(June 2026). Customer Well-Being Through Customer Engagement: Examining Mobile Fitness Applications Through the Lens of Self-Determination Theory
***International Journal of Economic Perspectives*,*20*(06) 39 -57**
ISSN: 1307-1637 ABDC
Retrieved from https://ijeponline.com/index.php/journal

Customer Well-Being Through Customer Engagement: Examining Mobile Fitness Applications Through the Lens of Self-Determination Theory

[1]**Vibhu Johar,** Sr. Assistant Professor, Model Institute of Engineering and Technology, Jammu, J&K, India
Email: joharvibhu23@gmail.com

[2]**Dr. Priyanka Sharma,** Associate Professor, Institution: Model Institute of Engineering and Technology, Jammu, J&K, India
Email: Priyankasharma.bhu@gmail.com

Abstract

In the current digital health landscape, mobile fitness applications have emerged as a pivotal medium for health promotion and consumer interaction. While such platforms have proliferated rapidly, the mechanisms by which sustained post-adoption engagement shapes user well-being remain insufficiently examined. Drawing on Self-Determination Theory (SDT) as its theoretical anchor, this investigation empirically explores how customer engagement, conceptualised across three interrelated psychological dimensions: enthusiastic participation, conscious attention, and social connection, affects the well-being of fitness application users in India. Survey data were collected from 400 users and analysed using PLS-SEM. The results demonstrate that customer engagement has a significant positive impact on customer well-being. The study enriches the scholarly literature on digital health engagement and provides developers and marketing practitioners with actionable design principles that prioritise psychological need satisfaction, sustained engagement, and improved user well-being.

Keywords: Customer Engagement, Customer Well-Being, Fitness Applications, Self-Determination Theory, PLS-SEM, Mobile Applications, India

1. Introduction

The rapid advancement of digital technologies has fundamentally transformed how people manage health, access consumer services, and achieve personal objectives. Mobile applications, in particular, have become indispensable enablers that integrate utility and convenience across virtually every domain of modern life (Kshirsagar & Ingle, 2025). The global mobile application market is forecast to surpass USD 756 billion by 2027, expanding at a compound annual growth rate (CAGR) of 8.58% between 2022 and 2027 (Grand View Research, 2025). India, home to the second-largest base of active smartphone users worldwide, has experienced remarkable growth in application adoption driven by greater affordability of handsets, broader internet penetration, and evolving consumer preferences. India's digital health market alone is projected to reach USD 11.14 billion in 2026, underscoring the country's accelerating shift toward digital health and wellness infrastructure (Fortune Business Insights, 2026).

Within this broader digital expansion, the fitness sector has emerged as one of the most dynamically growing segments. India's fitness application market is projected to grow at an annual rate of 8.46% from 2025 through 2028 (Fitness Apps Market Report, 2025–2035), a trajectory that was further reinforced during the COVID-19 pandemic, which heightened reliance on home-based health and wellness technologies (Statista, 2024). Today, fitness applications serve as comprehensive platforms encompassing goal setting,

Submitted: 27 April 2026, Revised: 09 May 2026, Accepted: 25 May 2026,

personalised workout planning, performance tracking, and motivational support, positioning them as vital instruments for fostering long-term physical activity adherence (Southcott & Jooste, 2024). Their growing prevalence has drawn increasing academic attention (Beldad & Hegner, 2018), although the field is still in its formative stages from a research standpoint (Gupta, 2025; Liu & Avello, 2021).

Prior research in this domain has concentrated primarily on adoption intention and technology acceptance (Li, Wang, & Darweesh, 2025; Aboelmaged et al., 2021), while comparatively less attention has been directed toward the post-adoption phase—that is, how users continue to engage with fitness applications over time and what this means for their overall well-being (Milne-Ives et al., 2023; Gupta, 2025; Ariff et al., 2021; Thanthrige & Wickramasinghe, 2026). There exists a considerable gap in understanding how differing intensities and facets of engagement shape long-term well-being among users of digital health tools, a shortcoming that recent systematic evidence continues to underscore (Thanthrige & Wickramasinghe, 2026). Customer engagement, a construct that spans cognitive, emotional, and behavioural domains of investment, has predominantly been examined from an organisational vantage point (Vivek et al., 2012). Its connection to subjective well-being, particularly as experienced by consumers, has remained an underexplored area (Hollebeek et al., 2022; Kumar et al., 2021; Hollebeek & Belk, 2021). Milne-Ives et al. (2023) and Arora et al. (2017) have expressly identified this lacuna and called for a dedicated inquiry into engagement within mobile application settings.

To bridge this gap, the present investigation examines how customer engagement—operated through three dimensions: enthusiastic participation, conscious attention, and social connection (Vivek et al., 2014) relates to customer well-being in the context of mobile fitness applications. These three engagement facets are theoretically grounded in SDT, mapping respectively onto the needs for competence (enthusiastic participation), relatedness (social connection), and autonomy (conscious attention). The study is anchored in Self-Determination Theory (SDT) (Deci & Ryan, 1985; Ryan & Deci, 2020; Hindman et al., 2026), a rigorously validated motivational framework that holds that psychological flourishing occurs when these three needs are fulfilled. SDT is particularly well-suited to the present context because it offers a theoretically robust lens for understanding how digitally mediated experiences can cultivate intrinsic motivation, sustain engagement, and foster favourable well-being outcomes (Roy et al., 2023). The study addresses two primary research questions: (1) Does customer engagement positively predict customer well-being? (2) How do the three CE dimensions—enthusiastic participation, conscious attention, and social connection—individually relate to customer well-being in mobile fitness application contexts?

This paper employs PLS-SEM to empirically examine these questions, using data collected from active Indian fitness app users in the context of growing strategic relevance given India's position as one of the fastest-growing digital health markets globally. Theoretically, the study extends SDT to the mobile fitness application domain and deepens understanding of the post-adoption engagement well-being relationship. Practically, it provides evidence-based design guidance to developers and marketers on building features that promote user autonomy, strengthen social bonds, and foster competence, ultimately supporting enhanced user well-being.

Submitted: 27 April 2026, Revised: 09 May 2026, Accepted: 25 May 2026,

2. Literature Review and Hypothesis Development

2.1 Theoretical Foundation: Self-Determination Theory

Self-Determination Theory (SDT) is a broad macro-level theory concerned with human motivation, personality development, and well-being, and it constitutes the theoretical pillar of this study (Deci & Ryan, 1985; Martela, 2020). The theory envisions that human beings are inherently driven by a continuum of motivational states that shape their actions and degree of sustained involvement. At the core of SDT is the contention that three foundational psychological needs—autonomy (the experience of volitional choice), relatedness (a sense of belonging and interpersonal connection), and competence (the perception of efficacy and mastery)—are universally necessary for psychological development, sustained engagement, and personal flourishing (Deci & Ryan, 1985; Ryan & Deci, 2000, 2019; Hashmi et al., 2021).

