Towards Well-Being Patients Through Value Cocreation In Healthcare: A Self-Determination Theory Perspective In Telemedicine

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Abstract

Telemedicine has emerged as a transformative approach in healthcare delivery, particularly in addressing accessibility and efficiency challenges in traditional systems. While prior research has emphasized its technological and operational benefits, studies investigating the intrinsic drivers of patient engagement, especially from a value cocreation perspective remain scant. Grounded in self-determination theory (SDT) and service-dominant logic (SDL), this study investigates how intrinsic motivation, external regulation, and identified regulation influence value cocreation behavior and, subsequently, patient-perceived value and well-being. Data were collected through an electronic survey targeting telemedicine users in Greater Jakarta who had used digital health services within the past six months. Partial least squares structural equation modeling (PLS-SEM) was employed to analyze the data and assess both the measurement and structural models. Results confirm that all hypothesized relationships are significant. Identified regulation demonstrates the strongest influence on value cocreation behavior, followed by intrinsic motivation and external regulation. Furthermore, value cocreation behavior significantly enhances both perceived value and well-being, with perceived value also positively affecting well-being. The model exhibits strong explanatory power and predictive relevance. This study contributes by highlighting the importance of motivational quality in shaping patient engagement and outcomes thus provides actionable insights for healthcare providers aiming to design telemedicine platforms that foster meaningful interaction, improve patient satisfaction, and enhance overall health-related well-being.

Key word: Telemedicine, patient value cocreation, patient well-being, intrinsic motivation, external regulation, identified regulation

Introduction

Telemedicine, or remote healthcare consultation services, has experienced rapid development in recent years. As a core application of digital health, telemedicine utilizes audio, visual, and data communication technologies to facilitate medical diagnosis and consultation without the need for in-person interaction. This approach enhances both accessibility and efficiency in healthcare delivery, enabling patients to receive medical support from any location. Furthermore, innovations in telemedicine have improved communication between patients and physicians, fostering a more collaborative healthcare environment (Haleem et al., 2021).

In Indonesia, the healthcare sector has undergone a significant transformation due to the swift growth and adoption of telemedicine. This shift has been notably accelerated by factors such as the COVID-19 pandemic and the urgent need to overcome geographical barriers in accessing medical services (Alexandra et al., 2021). Such developments signify a transition toward a new paradigm in healthcare service delivery. Data indicate a dramatic increase in public interest in telemedicine during the pandemic, with platforms such as Halodoc, Alodokter, and YesDok gaining widespread popularity among Indonesian users. A study further suggests that users have utilized telemedicine services, primarily due to the advantages of time and cost efficiency (Alfian et al., 2024).

Telemedicine offers a range of benefits that address key challenges inherent in traditional healthcare delivery systems. One of its most significant advantages is the enhancement of healthcare accessibility, particularly for individuals residing in remote or underserved areas, as well as those with limited physical mobility (Valencia-Arias et al., 2024). By eliminating the need for face-to-face consultations, telemedicine provides greater convenience, allowing patients to connect with healthcare professionals without enduring long commutes—often a major barrier to timely care. Additionally, it presents considerable potential for cost savings, both for patients and healthcare providers (Snoswell et al., 2020), by reducing expenses related to travel, infrastructure, and hospital visits. Another critical benefit is the ability to facilitate continuous health monitoring (Eletti et al., 2025), which is especially valuable in managing chronic diseases.

The core functionalities of telemedicine encompass a variety of services designed to support remote clinical interactions (Sikander et al., 2023). These include virtual medical consultations via audio or video calls, remote patient monitoring—which is particularly beneficial for individuals with long-term health conditions—secure and rapid transmission of medical data such as laboratory results and electronic health records, and the provision of patient-centered health education to promote better understanding and self-management of health issues (Ezeamii et al., 2024).

Although data from BPS (2022) indicate that only 5% of the population had used telemedicine services at that time, the growing adoption of telemedicine in Indonesia signifies not merely a shift toward digital healthcare tools, but rather a profound transformation in the structure and delivery of health services (Salsabila & Dachyar, 2024). This transition reflects a broader paradigm shift in how patients interact with healthcare systems—moving from a provider-centric model to one that increasingly emphasizes patient agency and digital engagement. As more patients access medical consultations and health information through virtual platforms, the traditional dynamics between patients and healthcare providers are being redefined, leading to new patterns of interaction, expectation, and service experience (Sun & Buijsen, 2024).

Consequently, understanding patient experiences in telemedicine must go beyond technical aspects such as internet connectivity or platform usability (Snoswell et al., 2020). It requires deeper exploration of behavioral and relational dimensions, particularly patients' intrinsic motivations for adopting this mode of care. Patient engagement becomes a critical factor influencing the success and sustainability of telemedicine initiatives (Wu et al., 2024). According to service-dominant logic (SDL), value in healthcare is not simply delivered by providers, but co-created through active interactions between patients and healthcare professionals (Nariswari & Vargo, 2024). Therefore, the extent to which patients perceive themselves as active participants in their healthcare journey significantly affects the perceived quality and effectiveness of telemedicine services.

