Value co-creation on a shared healthcare platform: Impact on service innovation, perceived value and patient welfare

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Abstract

The exponential rise of sharing economy has accelerated the growth of shared healthcare platforms in recent times. Although a shared healthcare platform transforms the exchange of service offerings, insight remains elusive regarding its value co-creation (VCC) dynamics and their effects. Drawing on the DART (dialogue, access, risk assessment, transparency) framework, this study frames the overall effects of VCC on perceived service innovation, perceived value and patient welfare. Data were collected from 251 patients from a shared healthcare platform. The findings confirm the elements of the DART framework as the antecedents of VCC of a shared healthcare platform, which significantly influence critical service outcomes.

1. Introduction

In the emerging sharing economy, the exponential growth of digital platforms has expanded the boundaries of servicescape and value co-creation (VCC) through fast and efficient access to various resources at a reduced cost (Cheng, Fu, Sun, Bilgihan, & Okumus, 2019; Edvardsson, Tronvoll, & Gruber, 2011; Frey, Trenz, & Veit, 2019). Sharing economy is defined as "a scalable socio-economic system that employs technology-enabled platforms to provide users with temporary access to tangible and intangible resources that may be crowdsourced" (Eckhardt et al., 2019, p.7). Sharing economy services have increased exponentially over recent years, with many expecting this trend to continue (Lee, Hakstian, & Williams, 2021), with the total value of the global sharing economy predicted to increase to 335 billion U.S. dollars by 2025, from only 15 billion U.S. dollars in 2014 (Statista, 2020; PWC, 2015). Davlembayeva, Papagiannidis and Alamanos (2019) suggested that the sharing economy has been characterized by the nature of practices (social interaction or economic transaction), the type of reciprocation for access to a resource (generalized or compensated), the context where practices are performed (market-based or communal environment) and the role of technology enabling the collaboration between parties. Perren and Kozinets (2018) emphasized two dimensions, such as the extent of consociality and platform intermediation, to categorize the sharing economy-based markets, which are forums, enablers and hubs.

From service delivery system perspective, VCC is regarded as a resource integration process where various parties (e.g., service providers and consumers) engage in a process to perform a common task which is co-creating value through the integration of resources (Grönroos & Voima, 2013; Lusch & Vargo, 2014; Vargo & Lusch, 2008). Therefore, VCC is the process which increases value for the customers and the service suppliers who were involved (Vargo and Lusch, 2004). Dialogue with customers is one of the key factors in enhancing VCC (Ma, Gu, Wang, & Hampson, 2017). In addition, the actors' (customer or service provider) access

to solutions, transparency, and their own resource deficiencies play a very important role in shaping up the decision to co-create (Frow, McColl-Kennedy, & Payne, 2016). VCC has received research attention in the context of sharing economy in recent years (Camilleri & Neuhofer, 2017; Du & Chou, 2020; Frey et al., 2019; Nadeem, Juntunen, Shirazi, & Hajli, 2020; Singh, Crisafulli, & Benoit, 2018; Zhang, Jahromi, & Kizildag, 2018). Previous studies have explored VCC in the context of hospitality, transportation and ethical understanding (Buhalis & Sinarta, 2019; Chathoth, Ungson, Hrrington & Chan, 2016; Zhang, Li & Wang, 2021; Nadeem et al., 2020).

A shared-service ecosystem is composed of various actors (e.g., organizations, customers, service delivery system, employees and technology) and their respective resources, which are linked together in a network of relationships (Frow et al., 2014). In this study, we have chosen *Shastho Batayon* as the sharing platform, which works both as a "platform" and an "ecosystem" as it provides healthcare solutions and enables various economic actors to interlink. *Shastho Batayon*, through a technology-based platform, offers critical, real-time healthcare services to patients across the country. This also functions as a dynamic ecosystem as it facilitates actors to participate, co-create value, and innovate services. Moreover, it has enabled various economic actors to exchange resources through a virtual interface to enhance wellbeing. However, the nature of this process and especially the forms and roles of co-creation practices in shaping the ecosystem of connected actors are still unexplored (Frow et al., 2016), particularly for healthcare services. Healthcare varies from context to context and by its application of technology to facilitate VCC and service innovation (Frey et al., 2019). Indeed, achieving healthy wellbeing through a collaborative effort between the actors of the shared healthcare ecosystem should receive further research interest as it has both academic and practical implications. In the extant literature, an investigation into value co-creation practices of a shared-healthcare platform and its impact on various service outcomes has received limited

research attention (Davey & Grönroos, 2019; Elg, Engström, Witell, & Poksinska, 2012; Frow et al., 2016; Hardyman, Daunt, & Kitchener, 2015; Zhao, Wang, & Fan, 2015).

Utilizing the characteristics and dimensions of the sharing economy, this study focuses on a shared healthcare platform in a developing country, which allows temporary access to health services, exchanges with economic value, transactions facilitated by a technology platform and co-creation of value by customers and providers (Eckhardt et al. 2019). Healthcare services, particularly in developing countries, face serious issues and requires the adoption of innovative solutions (Ariani, Koesoema & Soegijoko 2017; Rajasekera, Mishal & Mori, 2020; Chib, van Velthoven & Car, 2015). Enabling value co-creation through a healthcare service platform can positively influence customers' (patients) perceived value and welfare. The adoption of sharing economy approach in healthcare could result in a positive outcome as it facilitates more flexible creation of necessary connections between patients and service providers through a centralized platform, including services co-created and provided between patients (Wu, Chan, Zhang, & Ming, 2019; Javed et al., 2020; Bitar, 2020). The present-day, shared-health platform represents a complex service ecosystem comprised of physicians, clinicians, nurses, and allied health professionals (Zhao et al., 2015). In this system, patients are viewed as active contributors who co-create values to enhance their lifestyle and welfare (Anderson et al., 2013; Ostrom, Parasuraman, Bowen, Patrício, & Voss, 2015; Sharma, Conduit, & Hill, 2017). From a patient's perspective, achieving the right and timely health services at a lower cost from any location is a critical outcome of a shared-health service platform. Indeed, a shared healthcare platform plays a pivotal role to reduce costs and uncertainties while providing innovative solutions. This is more important from the developing countries' perspective as the government struggles to manage its limited resources to provide health support for its people (Akter, Wamba, & D'Ambra, 2019). The sharing economy, using mobile and internet technology, can play an instrumental role to allocate and optimize the limited resources to extend health-related

services to more people. As evident in the literature, sharing economy expands the boundary of primary healthcare, reduces waiting time and utilizes medical resources in a cost-effective way. Although transformative health service research has received attention in recent years (Anderson et al., 2013; Ostrom et al., 2015), very limited attention has been given to the dimensions and effects of a shared-healthcare platform (Buhalis, Andreu, & Gnoth, 2020; Sharma et al., 2017). Moreover, we have a very limited empirical understanding of how such a shared-healthcare platform affects VCC and how VCC results in various outcomes such as perceived value, service innovation and customer welfare. Therefore, to address this important issue of providing healthcare support, the primary objective of this study is to understand how patients co-create value through a shared healthcare platform and its effects on critical outcome constructs.