SDT has been deployed across a wide range of disciplines, encompassing education, healthcare, workplace behaviour, sport sciences, and digital marketing (Ajzen, 1991; Gilal et al., 2019; Guo et al., 2023; Ryan & Vansteenkiste, 2023). In marketing scholarship, the three psychological needs operate as motivational levers that shape consumer behavioural intentions. When digital products, services, and experiences are engineered to satisfy these needs, marketers can activate intrinsic motivation, build long-term loyalty, and improve customer well-being and satisfaction (Gilal et al., 2019).

Empirical scholarship affirms SDT's value in illuminating the nexus between psychological need fulfillment, customer engagement, and subjective well-being across digital interaction platforms—such as branded applications, wearables, and e-commerce environments (Roy et al., 2023). A consistent body of evidence indicates that need satisfaction promotes regular use, deep platform involvement, and positive behavioural outcomes (Reeve, 2012; Japutra, 2022). In the specific domain of mobile fitness applications, this theoretical framework is especially apt: enthusiastic participation is activated by interactive challenges, customisable exercise regimens, and tailored feedback; conscious attention is reinforced through self-tracking instruments, health education content, and evidence-based behavioural prompts; and social connection is cultivated through community forums, leaderboards, and peer-sharing capabilities (Hu et al., 2023; Joshi et al., 2025; Vivek et al., 2014). When these needs are fulfilled, users develop heightened intrinsic motivation, reflected in more consistent app engagement, greater feature exploration, and deeper emotional attachment to the platform (Stancu et al., 2022).

This study accordingly employs SDT as an organising framework to explore the impact of satisfying psychological needs through fitness app features, which sustains engagement and ultimately promotes user well-being, positioning SDT as both a theoretically coherent and empirically robust foundation for the present investigation.

2.2 Customer Engagement

Customer engagement has established itself as a cornerstone construct in contemporary marketing scholarship, attracting research interest across a diversity of academic disciplines (Brodie et al., 2011; Hollebeek et al., 2022; Lim et al., 2022; Soltani Nejad et al., 2022). Conceptualisations of the construct have varied: whereas investigations in social and commercial settings have at times treated it as a unidimensional phenomenon (Shen et al., 2019), the broader marketing literature has more widely adopted a

Submitted: 27 April 2026, Revised: 09 May 2026, Accepted: 25 May 2026,

multidimensional framework encompassing emotional, cognitive, and behavioural components (Hollebeek et al., 2014; Vivek et al., 2014; Harrigan et al., 2018).

Van Doorn et al. (2010) conceptualise customer engagement as a behavioural expression of a consumer's motivational orientation toward a brand or organisation, extending well beyond transactional exchanges to encompass word-of-mouth communication, referrals, peer assistance, and user-generated content creation (Yang et al., 2024). In relation to mobile application, Kim et al. (2013) identified three motivational dimensions of engagement—hedonic, social, and functional—that underpin the diverse activities and intentions of users. Extending this work, Vivek et al. (2014) identified enthusiastic participation, social connection, and conscious attention as the three core dimensions characterising customer engagement in mobile settings. Enthusiastic participation conveys the intensity of emotional involvement during interaction; social connection reflects a user's engagement with others within the same experience; and conscious attention signifies the degree of cognitive focus directed toward the engagement.

Vivek et al. (2012) further conceptualised customer engagement as a multidimensional relational construct encompassing emotional, cognitive, social, and behavioural elements, with consumer involvement and participation as primary antecedents, and outcomes including value creation, word-of-mouth, brand loyalty, and brand community membership. Within a service-dominant logic perspective, customer engagement spans both online and offline activities that shape consumer purchase intentions (Viswanathan et al., 2018). The rapid advance of digital technologies has broadened the scope of engagement research to encompass artificial intelligence, augmented reality, digital content marketing, and mobile applications (Hollebeek & Macky, 2019; Huang & Rust, 2021; Soltani Nejad et al., 2022).

Despite the richness of engagement scholarship, empirical inquiry into user engagement within mobile fitness application contexts remains sparse (Liu et al., 2025; Joshi et al., 2025). This investigation addresses that gap by investigating the engagement–well-being relationship through an SDT lens.

2.3 Customer Well-Being

The aspiration toward well-being is a fundamental dimension of human experience, particularly within the sphere of consumption (Bhardwaj & Kalro, 2024). Within psychological science, well-being remains a conceptually contested term; researchers frequently use happiness, life satisfaction, and quality of life interchangeably (Uysal et al., 2016). Well-being may be attained through the meeting of both essential and higher-order psychological needs (Falter & Hadwich, 2020). Ryan and Deci (2000) delineate three core components of psychological well-being: autonomy, relatedness, and competence—precisely the needs at the heart of SDT.

Contemporary theoretical frameworks understand well-being as encompassing both cognitive dimensions (e.g., evaluations of life satisfaction) and affective dimensions (e.g., emotional experiences and positive affect) (Diener & Sim, 2024). Whereas affective responses are more susceptible to momentary fluctuations, cognitive assessments tend to remain relatively consistent over time (Andrews & McKennell, 1980; Keyes et al., 2002). Zhao and Wei (2019) characterise well-being in consumer contexts as a cognitive and emotional state—marked by positive affect, satisfaction with life, and perceived quality of life—arising from consumption experiences. Crisp (2021) and Tov (2018) further contend that well-being encompasses

Submitted: 27 April 2026, Revised: 09 May 2026, Accepted: 25 May 2026,

every dimension that renders life meaningful, with favourable evaluations contributing to loyalty, psychological health, and positive word-of-mouth behaviour.

Digital platforms have become deeply woven into everyday life, substantially influencing consumer well-being. The investigation of how digital engagement affects well-being has consequently become a vital area of scholarly enquiry (Harwood & Anglim, 2019; Kemppainen & Paananen, 2024). A substantial and growing body of literature demonstrates that consumer well-being can be enhanced through meaningful engagement with digital platforms, thereby positioning customer engagement as a primary driver of well-being outcomes (David et al., 2018; Henkens et al., 2021; Lee et al., 2017). Within mobile fitness application contexts specifically, recent evidence confirms that app experiences mediated by joy, perceived usefulness, and social connectivity significantly enhance users' overall well-being, with Self-Determination Theory providing the motivational scaffolding for these effects (Joshi et al., 2025). Lee et al. (2025) further demonstrate that platform engagement shapes users' self-concept and subjective well-being through mechanisms of self-expansion and self-extension, underscoring the psychological depth of digital engagement outcomes. However, the relationship between fitness app use and well-being is not uniformly positive: Sheen et al. (2025) identify several unintended consequences of popular commercial fitness applications—including social comparison, body-image anxiety, and exercise compulsion—highlighting the need for design interventions that balance engagement with psychological safety. Peters et al. (2018) proposed a theoretical framework showing that technology design, mediated by SDT-grounded motivation and sustained engagement, shapes overall user well-being. When digital engagement satisfies the needs for competence and relatedness, users are intrinsically motivated and correspondingly experience greater well-being—an effect most evident among users who feel capable, self-directed, and socially embedded in their platform interactions. Liu, Zhang, and Fang (2025) extend this line of inquiry, demonstrating that fitness app affordances drive sustained engagement through health empowerment, reinforcing the pathway from feature design to long-term well-being outcomes.