Despite the growing body of literature on telemedicine adoption and its structural implications in healthcare delivery, there remains a notable lack of comprehensive understanding regarding the behavioral mechanisms that drive patient engagement in digital health environments. While existing studies have extensively examined the technological, operational, and accessibility benefits of telemedicine (e.g., Valencia-Arias et al., 2024; Snoswell et al., 2020), relatively limited attention has been given to the motivational drivers underlying patient participation—particularly from the lens of self-determination theory. This is significant because value in healthcare is not unilaterally produced by providers but co-created through active patient involvement. However, current research often treats patients as passive users rather than autonomous agents whose motivations shape their engagement and, consequently, the effectiveness of telemedicine services. Therefore, this study seeks to bridge these gaps by integrating SDT with service-dominant logic (SDL) to offer a more nuanced understanding of how patient motivation shapes co-creative behaviors and contributes to holistic healthcare outcomes in digitally mediated environments.

The purpose of this study is twofold. First, this study aims to address gap in the current understanding of patient engagement in telemedicine by examining how intrinsic motivations influence patients' participation in value cocreation processes. Specifically, it seeks to uncover how these motivational drivers shape the extent and quality of patient involvement during virtual healthcare interactions, and how such engagement contributes to both perceived service value and patient well-being. Second, this study advances the application of service-dominant logic (S-D Logic) in healthcare by integrating insights from Self-Determination Theory (SDT) to better explain the behavioral mechanisms underlying co-creative dynamics in digital health contexts. It emphasizes that value cocreation is not only beneficial for patients—who gain greater agency and satisfaction—but also for healthcare providers, who can achieve improved treatment adherence, more efficient care delivery, and stronger patient-provider relationships.

Self-Determination Theory. According to self-determination theory (SDT), intrinsic motivation is characterized by engagement in an activity for the inherent satisfaction or enjoyment it provides (Ryan & Deci, 2020). In contrast, extrinsic motivation arises when individuals perform actions to attain separable outcomes, such as external rewards or social recognition (Urhahne & Wijnia, 2023). Within the SDT framework, extrinsic motivation is further categorized into different types based on the degree of behavioral internalization.

At the lowest level of internalization lies external regulation, where behavior is driven primarily by the desire to obtain rewards or avoid punishment (Bandhu et al., 2024). On the other hand, identified regulation represents a more internalized form of extrinsic motivation, wherein individuals engage in a behavior because they personally value its outcomes or consider it personally relevant (Knittle et al., 2023). For instance, patients exhibiting high levels of identified regulation may participate in online consultations not due to external pressure, but because they perceive these interactions as essential to achieving their personal health goals.

SDT posits that as the level of autonomy increases—whether through intrinsic motivation or more internalized forms of extrinsic motivation such as identified regulation—individuals demonstrate greater engagement, persistence, and commitment to health-related behaviors (Cosme & Berkman, 2020). This theoretical perspective underscores the importance of fostering autonomous motivation in healthcare,

particularly in digital environments such as telemedicine, where active patient involvement is crucial for effective service cocreation and positive health outcomes.

According to SDT, intrinsic motivation arises when individuals engage in activities because they find them inherently interesting or personally meaningful (Ryan & Deci, 2020). In healthcare, this translates into patients participating in their care not merely out of obligation or external pressure, but because they derive personal satisfaction, interest, or a sense of control from the process (Krist et al., 2017). Intrinsic motivation is considered the most autonomous form of motivation, and it has been consistently linked with greater behavioral persistence, deeper engagement, and more effective learning (Ryan & Deci, 2020).

In telemedicine, where physical presence and traditional cues are limited, intrinsic motivation becomes a critical driver of active patient involvement. When patients are intrinsically motivated, they are more likely to ask clarifying questions (Deci & Ryan, 2012), share relevant health information (Mao et al., 2021), follow medical advice, and engage in collaborative decision-making (Khomkham & Kaewmanee, 2024)—all of which are key indicators of value cocreation behavior.

From the perspective of SDL, value in healthcare is not created unilaterally by providers but is co-created through the interaction and contributions of multiple actors, especially patients (Y. Peng et al., 2022). In this framework, patients are viewed as active participants who bring their own resources—such as knowledge, effort, and emotional engagement—to the service process. Intrinsic motivation enhances the likelihood that patients will contribute these resources voluntarily and meaningfully, thereby facilitating the cocreation of value (Ezeamii et al., 2024; Pham et al., 2022).

Empirical studies in digital service environments support this link between intrinsic motivation and co-creative behaviors. For instance, in customer service platforms, users with high levels of intrinsic motivation demonstrate greater participation, problem-solving initiative, and constructive feedback (Nohutlu et al., 2023). These findings suggest that similar mechanisms may operate in telemedicine, where patient engagement is essential for achieving desired health outcomes.

Therefore, based on SDT's emphasis on autonomy and internal drive, and SDL's view of value as a jointly constructed phenomenon, the study posits that:

H1. There is a positive relationship between patient's intrinsic motivation and value cocreation behavior.

While intrinsic motivation represents the most autonomous form of behavioral engagement, SDT also recognizes various forms of extrinsic motivation, with *external regulation* as the least autonomous (Ryan & Deci, 2020). External regulation refers to actions performed primarily to obtain rewards or avoid punishments imposed by external sources (Ryan & Deci, 2020). In healthcare, this may include behaviors driven by directives from physicians, pressure from family members, or incentives such as insurance coverage or financial subsidies.