As evident in the extant literature, most of the scholarly work on the sharing economy has emphasized the interaction among different actors of the service ecosystem (Du & Chou, 2020). However, individual-level research into sharing economy is an emerging field and yet to receive much scholarly attention (Lee, Chan, Balaji, & Chong, 2018; Nadeem, Juntunen, Hajli, & Tajvidi, 2019). Since the customer and service providers' roles are not clearly differentiated, mapping the co-creation activities performed by customers during the process remains a fundamental issue for detailed exploration (Tommasetti, Troisi & Vesci, 2017). This bears importance as it enables the actors on a sharing platform to develop a positive relationship between the supply and the demand sides that co-create value through shared inventiveness, co-design, or joint production of services (Benoit, Baker, Bolton, Gruber, & Kandampully, 2017). As such, this research answers the following research question:

RQ: How does patient-perceived value co-creation influence service innovation and patient welfare in the context of a shared healthcare platform?

The current study will address this research question while validating the key drivers of VCC in a shared healthcare context in developing countries. Theoretically, we build on the existing VCC construct using the DART framework (dialogue, access, risk and transparency) (González-Mansilla et al., 2019; Prahalad and Ramaswamy 2004a,b) to extend this line of research by modelling its effects on service innovation, value and customer welfare. The extant literature often focuses on the economic outcome (e.g., firm performance or customer value) of VCC. However, our study contributes to the social outcome (i.e., customer welfare) of VCC by framing its effects through service innovation. Practically, understanding each driver of the VCC framework and assessing their effects on perceived service innovation, value, and welfare will enable managers to develop the most effective interventions in the context of a shared healthcare platform in the developing world.

2. Literature Review, Hypotheses Development and Research Model

2.1 Value co-creation and service innovation in sharing economy aspect

The "sharing economy" expression was initially anticipated in 2008 by Harvard Law School's Professor Lawrence Lessig (Kim, Yoon, & Zo, 2015; Zhang et al., 2018). Academic research on this aspect has gained momentum in subsequent years (e.g., Fehrer et al., 2018; Kumar, Lahiri, & Dogan, 2018; Ma, Gu, Hampson, & Wang, 2019; Nadeem & Al-Imamy, 2020; Netter, Pedersen, & Lüdeke-Freund, 2019; Yin, Qian, & Shen, 2019). The sharing economy exhibits the economic landscape's widespread transformation where traditional markets are shifting to a new paradigm due to excessive connectivity, social interaction, and engagement among actors (Fehrer et al., 2018). These interactions and involvement accelerate through information technology (Hall, 2020; Xue, Liang, Xie, & Wang, 2020). With the widespread use of advanced technology (Chahal & Kumar, 2014; Hossain, Akter, & Yanamandram, 2020), a sharing economy perspective allows people to collectively utilize underused inventory on a sharing platform through fee-based activities (Eckhardt & Bardhi, 2015). A sharing economy

is precisely associated with value co-creation, where value is jointly created by both users and service providers in order to gain monetary benefit and experience (Zhang et al., 2018).

The sharing economy's fundamental participants remain the customers who co-create value continuously with firms and other customers (Nadeem et al., 2020). Value co-creation introduces a method in which several individuals contribute to valued outcomes (Prahalad & Ramaswamy, 2004a). In other words, this co-creation also leads to shared value creation, both tangibly and intangibly (Galvagno & Dalli, 2014). Thus, the idea of value co-creation is becoming more popular among firms that help to interact with customers and act as a determinant of a new service or product success (Eggert, Ulaga, Frow, & Payne, 2018; Go Jefferies, Bishop, & Hibbert, 2019; Gustafsson, Kristensson, & Witell, 2012; Ma et al., 2017; Sjödin, Parida, Kohtamäki, & Wincent, 2020).

At the beginning of this century, scholars like Prahalad and Ramaswamy (2000) acknowledged consumer and business co-creation as the mediator of supply and demand that communicate and cooperate beyond the existing value chain model. Afterwards, Prahalad and Ramaswamy (2004b) critique Porter's (1985) value chain concept as the concept overlooks the customer's position in the value creation method. The contention's premise was that the producer alone could not produce value as they require communication with the customers to create the ideas of uncovering value. Customers act as engaged informers because their knowledge help firms to serve customers better (Blazevic & Lievens, 2008). In a similar vein, Gustafsson et al. (2012) mentioned new offerings based on co-creation with customers are more effective than the traditional process. Further, in an intangible service setting, a firm generates solutions through co-creation with customers (Zhang, Zhao, Voss, & Zhu, 2016). Akhmedova, Mas-Machuca, and Marimon (2020) argue that the quality of service partly depends on a sharing platform because a platform can prevent transactions between the customer and the service provider. In

the paradigm of value co-creation and service quality, one stream of research acknowledged the importance of value co-creation in service innovation (Islam, Agarwal, & Ikeda, 2015; Perks, Gruber, & Edvardsson, 2012), and another stream of research explains the relationship between platform service innovation and value co-creation pursuance (Fu, Wang, & Zhao, 2017; Yu, Wen, Jin, & Zhang, 2019).

Besides, a recent article acknowledges that the healthcare system can be inspired by the globally emerging trend of a sharing economy (Wu et al., 2019). The development of shared healthcare via digital platforms significantly improves human development and market performance (Donner & Escobari, 2010; Thapa & Sæbø, 2014). Shared healthcare services have gained momentum in the developing world (Akter et al., 2019; Dey, Babu, Rahman, Dora, & Mishra, 2019). Despite its importance, healthcare service research via shared-platform has received little attention in the academic literature though it gained acceleration in the real-life scenario during the COVID-19 pandemic (Guoxio, 2020). Thus, to further understand this healthcare issue in the sharing economy, value co-creation, and service innovation aspect, the study develops hypotheses in the following sections to test our conceptual model.