2.4 Mobile Applications and Customer Engagement

The global mobile application market has undergone dramatic expansion. Worldwide app downloads across iOS and Google Play reached approximately 149 billion in 2025, a 0.8% year-on-year increase equivalent to nearly 284,000 app installations per minute (Sensor Tower, 2026). Global in-app-purchase revenues surpassed USD 167 billion in 2025—a 10.6% year-on-year rise and the fastest growth rate since 2021—while total app-economy revenues (consumer spending plus mobile advertising) are projected to reach USD 613 billion in 2025 (Statista, 2025). India retained its position as the world's foremost app-download market, recording approximately 25.5 billion downloads in 2025—a rebound from 24.6 billion in 2024—driven in large part by the rapid adoption of generative AI assistants and short-form video platforms (Sensor Tower, 2026). Organisations have increasingly come to regard mobile applications as strategic instruments for cultivating customer engagement and generating sustained long-term value (Lin & Huang, 2024).

Research consistently affirms that the impact of mobile applications depends not only on their technical attributes but equally on their ability to foster deep and meaningful user engagement (Kim et al., 2013). Scholars in services marketing have demonstrated that digital services can enhance individual outcomes by influencing motivation, habit formation, achievement experiences, and subjective well-being

Submitted: 27 April 2026, Revised: 09 May 2026, Accepted: 25 May 2026,

(Hsiao et al., 2016; Jeno et al., 2019). Emerging perspectives underscore that consumer engagement should be understood not as a static outcome but as an evolving, dynamic process that continuously influences the psychological, emotional, and behavioural dimensions of user well-being (Lee et al., 2025; Rather & Sharma, 2017), underscoring the importance of conceptualising customer engagement as a multidimensional and continuous influence on user outcomes.

2.5 Hypotheses Development

Drawing on the SDT framework and the foregoing review of empirical literature, the present study posits the following hypotheses. H1 addresses the overarching CE–CWB relationship, while H1a through H1c examine the independent contribution of each CE dimension to customer well-being:

H1: Customer engagement exerts a direct positive influence on customer well-being.

H1a: Conscious attention positively influences the well-being of customers

H1b: Enthusiastic participation positively impacts the well-being of customers

H1c: Social connection positively influences customer well-being.

3. Research Methodology

This study adopts a quantitative cross-sectional research design. Primary data were gathered from active mobile fitness application users across India through a structured online questionnaire distributed via social media channels, university networks, and fitness community forums. A purposive sampling approach was employed to ensure respondent eligibility: participants were required to (a) own a smartphone and (b) have actively used a mobile fitness application like Google Fit, cult. Fit, my fitness pal etc for a minimum of three months, thereby guaranteeing sufficient experiential basis for evaluating engagement and well-being. Out of 428 responses, 400 responses were retained after the exclusion of incomplete and inconsistent responses, yielding a usable response rate of 93.5%.

The questionnaire was alienated into two sections. The first section elicits demographic details (age, gender, and occupational status). The second comprised scale items measuring the study constructs. Customer engagement (CE) was operationalised as a second-order reflective–reflective construct with three first-order dimensions adapted from Vivek et al. (2014): enthusiastic participation (nine items; e.g., "I am enthusiastic about using this fitness app"), conscious attention (six items; e.g., "I pay a lot of attention to this fitness app"), and social connection (three items; e.g., "Using this app connects me with others who share my fitness goals"). Customer well-being (CWB) was assessed with five items of well-being associated with fitness app usage, drawn from Peters et al. (2018) and Falter and Hadwich (2020). A seven-point Likert scale, from 1 (strongly disagree) to 7 (strongly agree), was used for each item.

To address common method bias (CMB)—a concern inherent to single-source self-report designs—several procedural safeguards were implemented, including anonymity assurances, randomisation of item order, and diversity of response formats (Podsakoff et al., 2003). A post hoc Harman's single-factor test indicated that the largest extracted factor explained 28.7% of total variance, comfortably below the 50% threshold, confirming that common method bias does not pose a meaningful threat to the validity of the findings.Data was analysed using Smart PLS 4.0. PLS-SEM was selected because of its appropriateness for

Submitted: 27 April 2026, Revised: 09 May 2026, Accepted: 25 May 2026,

theory-extending research with hierarchical constructs, its capacity to accommodate non-normally distributed data, and its established performance with samples of moderate size (Hair et al., 2022). The analytical procedure proceeded in two stages following Hair et al. (2019): first, the measurement model was evaluated across indicator reliability, internal consistency, convergent validity, and discriminant validity; second, the structural model was estimated using bootstrapping with 5,000 resamples to test the hypothesised paths.

4. Results and Analysis

4.1 Descriptive Statistics

A total of 400 usable responses were obtained. The sample comprised 188 male respondents (47.0%) and 212 female respondents (53.0%). Regarding age distribution, the 25–34 years cohort represented the largest segment at 40.0%, followed by the 18–24 years group (35.3%), the 35–44 years group (18.0%), and those aged 45–54 years (6.8%). In terms of occupational status, salaried employees constituted the largest category (43.0%), followed by students (38.0%) and homemakers (19.0%). Complete demographic details are provided in Table 1.

Table 1: Demographic Profile

Category	Sub-Category	Number	Percentage
Gender	Male	188	47.0%
	Female	212	53.0%
	Total	400	100%
Age	18–24 years	141	35.3%
	25–34 years	160	40.0%
	35–44 years	72	18.0%
	45–54 years	27	6.8%
	Total	400	100%
Occupation	Student	152	38.0%
	Housewife	77	19.0%
	Service	172	43.0%
	Total	400	100%

4.2 First-Order Measurement Model Assessment

Assessment of the PLS-SEM measurement model proceeded in two sequential stages, progressing from the lower-order construct (LOC) to the higher-order construct (HOC) level. Evaluation of LOC model followed the criteria established by Hair et al. (2019, 2022), examining indicator reliability (factor loadings), internal consistency (composite reliability; CR), convergent validity (average variance extracted; AVE), and discriminant validity. All indicator loadings were more than 0.70 criterion (Sarstedt et al., 2017), and all AVE values surpassed the 0.50 minimum standard (Hair et al., 2022), establishing satisfactory convergent validity at the first-order level. Full measurement model results appear in Table 2, Figure 1.