Although external regulation reflects low levels of internalization and autonomy, it can still serve as a catalyst for patient participation in service processes, particularly when individuals are at early stages of health behavior change (Patrick & Williams, 2012; Sagen et al., 2023). For instance, a patient may attend a telemedicine consultation not out of personal interest or perceived relevance, but because it is mandated by an employer's health program or linked to a tangible benefit such as medication

reimbursement. Despite its externally driven nature, such behavior can lead to active involvement in the care process, including information sharing, compliance with medical advice, and follow-up engagement—all of which contribute to value cocreation.

From an SDL perspective, even behaviors initiated through external contingencies can facilitate value cocreation if they result in meaningful interaction between patients and healthcare providers (Hau & Thuy, 2022). S-D Logic emphasizes that value emerges from the use of resources—whether physical, cognitive, or emotional—during service encounters. Thus, even when a patient engages in a teleconsultation due to external incentives, their active participation can enhance the quality of diagnosis, treatment adherence, and overall care experience (El-Tallawy et al., 2024; Olowoyo et al., 2025).

Empirical evidence in digital service environments supports this view. Studies on e-health platforms have found that patients motivated by external factors—such as convenience, cost savings, or mandatory health monitoring—are more likely to engage in basic co-creative activities (Madanian et al., 2023; D. Wu et al., 2021), such as completing online questionnaires, submitting lab results, or attending scheduled virtual appointments.

Therefore, despite its relatively low autonomy compared to intrinsic motivation, external regulation can still positively influence value cocreation behavior. The study posits that:

H2. There is a positive relationship between patient's external regulation and value cocreation behavior.

Identified regulation represents a more internalized form of extrinsic motivation in which individuals engage in a behavior because they personally endorse its importance or relevance(Ryan & Deci, 2020). Unlike external regulation—which is driven by external contingencies such as rewards or punishment—identified regulation reflects a higher degree of autonomy, as the individual acknowledges the personal significance of the activity and chooses to participate accordingly (Grenier et al., 2024; Vandenabeele & Breaugh, 2024).

In healthcare, patients exhibiting high levels of identified regulation are likely to engage in health-related behaviors because they believe these actions contribute meaningfully to their well-being. For example, a patient may choose to actively participate in a telemedicine consultation not because of external pressure, but because they recognize the potential benefits of early diagnosis, preventive care, or effective treatment planning (Moulaei et al., 2023; Su et al., 2024).

Such purposeful engagement is essential for the cocreation of value. S-D Logic posits that value emerges through the application of resources—such as knowledge, time, and effort—during service interactions. Identified regulation increases the likelihood that patients will contribute these personal resources voluntarily and effectively, thereby enhancing the quality of interaction and the outcomes of care (Beirão et al., 2017).

Research has shown that patients who perceive online health services as personally meaningful are more likely to share detailed medical histories, ask clarifying questions, follow clinical advice, and return for follow-up consultations (Hickmann et al., 2022) —all of which constitute key dimensions of value cocreation behavior.

Compared to external regulation, identified regulation is associated with greater behavioral persistence and deeper engagement, making it a stronger predictor of

sustained participation in healthcare processes. Therefore, building on SDT's continuum of motivational types and SDL's emphasis on collaborative value creation, this study posits that:

H3. There is a positive relationship between patient identified regulation and value cocreation behavior

Service-Dominant Logic and Value Cocreation. Service-Dominant Logic (S-D Logic) conceptualizes value creation as a collaborative process that emerges through the interaction of multiple actors. A foundational principle of S-D Logic asserts that individuals leverage their capabilities to benefit others, while simultaneously benefiting from the competencies of those with whom they engage in service exchange (Nariswari & Vargo, 2024). Within the healthcare domain, this perspective positions both patients and healthcare professionals as key co-actors who jointly construct service value through their mutual interactions (Fusco et al., 2023).

Value cocreation behavior refers to the active contributions made by patients during the healthcare delivery process, which aim to enhance the quality of outcomes for all involved parties (Y. Peng et al., 2022). Such behaviors may include asking clarifying questions, providing comprehensive information regarding symptoms and medical history, or adhering to prescribed treatment recommendations. These actions not only support more accurate diagnosis and effective care planning but also reinforce the relational and experiential dimensions of healthcare service delivery (Mao et al., 2021).

By embracing the principles of SDL, healthcare systems can shift from a transactional model to a more participatory and relational approach, where patients are recognized as active agents whose involvement is essential to achieving optimal health outcomes (Shirazi et al., 2021). This paradigm is particularly relevant in telemedicine where the cocreation of value relies heavily on intentional and meaningful patient engagement.

In healthcare service encounters, patient-perceived value refers to the overall assessment of the benefits received relative to the sacrifices made during the care process (Liu et al., 2023). It encompasses not only clinical outcomes but also experiential and emotional dimensions such as trust, satisfaction, and sense of empowerment. According to SDL, perceived value is not unilaterally determined by providers but emerges through the active participation of patients in the service process (Samsa & Yüce, 2022).

Value cocreation behavior plays a central role in shaping this perception. When patients engage in behaviors such as sharing relevant health information, asking clarifying questions, or adhering to treatment recommendations, they enhance the quality of care delivery and their own service experience (Hau & Thuy, 2022). This participatory dynamic increases the likelihood that patients will perceive greater alignment between their expectations and the outcomes they receive, thereby strengthening their overall evaluation of the service's worth (Krist et al., 2017).