2.2 Value co-creation (VCC), perceived service innovation, and perceived value in a shared healthcare platform

The healthcare industry is currently enduring a technological transformation delineated by the promptness of innovation processes (Schiavone, Leone, Sorrentino, & Scaletti, 2020; Skaria, Satam, & Khalpey, 2020). The emerging technology-oriented pattern triggers sharing economy where the principles are maintained by a robust platform to co-create value between consumers and service providers (Schiavone et al., 2020). Health care consumers must actively participate (Damali, Miller, Fredendall, Moore, & Dye, 2016; Dellande, Gilly, & Graham, 2004; Zainuddin, Tam, & McCosker, 2016) and cooperate with healthcare providers to co-create

value and successfully treat a disease (McColl-Kennedy, Vargo, Dagger, Sweeney, & Kasteren, 2012; Sweeney, Danaher, & McColl-Kennedy, 2015). Despite the importance of VCC in shared healthcare, there is a lack of empirical studies on VCC's underlying dimensions in the platform-based shared healthcare aspect (Beirão, Patrício, & Fisk, 2017; Kim, 2019; Van Oerle, Lievens, & Mahr, 2018). Thus, it is vital to understand the underlying DART (dialogue, access, risk, transparency) model of VCC and its impact in this aspect so that practitioners can learn how to manage this process correctly to ensure an individual's welfare (Anderson et al., 2013; González-Mansilla, Berenguer-Contrí, & Serra-Cantallops, 2019; McColl-Kennedy et al., 2017b).

Hence, a firm's value co-creation proceeds through co-working with customers (Cui & Wu, 2016; Sweeney et al., 2015), where DART elements play a crucial role. The term *dialogue* refers to the continuous interactions between the consumer (e.g., healthcare patient) and service providers (e.g., platform-driven healthcare provider) in a freewheeling content-rich way (Zaborek & Mazur, 2019). The service provider can understand customer needs by interacting with them (Merz, He, & Vargo, 2009), and this interactive exchange also guide to a generation of customer-centric solutions (Bagozzi et al., 2012). *Access* to the (healthcare) customers' preferences is the core to achieving the business goal where customer's ideas and firms' implications in regards to the customers' views can produce a competent service (Budzik, Hammond, & Birnbaum, 2001; Joshi & Sharma, 2004; Satyanarayanan, 1996). Thus, a service provider should consider the customers' role to be as crucial as its own. As health care customers become co-creators of value, they aspire to know more information on the inherent *risk* of consuming, delivering, and producing particular services or products. A firm is responsible for the risks associated with a service or product offering (Ramaswamy, 2005; Taghizadeh, Jayaraman, Ismail, & Rahman, 2016). A firm should have an obligation to inform the customer regarding the potential risk of involving a particular service or product (Prahalad

& Ramaswamy, 2001). Thus, in the value co-creation process, the risk plays a crucial role. Another vital element in healthcare value co-creation is *transparency*, which refers to equity while discussing value co-creation (Ranjan & Read, 2016). The essence of equity is the empowerment of consumers that generates through the service provider's willingness to share transparent information; thus, the co-creation activities take place effectively (Bolton & Saxena-Iyer, 2009; Hoyer, Chandy, Dorotic, Krafft, & Singh, 2010). Overall, transparent information is essential to generate meaningful co-creation and improve service (González-Mansilla et al., 2019).

Successful implementation of the value co-creation process guides breakthrough service innovation and offers successful service solutions (Sheth, 2019; Sjödin et al., 2020). Service innovation is defined here as adding something distinct into the tone of life, business, timing, and position of what can usually be expressed as the person and cooperative processes associated with customers (Carlborg, Kindström, & Kowalkowski, 2014; Kao, Pai, Lin, & Zhong, 2015). Customers provide the idea of new services or technology upgrading during co-creation that may satisfy customer's underlying requirements that have not been matched yet by the market or upgrading offerings (Chathoth, Altinay, Harrington, Okumus, & Chan, 2013; Dey et al., 2019). Thus, idea generation on the verge of co-creation is the ultimate mirror of customers' (e.g., patients') needs. It has been realized that the development of new products or innovative services depends on an extensive understanding of customer needs (Hauser, Tellis, & Griffin, 2006). More precise alignment between the customer's needs and the customized service can enhance the probability of accomplishment for innovative services (Lusch, Vargo, & O'brien, 2007). In a similar vein, Hsieh and Hsieh (2015) also acknowledge the importance of co-creation as useful for service innovation. Based on the discussions, we argue that patient value co-creation through the healthcare platform is the prime source of health care service innovation. Therefore, the study proposes the following hypothesis.

H1: Patient perceived value co-creation positively affects patient-perceived service innovation.

The thought of service innovation leads to a sense of perceived value (Boxer & Rekettye, 2011). According to Yi and La (2004); Boxer and Rekettye (2011), value perception depends on product or service innovativeness, quality and excellence, and any other relevant cues that the consumer deems essential, leading consumers to choose the service or product that presents the substantial value. Perceived value has been defined as a ratio of total gains expected to total sacrifices (González-Mansilla et al., 2019; Patterson & Spreng, 1997). The perceived value's ultimate idea is the customer's overall perception-based assessment of a particular product or service regarding what is received and given (Itani, Kassar, & Loureiro, 2019; Zeithaml, 1988). Extant studies connect the relationship between service innovation and customer value (e.g., Barrett et al., 2015; Flint, 2006). Thus, the study argues that patient value co-creation is the source of service innovation in the health care platform that generates ultimate value for patients by providing superior services (e.g., availability of 24 hours online health service using platform). Therefore, we propose the following hypothesis.

H2: Patient perceived service innovation positively affects patient-perceived value.

The interaction between service providers and users in a shared platform generally co-creates value (Fang, Palmatier, & Evans, 2008). It has been observed that a patient can interact with a health care service provider using a health care platform (Akareem, Ferdous, & Todd, 2020). Although there is a link between the perception of service innovation and perceived value, extant studies also further establish a direct relationship between value co-creation and customers' perceived value (Hau, Anh, & Thuy, 2017; Prebensen & Xie, 2017). Consumer's perception of value proceeds through experiential consumption is all about 'value in use' as the consumer is individually present in the situations in which the action value is co-created

(Grönroos, 2011; Prebensen & Xie, 2017). For example, a patient can use the health care platform to consult with doctors regarding the patient's health issue is part of value co-creation. The ultimate result or value after the consultation is the online prescription to buy medicine. Despite the relationship between perceived value co-creation and perceived value, none of the academic research empirically investigated the fact in the context of the shared healthcare platform. Therefore, we put forward the following hypothesis in this context.