Submitted: 27 April 2026, Revised: 09 May 2026, Accepted: 25 May 2026,

Table 2: Reliability and Validity of Lower-Order Constructs

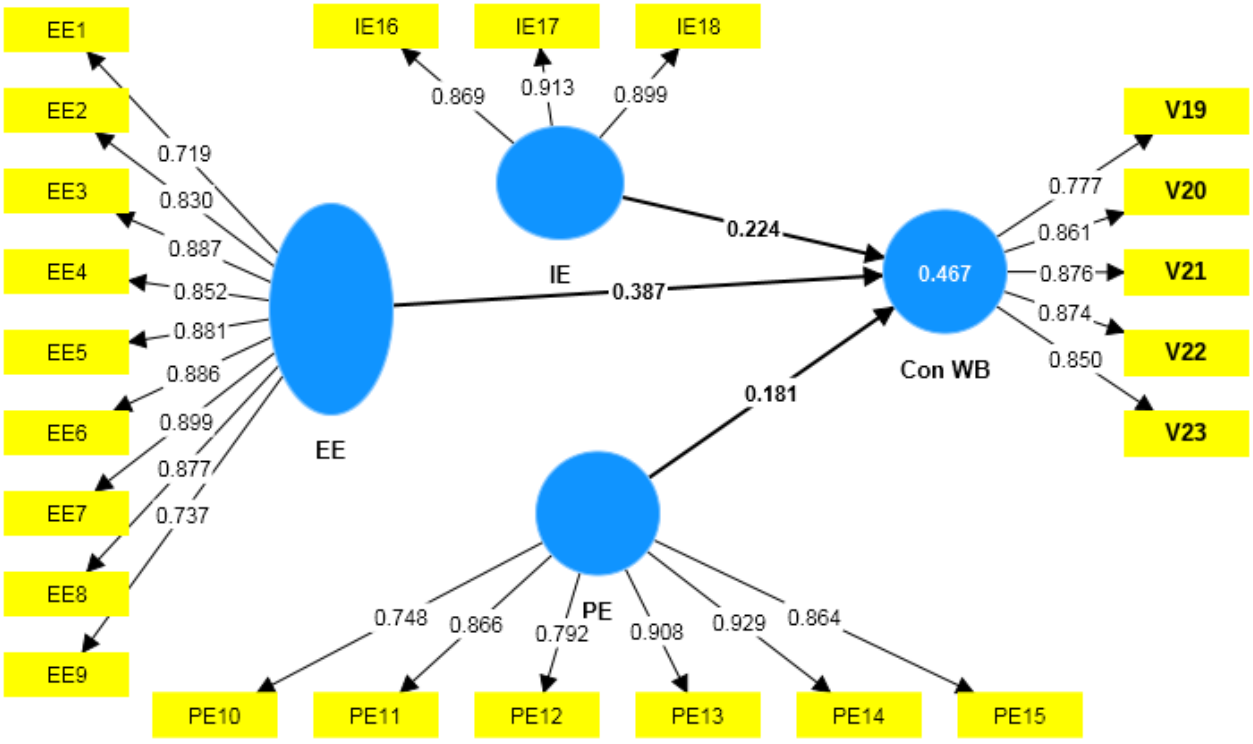
Construct	Items	Factor Loadings	Cronbach's Alpha	Composite Reliability	AVE
Consumer Wellbeing	V19–V23	0.777–0.876	0.903	0.928	0.720
Enthusiastic Participation (EE)	EE1–EE9	0.719–0.899	0.949	0.947	0.711
Conscious Attention (PE)	PE10–PE15	0.748–0.929	0.926	0.941	0.728
Social Connection (IE)	IE16–IE18	0.869–0.913	0.875	0.923	0.799

Discriminant validity among the first-order constructs was evaluated using the Heterotrait–Monotrait (HTMT) correlation ratio. All HTMT values remained below the recommended threshold of 0.85 (Henseler et al., 2015), confirming acceptable discriminant validity across all constructs (see Table 3), and supporting the suitability of the LOC measurement model for subsequent higher-order analysis.

Table 3: Discriminant Validity (HTMT Ratios) — First-Order Constructs

	Consumer WB	EE	IE	PE
Consumer WB	—			
EE	0.661	—		
IE	0.592	0.581	—	
PE	0.587	0.737	0.601	—

Figure 1: Lower-Order (First-Order) PLS-SEM Model



Submitted: 27 April 2026, Revised: 09 May 2026, Accepted: 25 May 2026,

4.3 Higher-Order Measurement Model Assessment

The HOC measurement model was assessed using the same Hair et al. (2019, 2022) guidelines. The HOC latent variable, Customer Engagement, was specified as a reflective-reflective construct with its three first-order dimensions serving as manifest indicators. Loadings for the HOC (derived from the LOC latent variable scores) exceeded 0.70, and Average variance extracted values surpassed 0.50, verifying convergent validity at the second-order level (Table 4). The HTMT ratio between Customer Engagement and Consumer Wellbeing was 0.782—below the 0.85 threshold—establishing discriminant validity at the HOC level (Table 5).

Table 4: Reliability and Validity of Higher-Order Constructs

Construct	Cronbach's Alpha	Composite Reliability	AVE
Customer Engagement	0.814	0.890	0.730
Consumer Wellbeing	0.903	0.928	0.720

Table 5: Discriminant Validity (HTMT Ratios) — Higher-Order Constructs

	Consumer WB	Customer Engagement
Consumer WB	—	
Customer Engagement	0.782	—

4.4 Structural Model Assessment

Potential multicollinearity was examined prior to structural model evaluation using variance inflation factor (VIF) analysis. VIF values across all constructs ranged between 1.432 and 2.918, well beneath the accepted cut-off of 5.0 (Hair et al., 2019; O'Brien, 2007), confirming the absence of problematic collinearity in the model.

Overall model fit was gauged using the standardised root mean square residual (SRMR). The SRMR value of 0.077 satisfies the conservative 0.08 threshold (Hair et al., 2022) and is comfortably within the more widely accepted 0.10 criterion (Hu & Bentler, 1999), with the overall pattern of fit indices supporting good model fit.

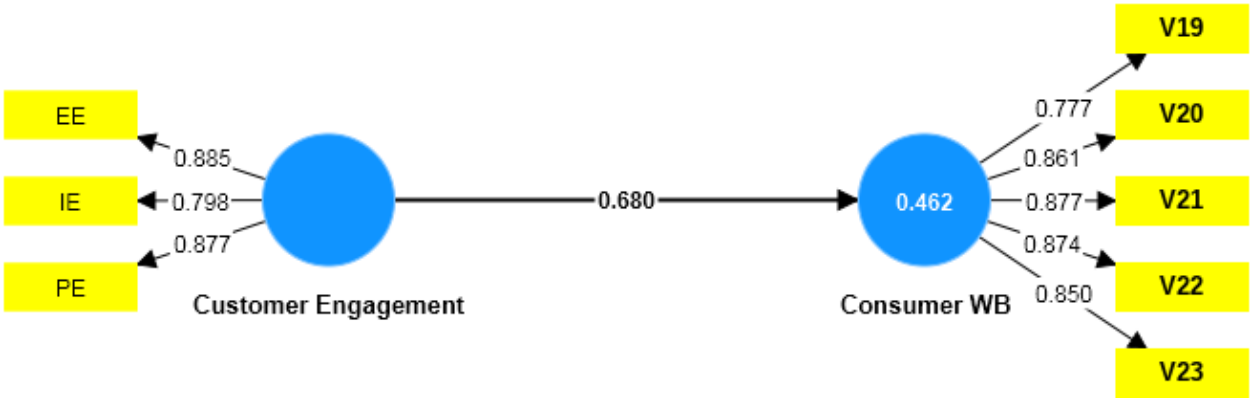
Hypothesis testing was performed through bootstrapping (5,000 resamples) in SmartPLS, yielding path coefficients, t-statistics, p-values, and bootstrap confidence intervals (Wong, 2015). A two-tailed significance level of 5% ($p < 0.05$, $t > 1.96$) was used throughout. Structural model results are reported in Table 6, Figure 2 .