Empirical evidence from digital service environments supports this link. Studies in e-health have found that higher levels of patient involvement correlate with increased satisfaction and perceived usefulness of online consultations (Çakmak & Uğurluoğlu, 2024; Wang & Zhang, 2024). In telemedicine, where personal interaction is mediated through technology, meaningful engagement becomes even more critical in shaping favorable value perceptions.

Thus, the following hypothesis is proposed:

H4. There is a positive relationship between value cocreation behavior and patient-perceived value.

Well-being in healthcare extends beyond the absence of illness to include physical, emotional, and social dimensions of health-related quality of life (Ruggeri et al., 2020). SDT emphasizes that individuals experience enhanced well-being when their fundamental psychological needs are satisfied (Ryan & Deci, 2020). Value cocreation behavior provides a mechanism through which these needs can be fulfilled, particularly in virtual care environments.

When patients actively participate in their care they gain a greater sense of control over their health, improved understanding of their condition, and stronger connection with healthcare providers. These experiences contribute directly to an enhanced sense of well-being and overall life satisfaction (Šakan et al., 2020).

Moreover, SDL asserts that value-in-use is ultimately tied to individual well-being (Cui & Aulton, 2023). Thus, the extent to which patients engage in co-creative behaviors during telemedicine consultations influences not only the effectiveness of care but also the emotional and psychological benefits derived from the interaction.

Empirical studies in health services research corroborate this view. For instance, research has shown that patients who feel heard and involved in decision-making report better recovery outcomes, lower stress levels, and higher satisfaction with their care experience (Galletta et al., 2022; Krist et al., 2017).

Therefore, the following hypothesis is proposed:

H5: There is a positive relationship between value cocreation behavior and patient well-being.

Patients Value and Patients Well-being. One of the key impacts of value cocreation in healthcare services is the enhancement of patient well-being and their overall perception of service value. Health outcomes are regarded as the primary form of value generated through healthcare interactions. Effective cocreation processes can be observed through improvements in these health outcomes; for instance, patients may report increased energy levels, improved symptom management, or a general sense of better health following a teleconsultation.

Beyond clinical benefits, cocreation also significantly influences service-related outcomes (Fusco et al., 2023). Empirical studies have demonstrated that active patient participation is positively associated with perceived service quality (Paukkonen et al., 2021), satisfaction (Zhang et al., 2025), and overall value assessment (Westerink et al., 2024). Patient-perceived value captures the balance between the benefits received and the sacrifices made throughout the healthcare experience. This value may manifest in terms of ease of access to medical information, the quality of communication with providers, and overall satisfaction with the care process in telemedicine.

In healthcare literature, patient-perceived value is increasingly recognized as a multidimensional construct that encompasses the overall appraisal of benefits received relative to the efforts or sacrifices made during the care process (Liu et al., 2023, 2024).

Well-being in healthcare extends beyond the absence of disease to encompass physical, mental, and social dimensions of health-related quality of life (Ruggeri et al., 2020). A growing body of evidence suggests that when patients perceive their healthcare experiences as valuable they report higher psychological well-being (Keelson et al., 2024).

The connection between perceived value and well-being can be explained through both cognitive and affective pathways. Cognitively, when patients believe that the care they receive aligns with their expectations and needs, it reinforces a sense of efficacy and control over their health (Arboleda, 2023), contributing positively to their self-efficacy and mental state. Affectively, positive evaluations of care delivery enhance emotional satisfaction, reduce anxiety, and foster trust in the healthcare system (Bradshaw et al., 2022).

Therefore, the following hypothesis is proposed:

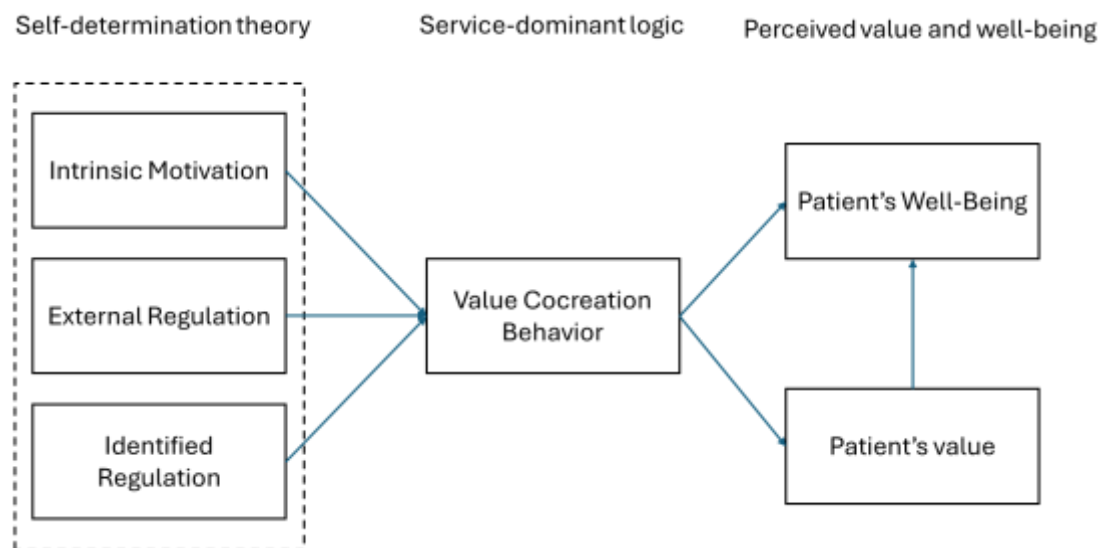*H6: There is a positive relationship between patient-perceived value and patient well-being.*

Figure 1. Proposed conceptual model

Research Methods

This study employed a quantitative survey-based approach to examine the relationships between patients' intrinsic motivation, value cocreation behavior, perceived value, and well-being. Data were collected through an electronic questionnaire distributed to individuals residing in the Greater Jakarta area who had utilized telemedicine services within the past six months. This geographic and demographic focus was selected due to the area's status as a leading hub for digital health innovation in Indonesia, with high rates of telemedicine adoption and digital literacy. This study collected 256 valid samples.