H3: Patient perceived value co-creation positively affects patient-perceived value.

2.3 Value co-creation, perceived service innovation, and patient welfare

Academic researchers and practitioners are highly interested in researching customers' welfare perception as a significant outcome construct in health care research (Berry & Bendapudi, 2007; McColl-Kennedy, Hogan, Witell, & Snyder, 2017a). The concept of customer welfare reaches beyond satisfaction (Pancer & Handelman, 2012), which counts objective living conditions, subjective wellbeing and (perceived) quality of society (Delhey, Böhnke, Habich, & Zapf, 2002; Leo, 2013). However, quality of life is an individual's (or a customer's) welfare that produces the right objective living conditions and subjective wellbeing (Delhey et al., 2002). Thus, this study has considered the term customer welfare as equivalent to a customer's quality of life. Similarly, Diener, Oishi, and Lucas (2003); Ostrom et al. (2015) view welfare or wellbeing as a quality of life, indicating the effectiveness of treatment from health care service and quality experience outcome (such as happiness) (McColl-Kennedy et al., 2017a).

A patient can share information, ask physicians about health issues, and provide feedback altogether co-create value in the platform where patients' can actively involve managing their own illness that positively affects their health outcomes (e.g., good health) (McColl-Kennedy et al., 2017a). However, critics suggest that such innovation does not always generate value or welfare for all customers. Some customers try to avoid new technological advancements due

to the complexity and lack of trust (Rahman, Zaman, & Hossain, 2019; Tung, Chang, & Chou, 2008). Despite this fact, extant research emphasizes the patient-centred approach where patients can manage the day-to-day health care responsibility (Barlow, Wright, Sheaby, Turner, & Hainsworth, 2002), and this approach is possible due to service innovation (Bouwman, de Vos, & Haaker, 2008). Furthermore, another stream of research considers innovation directly leads to customer welfare (Beetz & Neu, 2006; Edwards-Schachter, Matti, & Alcántara, 2012). Thus, this study proposes the following hypothesis.

H4: Patient perceived service innovation positively affects perceived patient welfare.

Further, services to be delivered to the customers contain tangible or intangible offerings where the base is exchanging information that helps co-create value (Vargo & Lusch, 2004). It seems information drives service as a process rather than considered a production unit that can be consumed (Lusch & Nambisan, 2015). Service innovation and the innovative offering using information have been considered two sides of the same coin (Rust, 2004). Particularly, service innovation is viewed as a novel resource created by combining unique resources within a given context (Barrett, Davidson, Prabhu, & Vargo, 2015; Lusch & Nambisan, 2015). Vargo and Lusch (2008) mentioned in their research that service providers and customers create value through the activation of a set of operand and operant resources. Operand resources act as a facilitator (e.g., base) to form service support; in contrast, operant resources are intangible and robust (e.g., skills) that perform on other resources to generate results (Barrett et al., 2015). Therefore, resource liquefaction and integration are required in platform-driven value co-creation to assist actors in their continuous service exchange activities (Lusch & Nambisan, 2015). Service innovation results from the service platform activities impact customer welfare as interaction occurs with many actors and discovers an innovative explication to the problem (Babu et al., 2020; Lusch & Nambisan, 2015).

Although, customer welfare construct attached to numerous variables has been researched in various impactful domains such as tourism, hospitality, health care, retail services, etc. (Han, Jongsik, & Hyun, 2020; Lee, Sirgy, Larsen, & Wright, 2002; McColl-Kennedy et al., 2017a; Troebs, Wagner, & Heidemann, 2018). However, there is still scant empirical research evidence that persists, particularly in the platform-driven shared healthcare aspect, by connecting crucial constructs: value co-creation and customer welfare. Therefore, this research proposes the following hypothesis.

H5: Patient perceived value co-creation positively affects perceived patient welfare.

Extant research indicates that perceived service innovation is all about the service's meaningfulness that generates the perceived quality (e.g., perceived value) of a service, leading to customer welfare (Ogunmokun, Unverdi-Creig, Said, Avci, & Eluwole, 2020). In line with the existing viewpoint, in this shared healthcare perspective, we argue that while patients perceive the service as meaningful, it ultimately provides value to them, which stimulates happiness to ensure the quality of life. Eventually, the innovative service generates perceived value (e.g., quality of service) and leads to customer welfare.

However, the connection between patients' perceived value and welfare has not been tested yet in a platform-driven shared healthcare context. Overall, in this context, we argue that patients' perceived value impacts their perception of welfare. Thus, we propose the following hypothesis.

H6: Patient perceived value positively affects perceived patient welfare.

The study put forward the following research model considering the above discussions (see Figure 1).

INSERT FIGURE 1 HERE

3. Research Method

3.1 Measurement scales

Measurement scales were taken from extant studies to estimate the hierarchical VCC using dialogue, access, risk, and transparency (DART) as the first-order constructs (González-Mansilla et al., 2019). The study repeatedly used all the first-order VCC constructs items to evaluate higher-order VCC constructs following repeated estimation procedures guidelines (Becker, Klein, & Wetzels, 2012; Wetzels, Odekerken-Schröder, & Van Oppen, 2009). Based on the past studies, the study also adapted all the outcome constructs. For example, perceived service innovation (PSI) is adapted from Kao et al. (2015), indicating the extent to which the shared service is appropriate and useful relative to competing services. Similarly, perceived value (PVL) is adapted from González-Mansilla et al. (2019), referring to the ratio between perceived cost and benefits in healthcare. Finally, customer welfare (CWL) is defined as an individual perception of overall wellbeing in a particular healthcare context (Akter et al., 2019; El Hedhli, Chebat, & Sirgy, 2013). The study used a seven-point Likert scale ranging from strongly disagree (1) to strongly agree (7) to measure each construct (see Table 2). To contextualize the questionnaire, it was initially developed in English, translated into Bangla (local language) and reverse translated until a panel of experts fluent in both languages confirmed it. The questionnaire was pre-tested with 20 respondents to check wording, format and scale options as part of cultural appropriateness and pilot tested with 50 respondents to check dimensionality of constructs. The study also modeled demographic (i.e., age, income, gender) and situational factors (i.e., cost, past use experience) as control variables.