Table 6: Structural Model Assessment Results

Hypothesis	Relationship	B	t-Stat	p-Value	Decision	R^2	f^2	Effect
H1	Customer Engagement → Consumer WB	0.685	19.042	0.000	Supported	0.469	0.883	Large

Submitted: 27 April 2026, Revised: 09 May 2026, Accepted: 25 May 2026,

Figure 2: Higher-Order (Second-Order) PLS-SEM Structural Model



The path from Customer Engagement to Consumer Wellbeing was statistically significant (β = 0.680, t = 15.135, p < 0.001), presenting a strong empirical support for H1. The coefficient of determination (R^2) stood at 0.462, indicating that Customer Engagement explains approximately 46.2% of the variance in Consumer Wellbeing—a moderate-to-substantial level of explanatory power by Chin's (1998) benchmarks.

The effect size (f^2) was 0.883, comfortably exceeding the 0.35 threshold associated with a large effect (Cohen, 1988; Chin & Todd, 1995), underscoring the substantial practical significance of customer engagement as a determinant of user well-being in the fitness application context. The sub-hypotheses H1a, H1b, and H1c were also supported with Path coefficients of .181, .38 and .22 at P<.05. Given that customer engagement was specified as a second-order construct, the three first-order dimensions (enthusiastic participation, conscious attention, and social connection) serve as determinants of the higher-order CE construct rather than operating as independent predictors of CWB. Their individual contributions to CWB are accordingly channelled through the CE latent variable, as reflected in the strong HOC loadings: enthusiastic participation (λ = 0.88), social connection (λ = 0.798), and conscious attention (λ = 0.877). Since all three loadings exceed 0.70, each dimension contributes substantially to CE and, by extension, to customer well-being. H1a, H1b, and H1c are therefore directly and indirectly supported through the confirmed higher-order relationship (H1).

5. Discussion

The findings of this study provide compelling support for the central proposition that customer engagement (CE) significantly and positively shapes customer well-being (CWB) in the context of mobile fitness applications (H1: β = 0.685, t = 19.042, p < 0.001). The large effect size (f^2 = 0.883) and the substantial proportion of explained variance (R^2 = 46.9%) collectively indicate that engagement is not an ancillary correlate of well-being but rather a primary mechanism through which fitness applications yield meaningful psychological and emotional benefits for their users. These findings accord with the wider digital engagement literature, which is increasingly positioning CE as a causal antecedent rather than a mere correlate of consumer well-being (Henkens et al., 2021; Lee et al., 2025).

The results find strong theoretical grounding in SDT. As Deci & Ryan (1985) and Ryan & Deci (2000) propose, the fulfilment of the psychological needs for autonomy, competence, and relatedness promotes intrinsic motivation and enhances well-being. In this study, the three CE dimensions map directly onto these needs. Enthusiastic participation the highest-loading dimension (λ = 0.885) corresponds to competence

Submitted: 27 April 2026, Revised: 09 May 2026, Accepted: 25 May 2026,

fulfilment through active goal pursuit, mastery experiences, and individualised training feedback. Conscious attention (λ = 0.877) reflects the autonomy need through deliberate, self-directed engagement with app features and health-related choices. Social connection (λ = 0.798) addresses relatedness through community interaction, shared progress monitoring, and peer accountability. When all three needs are simultaneously met through app engagement, their cumulative impact on well-being is substantial, as evidenced by the large f^2 value. These findings align with Peters et al. (2018) and Hu et al. (2023), both of whom demonstrated that technology-mediated need satisfaction is a potent driver of both sustained engagement and positive well-being.

The Indian contextual backdrop offers additional interpretive depth. As the world's leading app-download market, recording 25.5 billion downloads in 2025 (Sensor Tower, 2026), with a rapidly expanding fitness application segment (Fitness Apps Market Report, 2025), India represents a strategically significant context for this investigation. The sample's predominantly young, urban, and service-employed profile reflects the core demographic of Indian fitness app users, suggesting that the engagement–well-being pathway identified here is broadly representative of this important market. These findings extend prior India-centred digital engagement research by demonstrating that the motivational mechanisms underpinning consumer engagement possess both statistical significance and substantive impact in a high-growth emerging market context.

The findings carry concrete, evidence-grounded implications for multiple stakeholders across the fitness application ecosystem. For developers and product designers, the overriding message is that psychological need fulfilment, not merely feature richness or usage frequency—should anchor design decisions. Because enthusiastic participation emerged as the strongest CE dimension (λ = 0.889), design investment should prioritise competence-building experiences: adaptive challenge systems that scale with user fitness levels, real-time performance feedback, milestone-based reward structures, and personalised coaching modules that foster mastery. The high loading of conscious attention (λ = 0.881) signals that autonomy-supportive elements carry near-equal weight: customisable goal interfaces, self-monitoring dashboards, and contextually relevant health content that empowers users to make deliberate, self-directed choices deserve parallel attention. Social connection (λ = 0.802), while the lowest-loading dimension, still constitutes a significant pathway: peer-accountability features, community challenge boards, and shared progress displays fulfil the need for relatedness and extend engagement beyond the solitary tracking paradigm. Beyond well-being, SDT-aligned design carries demonstrable business value: intrinsically motivated users exhibit lower churn, higher session frequency, and greater lifetime value (Japutra, 2022; Stancu et al., 2022). For marketers and brand strategists, the engagement–well-being pathway identified here provides empirical grounding for repositioning fitness applications from utility tools to platforms for holistic psychological empowerment—a narrative that resonates particularly strongly with India's health-conscious younger demographic in a market projected to reach USD 11.14 billion in 2026 (Fortune Business Insights, 2026). Communication strategies emphasising personal growth, community belonging, and emotional flourishing are likely to outperform conventional feature-led messaging in this context. For health practitioners and public health policymakers, the findings affirm that digitally mediated engagement, when designed to satisfy fundamental psychological needs, can serve as a scalable, low-cost vehicle for population-level health promotion. Policymakers advancing India's National Digital Health Mission should consider

Submitted: 27 April 2026, Revised: 09 May 2026, Accepted: 25 May 2026,

integrating need-supportive engagement standards into digital health certification frameworks, leveraging fitness applications as instruments aligned with preventive health objectives.