The survey instrument was developed based on established scales drawn from validated instruments in the fields of psychology, marketing, and healthcare service research. Specifically, measurement items for intrinsic and extrinsic motivation (including external and identified regulation) were adapted from SDT-based studies (Osei-Frimpong et al., 2015; Ryan & Deci, 2020). Value cocreation behavior was measured using constructs derived from service-dominant logic literature (Peng et al., 2025), while patient-perceived value and well-being were assessed using scales validated in health services and patient experience research (Keelson et al., 2024; Liu et al., 2023). All items were contextualized to fit the telemedicine setting and pilot-tested for clarity and relevance prior to full-scale data collection.

Table 1. Measurement items

Construct	Item	References
Intrinsic motivation	1. I use telemedicine services because I enjoy being actively involved in my health care. 2. I find it personally satisfying to manage my health through online consultations. 3. I consult with doctors online because I feel a sense of interest in understanding my own health. 4. Using telemedicine makes me feel competent and in control of my health decisions	Osei-Frimpong (2017); Ryan & Deci (2020)
External regulation	1. I use telemedicine services mainly because they are required by my insurance provider. 2. I participate in online consultations because someone else (e.g., doctor, family) told me to. 3. I choose telemedicine because it is cheaper or comes with financial incentives. 4. I use online health services to avoid missing work or other commitments.	Osei-Frimpong (2017); Ryan & Deci (2020)
Identified regulation	1. I believe that using telemedicine is important for maintaining my health. 2. I value the convenience of online consultations and how they support my health needs. 3. I think that using telemedicine services helps me achieve better health outcomes. 4. I consider online consultations to be an essential part of managing my health effectively	Osei-Frimpong (2017); Ryan & Deci (2020)
Value cocreation behavior	1. I provide detailed information about my symptoms and medical history during online consultations. 2. I ask questions to clarify the doctor's advice or diagnosis during telemedicine sessions. 3. I follow the recommendations provided by the healthcare provider after an online consultation. 4. I share relevant personal health data (e.g., lab results, medication records) with the doctor via telemedicine platforms.	Peng et al. (2025)

	5. I feel responsible for contributing to the success of my virtual healthcare consultation.	
	6. I engage in discussions with the healthcare provider to make joint decisions about my treatment plan.	
Patient's perceived value	1. I believe that the benefits I receive from using telemedicine are worth the time and effort I put in.	Liu et al. (2023)
	2. The services I receive through telemedicine are valuable to me.	
	3. Using telemedicine has met my expectations regarding healthcare quality.	
	4. I feel that the cost (financial or time) of using telemedicine is justified by the benefits I receive.	
	5. Overall, I am satisfied with the value I get from telemedicine services.	
	6. Telemedicine provides me with convenient access to healthcare that I find personally worthwhile.	
Patient well-being	1. After using telemedicine, I feel more confident about managing my health.	Keelson et al. (2024)
	2. My experience with online consultations has improved my sense of well-being.	
	3. I feel reassured and less anxious about my health after consulting with a doctor online.	
	4. Using telemedicine has helped me feel more in control of my health condition.	
	5. I feel physically better supported since I started using telemedicine services.	
	6. Online consultations have positively contributed to my overall satisfaction with my healthcare experience.	

Data analysis was conducted using partial least squares structural equation modeling (PLS-SEM), a variance-based multivariate statistical technique particularly suited for theory-testing in behavioral and social science research (Hair et al., 2021b). PLS-SEM allows for the simultaneous estimation of both the measurement model (assessing the reliability and validity of the constructs) and the structural model (testing the hypothesized relationships among latent variables). This method is especially appropriate for studies aiming to validate nomological networks and explore complex relationships among multiple constructs, as in the present research (Hair et al., 2021a). The use of PLS-SEM also aligns with the study's objective of developing empirical support for a conceptual model integrating SDT and SDL in telemedicine use.

Results and Discussion

Respondent Profile. As presented in Table 2, the sample consisted of 256 respondents,with a nearly balanced gender distribution: 51.6% ($n = 132$) female and 48.4% ($n = 124$) male. The majority of participants were aged between 18 and 34 years (64.5%, $n = 165$), with 30.9% ($n = 79$) aged 18–24 and 33.6% ($n = 86$) aged 25–34. Most respondents held at least an undergraduate degree (67.6%, $n = 173$), while 18.4% ($n = 47$) had a diploma and 14.1% ($n = 36$) had completed high school or lower. The largest occupational group was private sector employees (30.5%, $n = 78$), followed by students (21.1%, $n = 54$). A total of 67.2% ($n = 172$) resided in the Jabodetabek area. In terms of telemedicine usage in the past six months, 32.4% ($n = 83$) used it 2–3 times, and 17.2% ($n = 44$) used it seven or more times. Halodoc was the most frequently used platform (56.3%, $n = 144$), followed by Alodokter (27.4%, $n = 70$).