3.2 Sampling

Data were collected from patients in Bangladesh between August-September 2020, who had the experience of using a shared healthcare platform known as *Shastho Batayon*. Although Bangladesh is one of the emerging economies in the developing world, more than 60% of its

160 million people live in rural areas, and around 10% of them live in extreme poverty, on less than the US $1.90 per day (Hamadani et al., 2020). Due to COVID-19 lockdown, people have experienced wide-ranging adverse health effects on top of coronavirus infection, which includes diabetes, high blood pressure, heart complications, asthma, anxiety, depression, post-traumatic stress disorder etc. We identify *Shastho Batayon as* a shared platform because it allows temporary access, transfer of economic value, platform facilitation and expanded consumer role to receive the service (Eckhardt et al., 2019). It is a 24/7 service set up by the Bangladeshi government in collaboration with the United Nations Development Program (UNDP, 2020). Patients across the country can access this service by calling a toll free number to receive medical consultation and advice from registered doctors. During the Covid-19 lockdown, this shared platform served 3,04,042 patients between 18th June to 5th September 2020 (The-Financial-Express, 2020).

Using a professional market research firm, we approached 536 respondents using mobile telephones, and 272 (51%) completed the survey. Due to missing values and inconsistent answers, we excluded 21 responses, and finally, 251 respondents' responses were analyzed. A diversity in sample demography was reflected in terms of age, gender, geographic location, education and occupation. Table 1 shows that a relatively higher percentage of female patients (62%) and rural patients (55%) used this service. A significant percentage of patients are stay-at-home spouses (41%). Out of all patients, 43% have less than $50 income per month, and 67% have year-12 or less educational experiences (see table 1).

INSERT TABLE 1 HERE

3.3 Non-response bias and common method variance (CMV)

Since the study recruited a professional market research firm to collect data using telephone interviews, thus an analysis of non-response bias was conducted over the first and last 20% responses using a paired t-test where significant differences were absent (Stanko, Molina-

Castillo, & Munuera-Aleman, 2012). The study also pursued both priori and post-hoc procedures to address CMV issues suggested in high-impact studies (Hulland, Baumgartner, & Smith, 2018). For instance, the study separated VCC and outcome variables (i.e., perceived service innovation, perceived value, and customer welfare) in the questionnaire design and data collection phase. The study conducted marker variable analysis as part of the post-hoc process (Lindell & Whitney, 2001), where the result produced low correlations that were not significant ($r=0.02$-0.03, $p>0.05$).

3.4 Data analysis

The study applied SmartPLS 3.0 (Ringle, Wende, & Becker, 2014) to estimate the measurement and structural model. Since Partial Least Squares (PLS)-Structural Equation Modeling (SEM) is based on the assurance of factor determinacy, factor identification and robust prediction due to its soft modeling assumptions, it is suitable for embracing parsimony and simplicity in estimating complex relationships (Akter, Fosso Wamba, & Dewan, 2017; Chin, 2010). Since VCC is a higher-order construct; thus, following the recommendation of Becker et al. (2012) and Wetzels et al. (2009), the study repeatedly counts first-order constructs items to estimate higher-order VCC. In order to assess the model parameters (e.g., path coefficients and standard errors), we applied standard PLS algorithm with a nonparametric bootstrapping of 5000 replications and a path weighting scheme for the inside approximation (Ringle et al., 2015).

3.5 Measurement model

The study argues that VCC is a reflective-formative higher-order construct containing first-order dialogue, access, risk, and transparency dimensions. Thus, the analysis estimates VCC dimensions latent scores in first-order along with PVL and CWL. The findings of the measurement model establish the reliability where items loadings are above the threshold of

0.70 (see Table 2). Composite reliability (CR) values were higher than 0.80 confirms further reliability of the constructs. Average variance extracted (AVE) values were higher than 0.50, confirming convergent validity (Hair, Risher, Sarstedt, & Ringle, 2019). The square root of the AVEs in the diagonals exceeds the latent variables' correlations, literally confirming the discriminant validity (see Table 3). Then the study evaluates the heterotrait-monotrait (HTMT) values, where all the results are smaller than 0.90, further supporting discriminant validity. The findings confirm the study's reliability, convergent validity, and discriminant validity that support the overall measurement model.

INSERT TABLE 2 HERE

In order to assess the measurement properties of the higher-order VCC construct, the study estimates 12 items, which represent dialogue, access, risk and transparency. Due to the formative nature of the second-order VCC construct, the study verifies weights of the higher-order VCC construct that prove significant ($p<0.001$), and VIF values also stay within the valid range of collinearity index (≤ 5). In addition, the study met the required thresholds of redundancy analysis ($\beta > 0.70$ between VCC and a global item) and collinearity index (VIF<3 among the lower-order constructs of VCC) (Sarstedt et al. 2019).

INSERT TABLE 3 HERE

3.6 Structural model

The study estimates path-coefficients (β), effect size (f^2), predictive validity (Q^2), coefficient of determination (R^2), and PLSpredict values as part of testing the hypothetical relationships. The findings in Table 4 and Figure 2 verify that VCC-PSI connection is significant ($\beta=0.749$, $p<0.001$). Likewise, PSI-PVL ($\beta=0.524$, $p<0.001$) and VCC-PVL ($\beta=0.261$, $p<0.001$) are significant. Therefore, the results of the findings provide support for H1, H2, and H3. The study further estimates the relationship between PSI-CWL ($\beta=0.310$, $p<0.001$), VCC-CWL ($\beta=0.270$, $p<0.001$), and PVL-CWL ($\beta=0.310$, $p<0.001$), which are significant and support H4,

H5, and H6 (see Table 4). Further, the result shows the effects of individual demographic (age, gender & income) and situational (cost & experience) factors on the outcome constructs (i.e., CWL) are not significant ($p>0.05$).

INSERT FIGURE 2 HERE

INSERT TABLE 4 HERE

The study estimates R^2 of 0.390 for PSI, 0.547 for PVL, and 0.638 for CWL, which supports the goodness of fit and shows the acceptable variance of the outcome variables. The study follows Cohen's (1988) guidelines to check the effect sizes (f^2). The results expose medium and strong effect sizes ranging from 0.150 to >0.350 to explain the hypothesized relationships (H1-H6). The results also support Stone-Geisser's Q^2 predictive validity aspect, showing values of 0.503 for PSI, 0.470 for PVL, and 0.525 for CWL (Chin, 2010). The model's PLS-Predict analysis estimating out of sample predictive validity confirms the study's nomological validity (Shmueli et al., 2019). Hence, the study subdivides the sample with the repetitions of 10 by 10 to compute the residuals histograms, and root mean squared error (RMSE). The results validate the excellent predictive power of the VCC constructs on the ultimate outcome construct CWL.