6. Conclusion

This study examined the relationship between customer engagement (CE) and customer well-being (CWB) among fitness application users in India, employing Self-Determination Theory as the theoretical lens and hierarchical PLS-SEM as the analytical method. The findings confirm that CE modelled as a second-order reflective construct comprising enthusiastic participation, conscious attention, and social connection exerts a strong, positive, and statistically significant effect on CWB ($\beta = 0.685$, $f^2 = 0.883$, $R^2 = 46.9\%$), with all three engagement dimensions contributing meaningfully to the higher-order construct and, through it, to user well-being.

The study advances the field across several interrelated dimensions. Theoretically, it makes three distinct contributions. First, it extends SDT into the mobile fitness application domain, providing empirical verification—in an emerging market context that the three universal psychological needs of autonomy, competence, and relatedness map coherently onto discrete behavioural engagement dimensions and jointly predict user well-being. Second, by operationalising CE as a second-order reflective construct with enthusiastic participation, conscious attention, and social connection as its components, the study adds dimensional precision to the digital engagement literature, where multidimensional formulations remain underutilised in health app contexts (Liu et al., 2025; Joshi et al., 2025; Lim et al., 2022). Third, it contributes to the growing body of work on the post-adoption engagement–well-being nexus (Gupta, 2025; Milne-Ives et al., 2023; Thanthrige & Wickramasinghe, 2026), establishing CE as a proximate psychological determinant of CWB with a large effect size ($f^2 = 0.883$) that surpasses thresholds reported in comparable digital engagement studies.

Methodologically, the study demonstrates the analytical utility of hierarchical PLS-SEM for modelling complex, multidimensional constructs in digital health research. The reflective–reflective second-order specification enabled simultaneous assessment of the three CE sub-dimensions at the lower-order level and their collective structural influence on CWB at the higher-order level a capability unavailable to flat, single-order models. Strong model fit indices (SRMR = 0.077), robust HTMT discriminant validity values (all below 0.85), and bootstrapped path coefficients with 5,000 resamples collectively affirm the approach's rigour and suitability for theory-extending research involving hierarchical constructs (Hair et al., 2022).

Practically, the study provides actionable guidance for three distinct stakeholder groups. For developers and product designers, the dimension loadings offer design priority signals: competence-building features (enthusiastic participation, $\lambda = 0.889$) and autonomy-supportive tools (conscious attention, $\lambda = 0.881$) should receive primary design investment, followed by relatedness-enabling social mechanisms (social connection, $\lambda = 0.802$). SDT-aligned architectures combining these elements will drive not only well-being outcomes but also commercially valuable retention and engagement metrics (Japutra, 2022). For marketers and brand managers, the engagement–well-being relationship provides an empirical foundation for repositioning fitness applications as holistic psychological wellness platforms, a framing that aligns with the aspirations of India's young, digitally engaged consumer segment in a market projected to reach USD 11.14 billion in 2026 (Fortune Business Insights, 2026). For public health policymakers, the study highlights that

Submitted: 27 April 2026, Revised: 09 May 2026, Accepted: 25 May 2026,

digital platforms which support users' psychological and emotional needs can play an important role in improving overall public well-being. Incorporating SDT-based design principles into India's National Digital Health Mission could help create more user-friendly and engaging digital health solutions that positively impact people on a wider scale (Hindman et al., 2026). In sum, this investigation establishes that fitness application engagement is not a neutral or incidental feature of digital health consumption it is a psychologically meaningful process whose design can be intentionally engineered to produce measurable gains in well-being. As digital health markets continue to expand and competition for sustained user attention intensifies, the insight that genuine psychological well-being rather than superficial engagement metrics is both the end goal and the most durable source of user loyalty should guide the next generation of fitness application development in India and beyond.

7. Limitations

The study is not without its limitations. First, its cross-sectional design means that engagement and well-being are measured at a single temporal point, preventing causal conclusions about how these constructs evolve across the app usage lifecycle. Second, although the sample is gender-balanced and drawn from major Indian demographic groups, its predominantly urban composition limits generalisability to rural populations, older users, or users in other national contexts. Third, the investigation does not differentiate between app types (e.g., running, yoga, weight training), which may moderate the engagement–well-being relationship. Future research should address these gaps through longitudinal or experience-sampling methodologies, cross-cultural designs to test boundary conditions of the SDT model in digital health settings, and investigation of moderating variables such as fitness goal orientation, digital health literacy, and specific app design attributes. Incorporating objective behavioural data (e.g., app usage logs) alongside self-reported measures would also strengthen causal inference and provide a richer empirical account of digital engagement in health promotion contexts.

References

Aboelmaged, M., Ali, I., & Hashem, G. (2022). Mobile apps use for wellness and fitness and university students' subjective wellbeing. Information Development, 38(4), 672–687.

Aboelmaged, M., Hashem, G., & Mouakket, S. (2021). Predicting subjective well-being among mHealth users: A readiness–value model. International Journal of Information Management, 56, 102247.

Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50(2), 179–211.

Andrews, F. M., & McKennell, A. C. (1980). Measures of self-reported well-being: Their affective, cognitive, and other components. Social Indicators Research, 8(2), 127–155.

Ariff, M. I. M., Roslan, N. F., Salleh, K. A., & Mohamad, M. (2021). Mobile fitness application for beginners. Indonesian Journal of Electrical Engineering and Computer Science, 24(1), 500–506.

Arora, S., Hofstede, F. T., & Mahajan, V. (2017). The implications of offering free versions for the performance of paid mobile apps. Journal of Marketing, 81(6), 62–78.

Submitted: 27 April 2026, Revised: 09 May 2026, Accepted: 25 May 2026,

Beldad, A. D., & Hegner, S. M. (2018). Expanding the technology acceptance model with the inclusion of trust, social influence, and health valuation. International Journal of Human-Computer Interaction, 34(9), 882–893.

Bhardwaj, P., & Kalro, A. D. (2024). Consumer well-being—A systematic literature review and research agenda using TCCM framework. International Journal of Consumer Studies, 48(1), e12991.

Brodie, R. J., & Hollebeek, L. D. (2011). Advancing and consolidating knowledge about customer engagement. Journal of Service Research, 14(3), 283–284.

Chin, W. W. (1998). The partial least squares approach to structural equation modeling. In G. A. Marcoulides (Ed.), Modern methods for business research (pp. 295–336). Lawrence Erlbaum Associates.

Chin, W. W., & Todd, P. A. (1995). On the use, usefulness, and ease of use of structural equation modeling in MIS research: A note of caution. MIS Quarterly, 19(2), 237–246.

Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Lawrence Erlbaum Associates.

Crisp, R. (2021). Well-being. In E. N. Zalta (Ed.), The Stanford encyclopedia of philosophy (Winter 2021). Metaphysics Research Lab, Stanford University.

Sensor Tower. (2026). State of mobile 2026. https://sensortower.com/blog/state-of-mobile-2026

David, M. E., Roberts, J. A., & Christenson, B. (2018). Too much of a good thing: Investigating the association between actual smartphone use and individual well-being. International Journal of Human–Computer Interaction, 34(3), 265–275.