Table 2. Respondent Profile (n = 256)

Description	Item	n	Percentage
Gender	Male	124	48.4%
	Female	132	51.6%
Age	18–24 y.o	79	30.9%
	25–34 y.o	86	33.6%
	35–44 y.o	41	16.0%
	45–54 y.o	25	9.8%
	55–64 y.o	16	6.3%
	≥ 65 y.o	9	3.5%
Education	High school and below	36	14.1%
	Diploma	47	18.4%
	Undergraduate	121	47.3%
	Postgraduate	52	20.3%
Occupation	Student	54	21.1%
	Government	31	12.1%
	Private companies	78	30.5%
	Entrepreneur	32	12.5%
	Professional	22	8.6%
	House wife	14	5.5%
	Others	25	9.8%
Residency	Jabodetabek	172	67.2%
	Outside Jabodetabek	84	32.8%
Use of telemedicine in the past 6 months	1	61	23.8%
	2–3	83	32.4%
	4–6	68	26.6%
	≥ 7	44	17.2%
Most frequently used telemedicine platform	Halodoc	144	56.3%
	Alodokter	70	27.4%
	Others	42	16.3

Normality Test. Prior to conducting the structural equation modeling, the multivariate normality of the data was assessed using Mardia's test of multivariate

kurtosis and skewness (Kres, 1983). The results indicated that the dataset deviated from normality. Specifically, the standardized multivariate kurtosis value was 8.46, which exceeds the threshold of 3, suggesting a high level of non-normality in the data. Given this result, the use of PLS-SEM was deemed appropriate.

Common Method Bias. To assess potential common method bias (CMB), a Harman's single-factor test was conducted by performing an exploratory factor analysis on all measurement items without rotating the components. The total variance explained by the first unrotated factor was 36.2%, which is below the commonly accepted threshold of 50% (Kock, 2021). This indicates that common method bias is unlikely to be a significant concern in the current study, and therefore, it does not substantially affect the validity of the findings.

Outer Model Assessment

Table 3 presents the results of measurement model analysis. Convergent validity was assessed by examining factor loadings and average variance extracted (AVE) (Hair et al., 2010). All indicator loadings were above the recommended threshold of 0.708 indicating strong relationships between items and their respective constructs, except VCC6 (0.644), VCC1 (0.686), VCC6 (0.644) and PPV1 (0.678). However, since the AVE values of their respective constructs are all above 0.500, they are deemed valid and reliable. AVE values for all constructs exceeded 0.50 confirming that each construct explains more than 50% of the variance in its indicators, thus supporting convergent validity.

Table 3. Analysis of Outer Model

Construct & Indicator	SLF	Cr. α	CR (Rho_A)	AVE	t-value
Intrinsic Motivation		0.729	0.738	0.549	
INT1	0.718				20.567
INT 2	0.771				34.432
INT 3	0.765				23.921
INT 4	0.709				17.303
External Regulation		0.714	0.721	0.532	
EXT1	0.778				13.430
EXT 2	0.761				21.539
EXT 3	0.756				18.284
EXT 4	0.720				21.765
Identified Regulation		0.714	0.721	0.532	
IDE1	0.778				13.430
IDE2	0.761				21.539
IDE3	0.756				18.284
IDE4	0.720				21.765
Value CoCreation Behavior		0.736	0.745	0.530	
VCC1	0.686				17.821
VCC2	0.706				24.589
VCC3	0.788				12.407
VCC4	0.735				14.747
VCC5	0.769				18.201
VCC6	0.644				15.178
Patient Perceived Value		0.849	0.873	0.572	
PPV1	0.678				11.434
PPV2	0.756				12.956

PPV3	0.660			11.979
PPV4	0.843			46.611
PPV5	0.837			37.257
PPV6	0.834			43.035
Patient Well-Being		0.885	0.890	0.635
WBE1	0.739			19.831
WBE 2	0.842			42.549
WBE 3	0.863			45.238
WBE 4	0.783			20.500
WBE 5	0.781			21.455
WBE 6	0.767			24.173

One-tailed and all significant p-values <0.005

Reliability was assessed using Cronbach's alpha, composite reliability (CR), and rho_A. Cronbach's alpha values ranged from 0.81 to 0.89, composite reliability ranged from 0.86 to 0.93, and rho_A values were between 0.84 and 0.91, all surpassing the minimum acceptable threshold of 0.70 (Hair et al., 2021a). These results indicate satisfactory internal consistency and reliability of the measurement scales.

Table 4 presents the results of discriminant validity analysis. Discriminant validity was assessed using the heterotraitmonotrait ratio of correlations (HTMT) as developed by Henseler et al. (2015). The HTMT evaluates the ratio of the correlation between constructs (heterotraitheteromethod correlations) to the correlation within constructs (monotraitheteromethod correlations). Values close to or exceeding 1 suggest insufficient discriminant validity. In this study, all HTMT values were below the conservative threshold of 0.90, ranging from 0.67 to 0.849, indicating that the constructs are empirically distinct and share less common variance than would be expected if they measured the same underlying concept. This provides strong evidence of adequate discriminant validity among all latent variables in the model.