3.7 Summary of findings

The findings approve VCC as the important antecedent of PSI, PVL, and CWL utilizing survey data from 251 patients using a shared healthcare platform in a developing country. The findings also confirm dialogue ($\beta=0.179$, $p<0.001$), access ($\beta=0.277$, $p<0.001$), risk ($\beta=0.352$, $p<0.001$) and transparency ($\beta=0.452$, $p<0.001$) as the significant dimensions of the higher-order VCC construct. Despite the importance of all these dimensions, the results identify transparency or the empowerment of patients through medical information as the strongest predictor of VCC, followed by risk reduction, easy access, and intensive dialogue in the shared healthcare sector.

The findings of the structural model show that VCC explains 39% of the variance of PSI, 55% of PVL, and 64% of CWL. The findings of the study also demonstrate the insignificant impact of individual control variables: age (β=0.023, p>0.05), gender (β=0.061, p>0.05), income (β=0.052, p>0.05), cost (β=0.032, p>0.05) and experiences (β=0.003, p>0.05) on patient/customer perceived welfare. Since the context of this shared healthcare platform is in a developing country, demographic and situational factors are structured to assure accessibility and affordability irrespective of patients' backgrounds. Therefore, this adjustment is not significantly restricting VCC and its impacts on PVL and CWL.

4.0 Discussion

4.1 Theoretical implications

With the proliferation of the sharing economy, the call for research has become widespread to capture sharing platforms as a game-changer and understand their implications for various industries. The current study gives an understanding of a multidimensional construct of VCC (DART model) in the context of digital healthcare of a shared platform in a developing country in which the healthcare situation is dire. We have selected Bangladesh as a research context because there are only 15 hospital beds and 7 healthcare workers for every 10,000 people in this developing country, but more than 75% of the people have access to mobile phone driven shared healthcare services (Akter et al. 2019).

Service innovation and VCC are integrally related as value creation results from a joint production process in which both the provider and the customer play significant roles (Prahalad & Ramaswamy, 2004a). Direct interaction between health service providers and patients is the key factor in all the models and categorization of VCC. Empirical research on the role of VCC in the sharing economy has addressed various issues; however, it has largely overlooked its activities in healthcare for vulnerable patients in the developing world and their welfare. To the best of our knowledge, this is one of the few studies that examined how VCC dimensions

enhance patients' (customers') perceived service innovation and value and thereby improving their welfare. In the context of sharing economy in general and as a VCC study in particular, it is contributing to the customer welfare literature, which has not yet tapped into this new phenomenon of the health-related sharing economy in the context of a developing world.

The concept of a shared platform is closely related to VCC. The customers' PVL is achieved through value-in-use and experiential consumption (e.g., online medical consultation and prescription) since customers are individually present in the situations in which the VCC has occurred. On the other hand, CWL comprises objective living conditions, subjective wellbeing, and (perceived) quality of society which is beyond mere satisfaction. In the extant literature, research related to CWL has been conducted in various contexts such as tourism, hospitality, health care, retail services, etc. (Han et al., 2020; Lee et al., 2002; McColl-Kennedy et al., 2017a; Troebs et al., 2018); however, there is very limited knowledge, particularly in the health care aspect, which combined three crucial constructs such as VCC, PSI and CWL. Despite the importance of this relationship, none of the academic researches considered the idea in one frame, particularly from the platform-based shared healthcare perspective. This is not only a pioneer contribution but also theoretically an important one, as it will establish the link between the concepts. Furthermore, it will complement the ongoing discussion on co-creation welfare as part of *Transformative Service Research* (TSR), focusing on wellbeing improvement and relieving suffering through service (Chen et al., 2020; Finsterwalder & Kuppelwieser, 2020).

Regarding the relationship between PSI and CWL, there are two streams of research. One stream of research indicated an indirect relationship between the concepts through perceived service quality and perceived value (Ogunmokun et al., 2020). Another stream of research establishes a direct link that leads PSI to customer welfare (Beetz & Neu, 2006; Edwards-Schachter et al., 2012). The findings of our study contribute to both the stream through the

analysis from a health care perspective by suggesting that while patients perceived the service to be valuable and meaningful, they get the happiness that ensures the quality of life and welfare is enhanced.

This study is founded on VCC using the DART as the theoretical framework. Therefore, the findings of this study have interlinked service innovation with VCC in a shared health-service platform. By doing so, this study contributes to contemporary service innovation discourses demonstrating which resources, actors and practices and dimensions (dialogue, access, risk and transparency) of VCC play an important role for value to be extracted in the sharing platform for health-related services.

4.2 Practical implications

Beyond its relevance to theory, the developed framework and study findings offer several strategic implications for the health-related service industry, policymakers and general people. The developed framework could be appraised by the relevant service industry to redefine its scope of operations and service delivery. This study investigated customers' (e.g., patients) health service experience through 'Shastho Batayon', which is a 24/7 online health service providing a platform for medical consultation through registered physicians in Bangladesh. The findings of this study emphasized the key role of a shared platform for health care, which facilitates sharing, learning and connecting people through online and smartphone technology to support the customers (patients) health and social care needs. It shows that sharing platform for health-related services can serve as a platform that connects patients to a more reliable medical experience and reveals what specific resources and practices are needed from several stakeholders for distinct value to emerge. This is a very important finding in the context of a developing economy where it is difficult to provide health services in the nook and corner of the country. As per the United-Nations (2020) report, over 160 million people lack adequate

health facilities, which poses a global health challenge. A shared platform for health services, boosted by technological advancement, can bring positive alteration to this situation as the health services can be expanded.

With the advanced digital technology, the customers (patients) can interact with the service provider and other actors to co-create their value and can improve the standard of life and welfare of vulnerable patients in the developing country. Furthermore, customers' participation in the VCC process through the shared platform indicates that they are keen on sharing their medical issues in quest of innovative service delivery. The traditional service provider can also develop this alternative delivery of service to increase their outreach. The technology service providers can render support for the required operand and operant resources. This can complement the existing service delivery system or can develop an entirely novel service delivery system. As evident, the context and the purposeful investigation of this study highlighted the UN's third most prioritized goal, "Good health and wellbeing." It is our understanding that our findings could be insightful for the policymakers and other organizations to adopt such a platform in delivering not only the health service but also other life-enhancing services, such as education, employment.