Deci, E. L., & Ryan, R. M. (1985). Intrinsic motivation and self-determination in human behavior. Springer.

Diener, E., & Sim, J. H. (2024). Happiness/subjective well-being. In Emotion theory: The Routledge comprehensive guide (pp. 199–217). Routledge.

Falter, M., & Hadwich, K. (2020). Customer service well-being: Scale development and validation. The Service Industries Journal, 40(1–2), 181–202.

Fitness Apps Market Report. (2025). Fitness apps market report – Trends & forecast 2025 to 2035. https://www.futuremarketinsights.com/reports/fitness-apps-market

Fortune Business Insights. (2026). Digital health market size, share & industry analysis. https://www.fortunebusinessinsights.com/industry-reports/digital-health-market-100227

Gilal, F. G., Zhang, J., Paul, J., & Gilal, N. G. (2019). The role of self-determination theory in marketing science: An integrative review and agenda for research. European Management Journal, 37(1), 29–44.

Grand View Research. (2025). Smartphone applications market size, share & trends analysis report. https://www.grandviewresearch.com/industry-analysis/smartphone-applications-market

Gupta, S. (2025). Consumer wellbeing through fitness apps: A psychological ownership perspective. Global Knowledge, Memory and Communication. https://doi.org/10.1108/GKMC-05-2024-0265

Guo, J., Shan, S., & Ali Khan, Y. (2023). What are the impetuses behind e-health applications' self-management services' ongoing adoption? Health Informatics Journal, 29(1), 14604582231152801.

Submitted: 27 April 2026, Revised: 09 May 2026, Accepted: 25 May 2026,

Harrigan, P., Evers, U., Miles, M. P., & Daly, T. (2018). Customer engagement and the relationship between involvement, engagement, self-brand connection and brand usage intent. Journal of Business Research, 88, 388–396.

Hashmi, H. B. A., Shu, C., Haider, S. W., Khalid, A., & Munir, Y. (2021). Bridging the gap between product design and customer engagement: Role of self-determined needs satisfaction. Sage Open, 11(4).

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report results of PLS-SEM. European Business Review, 31(1), 2–24.

Hair, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2022). Advanced issues in partial least squares structural equation modeling (2nd ed.). Sage.

Henkens, B., Verleye, K., & Larivière, B. (2021). The smarter, the better?! Customer well-being, engagement, and perceptions in smart service systems. International Journal of Research in Marketing, 38(2), 425–447.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academy of Marketing Science, 43(1), 115–135.

Hindman, J., Zugai, J., Foster, K., & Raeburn, T. (2026). Self-determination theory as a framework for research and design of digital applications for nurses' well-being. Journal of Advanced Nursing, 82(1), 897–906. https://doi.org/10.1111/jan.16895

Ho, M. H. W., & Chung, H. F. (2020). Customer engagement, customer equity and repurchase intention in mobile apps. Journal of Business Research, 121, 13–21.

Hollebeek, L. D., & Belk, R. (2021). Consumers' technology-facilitated brand engagement and wellbeing. International Journal of Research in Marketing, 38(2), 387–401.

Hollebeek, L. D., Glynn, M. S., & Brodie, R. J. (2014). Consumer brand engagement in social media: Conceptualization, scale development and validation. Journal of Interactive Marketing, 28(2), 149–165.

Hollebeek, L. D., & Macky, K. (2019). Digital content marketing's role in fostering consumer engagement, trust, and value. Journal of Interactive Marketing, 45(1), 27–41.

Hollebeek, L. D., Sharma, T. G., Pandey, R., Sanyal, P., & Clark, M. K. (2022). Fifteen years of customer engagement research: A bibliometric and network analysis. Journal of Product & Brand Management, 31(2), 293–309.

Harwood, S., & Anglim, J. (2019). Problematic smartphone usage and subjective and psychological well-being. Computers in Human Behavior, 97, 44–50.

Hsiao, C. H., Chang, J. J., & Tang, K. Y. (2016). Exploring the influential factors in continuance usage of mobile social apps. Telematics and Informatics, 33(2), 342–355.

Hu, J., He, W., Zhang, J., & Song, J. (2023). Examining the impacts of fitness app features on user well-being. Information & Management, 60(5), 103796.

Submitted: 27 April 2026, Revised: 09 May 2026, Accepted: 25 May 2026,

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling: A Multidisciplinary Journal, 6(1), 1–55.

Huang, M. H., & Rust, R. (2021). Engaged to a robot? The role of AI in service. Journal of Service Research, 24(1), 30–41.

Japutra, A., Higueras-Castillo, E., & Liebana-Cabanillas, F. (2022). Building customer engagement in mobile commerce through need fulfillment: An approach of self-determination theory. Journal of Strategic Marketing, 32(1), 80–99.

Jeno, L. M., Adachi, P. J., Grytnes, J. A., Vandvik, V., & Deci, E. L. (2019). The effects of m-learning on motivation, achievement and well-being: A self-determination theory approach. British Journal of Educational Technology, 50(2), 669–683.

Joshi, S. P., Dahal, R. K., Sharma, D. R., Karki, D., & Ghimire, B. (2025). Impact of fitness app experiences on users' overall well-being through joy, usefulness and social connectivity. Journal of Logistics, Informatics and Service Science, 12(4), 235–258.

Kemppainen, T., & Paananen, T. E. (2024). Dualities of digital services: Everyday digital services as positive and negative contributors to customer well-being. Journal of Service Theory and Practice, 34(3), 464–490.

Keyes, C. L. M., Shmotkin, D., & Ryff, C. D. (2002). Optimizing well-being: The empirical encounter of two traditions. Journal of Personality and Social Psychology, 82(6), 1007–1022.

Kim, Y. H., Kim, D. J., & Wachter, K. (2013). A study of mobile user engagement (MoEN): Engagement motivations, perceived value, satisfaction, and continued engagement intention. Decision Support Systems, 56, 361–370.

Kshirsagar, K. P., & Ingle, A. (2025). Impacts of digital technologies across generations. In Bridging academia and industry through cloud integration in education (pp. 1–36). IGI Global Scientific Publishing.

Kumar, V., Ramachandran, D., & Kumar, B. (2021). Influence of new-age technologies on marketing: A research agenda. Journal of Business Research, 125, 864–877.

Lee, B., Kwon, O., Lee, I., & Kim, J. (2017). Companionship with smart home devices: The impact of social connectedness and interaction types on perceived social support. Computers in Human Behavior, 75, 922–934.

Lee, H. K., Kim, W. B., & Choo, H. J. (2025). Consumers' engagement in online shopping platforms: Influences on self-concept and subjective well-being. Asia Pacific Journal of Marketing and Logistics. https://doi.org/10.1108/APJML-10-2024-1411

Li, M., Wang, S., & Darweesh, A. R. A. S. (2025). The influence of fitness mobile apps on workout behavior intention among Chinese young adults. PLOS ONE, 20(3), e0320049.