Table 4. Discriminant Validity with HTMT

	1	2	3	4	5	6
EXT						
IDE	0.802					
INT	0.893	0.762				
PPV	0.071	0.117	0.082			
VCC	0.849	0.830	0.818	0.084		
WBE	0.050	0.084	0.052	0.845	0.081	

Structural Model Results

Prior to assessing the structural model, a collinearity analysis was conducted to ensure that multicollinearity among predictor constructs did not distort the estimation of path coefficients. Variance inflation factor (VIF) values were examined for all independent constructs involved in the structural relationships. According to established guidelines (Hair et al., 2021b), VIF values below 5 indicate acceptable levels of multicollinearity, with values below 3 considered ideal. The obtained VIF values for all predictor constructs were well within these thresholds.

Relationship between variables

Bootstrapping with 5,000 resamples was conducted to test the significance of the path estimates. The results revealed several statistically significant relationships at the $p < 0.05$ level or better. Specifically, intrinsic motivation had a positive and significant effect on value cocreation behavior (ß 0.280   0.000), supporting H1. External regulation showed a smaller but still significant positive relationship with value cocreation behavior (ß = 0.253, p<0.05), supporting H2. Identified regulation demonstrated the strongest influence on value cocreation behavior (ß = 0.312, p < 0.05), confirming H3. In turn, value cocreation behavior significantly predicted both patient perceived value (ß = 0.408, p < 0.05) and patient wellbeing (ß = 0.232, p<0.05), supporting H4 and H5. Finally, patient perceived value was positively related to patient wellbeing (ß = 0.842, p < 0.05), validating H6.

Table 5. Structural Model Analysis

Path	β	t-value	p-value	VIF	f²
Direct effects					
Intrinsic motivation → value cocreation behavior (H1)	0.280	5.113	0.000	2.265	0.076
External regulation → value cocreation behavior (H2)	0.253	4.615	0.000	2.268	0.062
Identified regulation → value cocreation behavior (H3)	0.312	7.281	0.000	1.754	0.122
Value cocreation behavior → Patient perceived value (H4)	0.408	12.145	0.000	1.000	0.010
Value cocreation behavior → Patient well-being (H5)	0.232	10.244	0.000	1.000	0.014
Patient perceived value → Patient well-being (H6)	0.842	46.392	0.000	1.000	2.434
Indirect effect					
INT -> VCC -> PPV	0.002[n.s]	0.143	0.443		
INT -> VCC -> WBE	-0.009[n.s]	1.177	0.120		
EXT -> VCC -> PPV	0.002[n.s]	0.141	0.444		
EXT -> VCC -> WBE	-0.008[n.s]	1.192	0.117		
IDE -> VCC -> PPV	0.002[n.s]	0.142	0.444		
IDE -> VCC -> WBE	-0.010[n.s]	1.200	0.115		
VCC -> PPV -> WBE	0.006[n.s]	0.145	0.443		
R²					
Dependent variables					
Value cocreation behavior	0.540				
Patient perceived value	0.230				
Patient well-being	0.707				

One-tailed, p-value <0.05

Insample predictions (R^2). The R² values indicate the proportion of variance in each endogenous construct explained by its predictors: value cocreation behavior = 0.540, patient perceived value = 0.230, and patient wellbeing = 0.707. These values suggest that the model explains a moderate to high amount of variance in the dependent constructs, indicating good explanatory power.

Effect size (f^2). Effect sizes were calculated using Cohen's f² to assess the substantive impact of exogenous constructs on endogenous variables. The interpretation followed Benitez et al. (2020), the effect of intrinsic motivation on value cocreation behavior was small (f² = 0.076). External regulation showed a small effect on value cocreation behavior (f² = 0.062). Identified regulation exhibited a medium effect size on

value cocreation behavior ($f^2 = 0.122$). The impact of value cocreation behavior on patient perceived value ($f^2 = 0.010$) and patient well-being ($f^2 = 0.014$) was non substantial. Lastly, perceived value had a large effect on patient well-being ($f^2 = 2.434$). These findings suggest that while all predictors contribute meaningfully to the model, identified regulation and value cocreation behavior have the most influential roles in shaping patient outcomes.

Out-sample Predictive Relevance (CVPAT). Table 6 presents the results of the model's out-sample predictive capability through cross-validated predictive ability test (CVPAT).

Table 6. Results of PLSPredict

	Q²predict	PLS-SEM_RMSE	LM_RMSE
PPV1	0.321	**0.719**	0.726
PPV2	0.176	**0.817**	0.825
PPV3	0.266	**0.772**	0.779
PPV4	0.124	**0.683**	0.685
PPV5	0.244	**0.664**	0.665
PPV6	0.276	**0.636**	0.638
VCC1	0.260	0.698	0.691
VCC2	0.360	0.810	0.757
VCC3	0.150	0.685	0.651
VCC4	0.161	0.712	0.712
VCC5	0.214	**0.796**	0.801
VCC6	0.187	0.921	0.920
WBE1	0.002	**0.798**	0.800
WBE2	0.211	**0.673**	0.679
WBE3	0.156	**0.737**	0.747
WBE4	0.277	**0.903**	0.913
WBE5	0.134	**0.736**	0.746
WBE6	0.166	**0.875**	0.888

The capability of the model to predict data outside this study is relatively moderate to strong as suggested by (Shmueli et al., 2019). To validate the appropriateness of the measurement model specifications, CVPAT was conducted. This test compares the fit of the original PLS model with an alternative (formative) model through loss function differences, t-values, and significance levels. In conclusion, while most constructs align with the assumed reflective measurement model, special attention should be given to patient perceived value and patient well-being, which show weaker or conflicting evidence, potentially indicating issues with their current model specification.