4.3 Limitations and future research directions

This study has some limitations which could be addressed in future research attempts. First, the study has been conducted in a developing country and may have a limited transferability to other similar contexts. Future studies may be conducted in different geographic and economic contexts. Second, future research could explore beyond the identified resources, practices and examine if additional outcomes of VCC are possible. Third, we adopted a quantitative research strategy for this study and adapted VCC scale (DART) of González-Mansilla et al. (2019). Future studies could examine the impact of each of the first-order constructs (e.g., Dialogue,

Access, Risk and Transparency) of the VCC scale. VCC could be explored through other measurements such as Ranjan and Read (2016), who considered co-production and value in use as its two constructs. The study might have an issue of self-selection bias as the respondents are current and active users of the platform. Other users who had a different experience with the platform might have a different view of VCC. This confines the findings of the present study as the views of current users. Fourth, in this study, we have not considered a few other factors that may influence the patient's overall experience with health services, such as ease of use, available technological support, internet connection and financial condition. Future studies could address these issues. Finally, future research could use a qualitative approach to bring out more in-depth insight about VCC from sharing economy perspective.

5. Conclusion

In this study, we investigated the development of the value co-creation process and its impact on perceived service innovation, value and customer welfare in a shared health service platform in the context of a developing country. Due to the over-arching impact of shared healthcare platforms in societal benevolence, it has become instrumental for the people of a developing country who can access medical information and facilities remotely. Moreover, the healthcare service research via shared-platform has received little attention in the academic literature though it gained acceleration in the real-life scenario during the COVID-19 pandemic. We examined how VCC influences customer value and welfare perceptions through the meaningfulness of service innovation. Several studies have adopted numerous theoretical viewpoints in the extant literature while investigating VCC, service innovation, perceived value, and quality of life. Our findings suggest VCC as a second-order construct comprising of dialogue, access, risk and transparency, which strongly explains customer perceived service innovation, perceived value and overall health welfare in the context of a shared healthcare platform in a developing country. These findings offer an insightful contribution to the extant

literature of VCC, perceived service innovation, and customer welfare, along with some guidelines for the practitioners. The findings also offer strategic and managerial implications for the health-related service industry and policymakers. It demonstrates that a sharing platform for health-related services can provide patients with access to more reliable medical facilities while specifying resources and practices needed from several stakeholders for distinct value to emerge. This is a significant finding for a developing country where it is difficult to provide health services in its resource-poor nook and corner.

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Table 1: Demographic profile of respondents

Items	Categories	%	Items	Categories	%
Gender	Male	38	Age	18-25	23
	Female	62		26-33	27
				34-41	21
Location	Urban	45		42-49	25
	Rural	55		50+	4
Income	< $ 50	43	Occupation	Working full time	21
(per month in US $)	$ 51- $100	22		Working part-time	33
	$ 101 - $200	20		Stay-at-home spouse	41
	$ 201 +	15		Others	5
Education	Primary to SSC	47			
	HSC	20			
	Bachelor	22			
	Masters+	11			

Table 2: Measurement Model: Assessment of First-Order, Reflective Model

Reflective Constructs	Items	Loadings	CR	AVE
Dialogue (DIA)	DIA1: The shared health care platform communicates with and listens to patients in order to improve its service.	0.939	0.962	0.895
	DIA2: The shared health care platform uses 24/7 channel in order to share and exchange ideas with patients about the service.	0.962		
	DIA3: The shared health care platform facilities the communication of ideas and suggestions about the service.	0.937		
Access (ACS)	ACS1: The shared health care platform allows to personalize services.	0.925	0.883	0.720
	ACS2: Patients have numerous service options in order to adapt them to their needs.	0.943		
	ACS3: It is easy to receive information from the shared health care platform anytime.	0.700		
Risk (RIS)	RIS1: The shared health care platform offers comprehensible information that allows the advantages and disadvantages of the services to be assessed.	0.777	0.834	0.627
	RIS2: The shared health care platform offers many possibilities to present complaints regarding any problems that may arise during the service.	0.830		
	RIS3: The shared health care platform repeatedly urges patients to familiarise themselves with the possible risks involved in using the services (side effects of medications…).	0.767		
Transparency (TRA)	TRA1: The shared health care platform provides transparent information in order to assess and improve the service it offers.	0.833	0.840	0.637
	TRA2: Patients have access to all the information that may be of use in improving the service.	0.785		
	TRA3: The shared health care platform offers public and transparent information regarding the prices associated with various services.	0.775		

Service Innovation (PSI)	PSI1: I think this shared healthcare platform comes up with new and practical ideas to improve health service.	0.971	0.971	0.917
	PSI2: I think this shared healthcare platform often develops new methods for healthcare delivery.	0.962		
	PSI3: I think this shared healthcare platform often uses new technologies, processes, and techniques in health services.	0.938		
Perceived Value (PVL)	PVL1: Taking into consideration the price paid and the time and effort employed in receiving the service, I consider the final result to be excellent.	0.948	0.942	0.890
	PVL2: I have received excellent value for money.	0.939		
Customer Welfare (CWL)	CWL1: The shared health care platform enabled me to improve my overall health.	0.931	0.958	0.852
	CWL2: In most ways, my life has come closer to my ideal since I started using the shared health care platform.	0.932		
	CWL3: I have been more satisfied with my health life, thanks to this shared health care platform.	0.940		
	CWL4: So far, this service of shared health care platform has helped me to achieve the level of health I most want in life.	0.887		

Table 3: Correlations and AVEs*

	DIA	ACS	TRA	RIS	PSI	PVL	CWL
DIA	**0.946**						
ACS	0.493	**0.849**					
TRA	0.530	0.423	**0.896**				
RIS	0.513	0.443	0.489	**0.798**			
PSI	0.471	0.546	0.534	0.467	**0.957**		
PVL	0.488	0.462	0.511	0.411	0.419	**0.943**	
CWL	0.532	0.481	0.480	0.471	0.435	0.409	**0.923**

**Square root of AVE on the diagonals.*

Table 4: Results of the Structural Model

Hypotheses	**Main Model**			**Path coefficients**	**Standard error**	***t*-statistic**
H1	VCC	→	PSI	0.749	0.039	18.975
H2	PSI	→	PVL	0.524	0.069	7.547
H3	VCC	→	PVL	0.261	0.069	3.758
H4	PSI	→	CWL	0.310	0.081	3.830
H5	VCC	→	CWL	0.270	0.059	4.583
H6	PVL	→	CWL	0.310	0.075	4.140