Lim, W. M., Rasul, T., Kumar, S., & Ala, M. (2022). Past, present, and future of customer engagement. Journal of Business Research, 140, 439–458.

Submitted: 27 April 2026, Revised: 09 May 2026, Accepted: 25 May 2026,

Lin, K. Y., & Huang, T. K. (2024). Shopping in the digital world: How augmented reality mobile applications trigger customer engagement. Technology in Society, 77, 102540.

Liu, Y., & Avello, M. (2021). Status of the research in fitness apps: A bibliometric analysis. Telematics and Informatics, 57, 101506.

Liu, Y., Zhang, Y., & Fang, Z. (2025). Leveraging mobile fitness apps for healthier lifestyles: How affordances drive sustained engagement. Digital Health, 11. https://doi.org/10.1177/20552076251389058

Martela, F. (2020). Self-determination theory. In The Wiley encyclopedia of personality and individual differences: Models and theories (pp. 369–373).

Milne-Ives, M., Homer, S. R., Andrade, J., & Meinert, E. (2023). Potential associations between behavior change techniques and engagement with mobile health apps: A systematic review. Frontiers in Psychology, 14, 1227443.

O'Brien, R. M. (2007). A caution regarding rules of thumb for variance inflation factors. Quality & Quantity, 41(5), 673–690.

Peters, D., Calvo, R. A., & Ryan, R. M. (2018). Designing for motivation, engagement and wellbeing in digital experience. Frontiers in Psychology, 9, 300159.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. Journal of Applied Psychology, 88(5), 879–903.

Rather, R. A., & Sharma, J. (2017). Customer engagement for evaluating customer relationships in hotel industry. European Journal of Tourism Hospitality and Recreation, 8(1), 1–13.

Reeve, J. (2012). A self-determination theory perspective on student engagement. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), Handbook of research on student engagement (pp. 149–172). Springer.

Roy, S. K., Singh, G., Sadeque, S., Harrigan, P., & Coussement, K. (2023). Customer engagement with digitalized interactive platforms in retailing. Journal of Business Research, 164, 114001.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. American Psychologist, 55(1), 68–78.

Ryan, R. M., & Deci, E. L. (2017). Self-determination theory: Basic psychological needs in motivation, development, and wellness. Guilford Press.

Ryan, R. M., & Deci, E. L. (2019). Brick by brick: The origins, development, and future of self-determination theory. Advances in Motivation Science, 6, 111–156.

Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. Contemporary Educational Psychology, 61, 101860.

Ryan, R. M., & Vansteenkiste, M. (2023). Self-determination theory. In The Oxford handbook of self-determination theory (pp. 3–30). Oxford University Press.

Sarstedt, M., Ringle, C. M., & Hair, J. F. (2017). Partial least squares structural equation modeling. In C. Homburg, M. Klarmann, & A. Vomberg (Eds.), Handbook of market research. Springer.

Submitted: 27 April 2026, Revised: 09 May 2026, Accepted: 25 May 2026,

Sheen, F., et al. (2025). Living well? The unintended consequences of highly popular commercial fitness apps through social listening using Machine-Assisted Topic Analysis: Evidence from X. British Journal of Health Psychology, 30, e70026. https://doi.org/10.1111/bjhp.70026

Shen, X. L., Li, Y. J., Sun, Y., Chen, Z., & Wang, F. (2019). Understanding the role of technology attractiveness in promoting social commerce engagement. Information & Management, 56(2), 294–305.

Soltani Nejad, N., Rastegar, R., & Jahanshahi, M. (2022). Tourist engagement with mobile apps of e-leisure: A combined model of self-determination theory and technology acceptance model. Tourism Recreation Research.

Southcott, E., & Jooste, J. (2024). Unveiling the impact of mobile fitness applications on motivational orientation in sustaining exercise behaviors: A qualitative investigation. Physical Culture and Sport, 103(1), 1–14.

Srivastava, R., Gupta, P., Kumar, H., & Tuli, N. (2025). Digital customer engagement: A systematic literature review and research agenda. Australian Journal of Management, 50(1), 220–245.

Stancu, V., Frank, D. A., Lähteenmäki, L., & Grunert, K. G. (2022). Motivating consumers for health and fitness: The role of app features. Journal of Consumer Behaviour, 21(6), 1506–1521.

Statista. (2024). Fitness apps – India. https://www.statista.com/outlook/hmo/digital-health/digital-fitness-well-being/health-wellness-coaching/fitness-apps/india

Statista. (2025). Mobile app revenue worldwide 2025 – Digital market outlook. https://www.statista.com/outlook/dmo/app/worldwide

Sensor Tower. (2026). State of mobile 2026. https://sensortower.com/blog/state-of-mobile-2026

Thanthrige, A., & Wickramasinghe, N. (2026). Digital health solutions for type 2 diabetes and prediabetes: Systematic review of engagement barriers, facilitators, and outcomes. JMIR Diabetes, 11, e80582. https://doi.org/10.2196/80582

Tov, W. (2018). Well-being concepts and components. In Handbook of subjective well-being (pp. 1–15). Noba Scholar.

Uysal, M., Sirgy, M. J., Woo, E., & Kim, H. (2016). Quality of life (QOL) and well-being research in tourism. Tourism Management, 53, 244–261.

Van Doorn, J., Lemon, K. N., Mittal, V., Nass, S., Pick, D., Pirner, P., & Verhoef, P. C. (2010). Customer engagement behavior: Theoretical foundations and research directions. Journal of Service Research, 13(3), 253–266.

Villalobos-Zúñiga, G., & Cherubini, M. (2020). Apps that motivate: A taxonomy of app features based on self-determination theory. International Journal of Human-Computer Studies, 140, 102449.

Viswanathan, V., Malthouse, E. C., Maslowska, E., Hoornaert, S., & Van den Poel, D. (2018). Dynamics between social media engagement, firm-generated content, and live and time-shifted TV viewing. Journal of Service Management, 29(3), 378–398.

Vivek, S. D., Beatty, S. E., & Morgan, R. M. (2012). Customer engagement: Exploring customer relationships beyond purchase. Journal of Marketing Theory and Practice, 20(2), 127–149.

Submitted: 27 April 2026, Revised: 09 May 2026, Accepted: 25 May 2026,

Vivek, S. D., Beatty, S. E., Dalela, V., & Morgan, R. M. (2014). A generalized multidimensional scale for measuring customer engagement. Journal of Marketing Theory and Practice, 22(4), 401–420.

Wong, K. K. K. (2015). Partial least squares structural equation modeling (PLS-SEM) techniques using SmartPLS. Marketing Bulletin, 24(1), 1–32.

Yang, Y., et al. (2024). Customer engagement behaviors in brand communities. Journal of Theoretical and Applied Electronic Commerce Research, 19(4), 3520–3546.

Zhao, C., & Wei, H. (2019). The highest hierarchy of consumption: A literature review of consumer well-being. Open Journal of Social Sciences, 7(4), 135–149.

Submitted: 27 April 2026, Revised: 09 May 2026, Accepted: 25 May 2026,