Discussion

The findings of this study provide empirical support for the role of patient motivation in shaping value cocreation behavior within telemedicine contexts. Consistent with SDT, intrinsic motivation and identified regulation emerged as stronger predictors of cocreation compared to external regulation. This suggests that patients who personally value telemedicine services or find them inherently meaningful are more likely to actively

contribute to the care process—such as by sharing detailed health information, asking clarifying questions, or following medical advice.

These results align with SDL, which emphasizes that value is not delivered but cocreated through patient provider interaction. The significant impact of value cocreation on both perceived value and wellbeing reinforces the idea that active patient involvement enhances their overall healthcare experience and emotional state. Notably, the strong relationship between perceived value and wellbeing indicates that when patients feel their time and effort in using telemedicine are worthwhile, they also report higher levels of satisfaction and psychological comfort.

While external regulation showed a weaker influence, its positive and significant effect highlights the importance of contextual incentives—such as cost savings or insurance requirements—in initiating patient engagement. This implies that while extrinsic motivators may serve as entry points into digital health systems, fostering internalized motivations should be a long-term goal for sustainable telemedicine use.

Conclusion

This study contributes to the growing body of research on patient engagement in telemedicine by examining how different types of motivation drive value cocreation behavior and ultimately influence key patient outcomes. Using an integrated framework based on SDT and SDL, the findings demonstrate that value cocreation is not only shaped by the functionality of telemedicine platforms but also by the psychological drivers underlying patient participation.

The results indicate that identified regulation has the strongest influence on cocreation behaviors, followed by intrinsic motivation, suggesting that patients are more likely to engage meaningfully when they perceive telemedicine as personally relevant and beneficial. Moreover, value cocreation behavior significantly enhances both perceived value and wellbeing, underscoring the importance of designing digital health services that foster active and autonomous patient involvement.

Overall, this research supports the view that telemedicine is not merely a technological innovation but a socio behavioral transformation in healthcare delivery. Future studies may explore longitudinal effects of motivational shifts over time or examine these relationships across diverse cultural and socioeconomic contexts.

This study makes several contributions to theory, particularly in bridging SDT and SDL within the context of telemedicine. First, it extends SDT's application beyond educational and workplace settings to digital health environments, demonstrating that the continuum of behavioral regulation applies equally to patient engagement in virtual care.

Second, the findings reinforce SDL's assertion that value is cocreated rather than unilaterally delivered. By empirically linking motivational drivers to cocreation behaviors and subsequent outcomes, this study provides a nuanced understanding of how autonomy and agency shape value generation in healthcare.

Third, the integration of these two theoretical perspectives offers a more comprehensive lens for studying patient behavior in digital service ecosystems. While SDT explains why patients engage, SDL explains how that engagement leads to value creation. This dual theory approach opens new avenues for future research on behavioral dynamics in health service design and digital platform interactions.

Finally, the confirmation of a sequential model adds to the nomological network of constructs in digital health literature, offering a replicable framework for scholars investigating user behavior in e-health and beyond.

Managerial Implications

The findings offer actionable insights for healthcare providers, policymakers, and telemedicine platform developers seeking to enhance patient engagement and improve service outcomes. First, telemedicine platforms should be designed to support autonomy, competence, and relatedness, the three core psychological needs emphasized in SDT. For example, features such as personalized dashboards, interactive decision aids, and follow-up reminders can help patients feel more in control of their health journey and more connected to their care providers. Second, since identified regulation was found to have the strongest impact on value cocreation, efforts should be made to communicate the personal relevance of telemedicine services. Educational campaigns and targeted messaging can help users understand how online consultations contribute to their long-term health goals, thereby increasing internalization of the behavior. Third, although external regulation had a weaker effect, it still played a role in encouraging initial engagement. Therefore, short-term incentives such as subsidized fees, insurance coverage, or employer sponsored programs may serve as effective entry points for attracting new users to telemedicine platforms. Lastly, given the strong link between value cocreation and wellbeing, improving the quality of patient interaction during virtual consultations—through empathetic communication, clear explanations, and shared decision-making—can significantly enhance both satisfaction and health-related quality of life.

Study Limitations

Several limitations should be acknowledged to guide future research and interpretation of findings. First, the sample was limited to telemedicine users in Greater Jakarta, potentially affecting the generalizability of the findings to other regions or populations with different digital literacy levels, socioeconomic backgrounds, or healthcare access conditions. Future research could expand the scope to include rural areas or diverse cultural settings to enhance external validity. Second, while the study focused on intrinsic motivation, external regulation, and identified regulation, it did not include introjected regulation, another form of extrinsic motivation that may also play a role in shaping patient behavior. Including this dimension in future studies could offer a more complete picture of motivational influences in telemedicine. Finally, the model did not account for potential moderating variables such as age, health literacy, or chronic condition status, which may influence how patients engage with digital health services. Investigating these factors in future research can further refine the understanding of value cocreation in diverse patient populations.

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