences, which may underestimate actual effects given documented blind spots regarding cognitive biases (Grande et al., 2009). Experimental designs directly manipulating brand information and measuring prescribing behavior would provide more definitive evidence for causal mechanisms. Important ethical implications emerge from these findings. The substantial influence of brand equity and behavioral economic factors on prescribing raises concerns about undue marketing influence potentially compromising evidence-based practice and increasing healthcare costs. If prescribing decisions reflect cognitive biases exploited by marketing rather than purely rational evaluation of clinical evidence, patient welfare and healthcare system efficiency may suffer (Spurling et al., 2010; DeJong et al., 2016).

However, the behavioral economic perspective also suggests constructive applications. If physicians inevitably employ heuristics and exhibit biases in clinical decisions, strategically designing choice architectures to nudge prescribing toward evidence-based, cost-effective options represents a potentially beneficial intervention (Patel et al.,

2018; Wang & Groene, 2020). Healthcare systems could leverage default settings, social reference points, and other behavioral strategies to promote rational prescribing while respecting physician autonomy. Future research should examine several important questions. Longitudinal studies tracking brand equity development and prescribing evolution would clarify causal dynamics. Comparative research across healthcare systems and cultures would establish boundary conditions for observed relationships. Experimental designs manipulating specific brand equity dimensions and behavioral economic factors would definitively test causal mechanisms. Investigation of moderating factors specialty-specific effects, individual differences in susceptibility to biases, organizational contexts would refine understanding of when and for whom brand equity most strongly influences prescribing. Research should also examine ethical frameworks for distinguishing appropriate marketing and choice architecture design from manipulation. What principles should govern pharmaceutical companies' use of behavioral insights? How can healthcare systems harness behavioral economics for social benefit while protecting against commercial exploitation? These normative questions require interdisciplinary engagement among medicine, marketing, ethics, and health policy.

7. CONCLUSION

This study demonstrates that pharmaceutical brand equity substantially influences physician prescribing behavior, with this relationship predominantly mediated through behavioral economic factors including availability heuristic, social proof, status quo bias, and anchoring. Brand equity explains approximately 52% of variance in prescribing frequency, with brand awareness, perceived quality, and brand loyalty emerging as strongest predictors. Behavioral economic factors account for 92.7% of brand equity's total effect on prescribing, indicating that brand influence operates primarily through non-rational cognitive processes rather than deliberative evaluation. These findings contribute to theoretical integration of brand equity and behavioral economics frameworks, demonstrating that understanding pharmaceutical marketing effectiveness requires considering both brand content (what physicians know and feel about brands) and decision processes (how cognitive biases transform brand knowledge into prescribing behavior). Pharmaceutical brand equity cannot be fully understood without acknowledging behavioral economic mechanisms through which it influences decisions. Practical implications suggest that pharmaceutical companies can enhance marketing effectiveness by systematically building brand equity dimensions while leveraging behavioral economic principles including defaults, social proof, and cognitive accessibility. However, ethical considerations regarding appropriate versus manipulative marketing practices require careful attention, with potential roles for healthcare policy in establishing boundaries and harnessing behavioral insights for socially beneficial purposes.

The research underscores the complex interplay between professional expertise, clinical evidence, cognitive limitations, and commercial influence in shaping prescribing behavior. While physicians aspire to evidence-based practice, behavioral realities demonstrate substantial influence from brand perceptions and decision heuristics. Acknowledging these realities rather than maintaining idealized views of purely rational clinical decision-making

enables more effective strategies for promoting rational prescribing, controlling healthcare costs, and optimizing patient outcomes while respecting the cognitive and practical constraints of clinical practice.

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