FIGURES

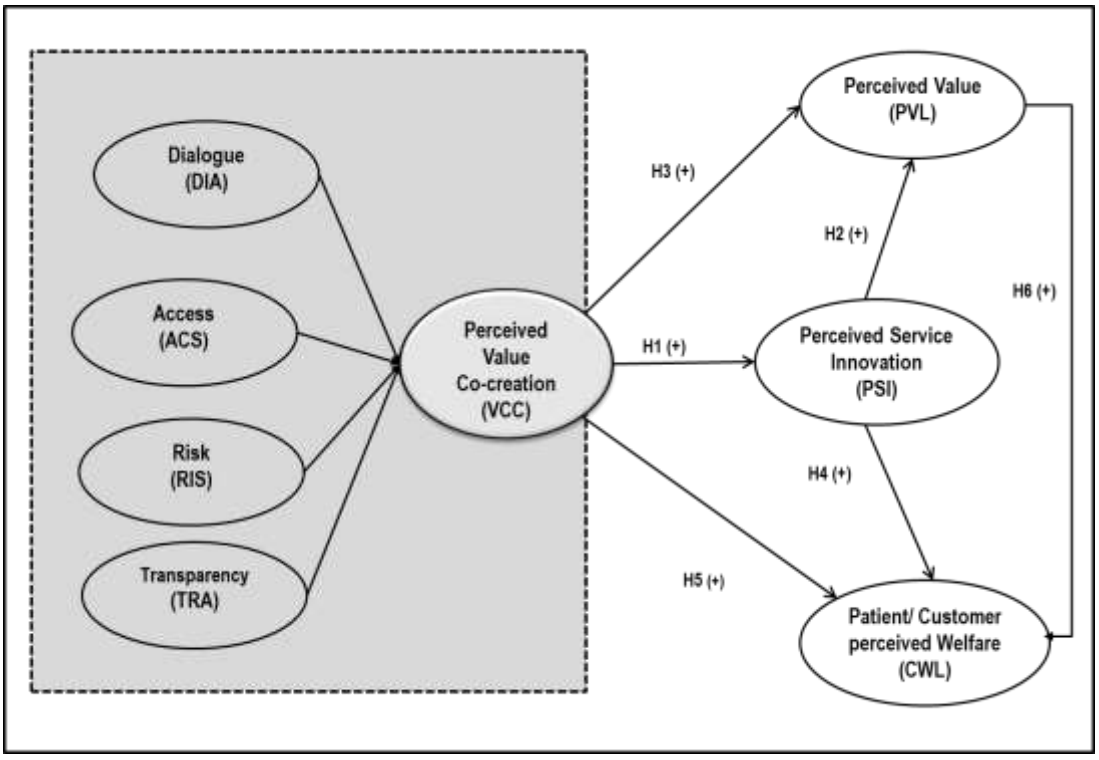

Figure1: Research Model

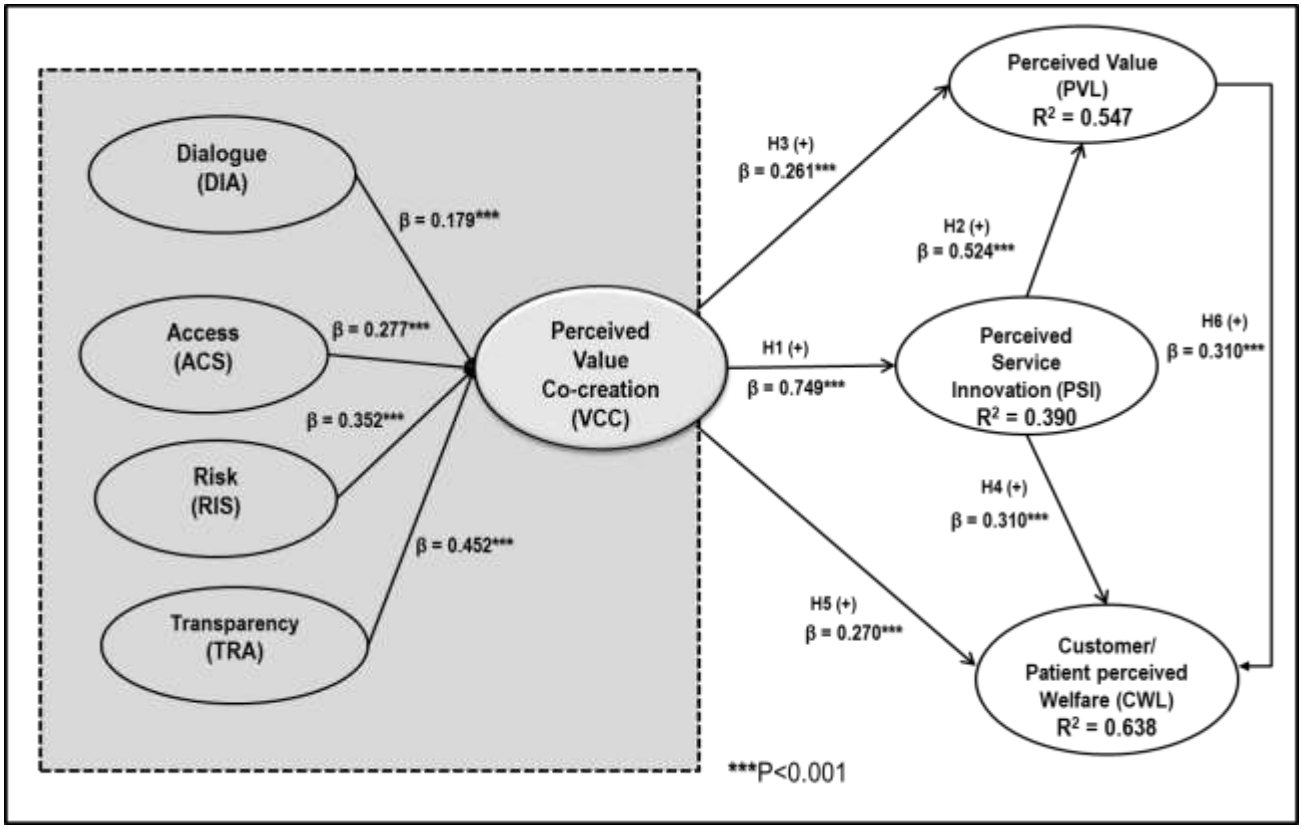

Figure 2: Structural model.