

## The Impact of Social Capital on Socioeconomic Condition of CKDu Patients in Sri Lanka: An Empirical Investigation

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### Abstract

Chronic Kidney Disease of Uncertain aetiology (CKDu) has been the cause of devastation on patients, their families and the society alike in rural Sri Lanka. CKDu patients' best hope for help lies in informal support of social mechanisms, due mainly to the absence of formal support mechanisms. Hence, this study attempted to explore how social capital affects the socio-economic condition of CKDu patients. Study mainly employed the survey method to gather data collected from 132 CKDu patients living in two villages in Rideemaliyadda. Data were collected using structural questionnaire having face-to-face interviews and analysed using Partial Least Squares-Structural Equation Modelling. Results revealed that relational social capital (RSC) plays a dominant role on the improvement of socio-economic conditions of CKDu patients. RSC has a positive significant impact on the flow of information and resources, which facilitate to improve socio-economic condition of CKDu patients. However, structural social capital (SSC) has no significant impact on the flow of information and resources, which affect the socio-economic condition of CKDu patients. Thus, this study concludes that social capitals, especially RSC has a significant impact on the flow of information and resources and thereby improve the socio-economic condition of the CKDu patients in Sri Lanka.

**Keywords:** CKDu Patients; Information; Resources; Social Capital; Socio-economic Condition.

### 1. Introduction

Chronic Kidney Disease of unknown etiology (CKDu), since its first reports in Sri Lanka in 1990s, has escalated into one of the most critical diseases affecting the country (WHO, 2016; Wimalawansa, 2013). Its socio-medical significance is at the highest in some areas where the leading cause of in-hospital deaths were caused by CKDu (Wijewickrama et al, 2019). Even though various sources forward different statistics about the affected individuals, hospitalizations and death rates, it has already become a major threat to the rural farmers in Sri Lanka. With about 24,000 km<sup>2</sup> area identified as risk areas, spanning into 11 districts and approximately 2.8 million inhabiting in the area, CKDu at its current rate is likely to inflict heavy damages to the society (Wimalawansa, 2013). Approximately 5000 deaths are recorded each year, with about 100,000 individuals are reported to be affected and 5% death rate is prevalent among the affected individuals (Wimalawansa, 2013; Wijewickrama et al, 2019). More than 20,000 deaths were reported from CKDu and the numbers are accumulating every day. Due mainly to the significant increase of deaths from CKDu and increasing prevalence of the disease, it is now considered as the most burning environment related health issue of national importance in Sri Lanka.

Many of the CKDu affected are young to middle aged males engaged in paddy farming and another agricultural commodity cultivation (WHO, 2016; Wimalawansa, 2013). The nature of CKDu makes the affected patients eventually succumb to the disease, yet with the progression of the disease comes weakness and immobility, rendering them incapable of performing day-to-day work and livelihood, and their earnings are dwindled. In addition, health care and associated costs further aggravate the financial problems of patients and families. With the head of the household affected in majority of the cases, severe socio-economic problems are faced by CKDu patients and families, hence, at present, the disease is better explained as a humanitarian tragedy with vast implications to the society and the economy alike (Bandarage,

2013). In this context, the only relief for the patients and families come from the free health services of the government hospitals. However, there are no other formal mechanisms to support CKDu patients and their families to recuperate the losses incurred and to cope up with the associated socio-economic tragedy. Yet, due mainly to the strong social relationships, these patients and families are supported in various ways by their friends, relatives, neighbours and others to maintain their living conditions. Many studies elsewhere have shown that individuals use their inter-personal relationships to acquire resources, moral help and information (Chow and Chan, 2018; Poppo and Zenger, 2002). The extent of interpersonal relationships and the qualities which help to govern relationships are referred to as Social Capital (SC). SC is proved to have significant improvements of the living condition of people (Kiboro, 2017) and considered as one of the key factors known to have implications on people's health. Accordingly, SC is recognized as a powerful asset which improves health behaviour, health condition of people, treatment compliance, income and quality of life (Cramm and Nieboer, 2011). Despite these evidences of SC's significance in health conditions, no empirical evidences are available to show the impact of SC on the treatment ability and living condition of CKDu patients in Sri Lanka. Therefore, the main objective of this research is to elucidate the impact of SC on treatment ability and living conditions of CKDu patients in Sri Lanka. In addition, this study provides data on socio-economic aspects of CKDu patients, which is the least studied area of CKDu in Sri Lanka.

### **1.1. Social Capital (SC)**

The concept of SC was introduced as “the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition” (Bourdieu, 1985) but more theoretical developments came later as “the value of relationship that have three characteristics; trustworthiness, norms, and information transfer” (Coleman, 1988). It is further developed as “features of social organization such as networks, norms and trust that facilitate coordination and corporation for mutual benefit” (Putnam, 1995). SC is the resources that generate from the pattern of relationships, value of relationships among individuals and common understand among individuals (Chow and Chan, 2018; Abban et al., 2013).

Relational aspect and structural aspect of SC are two main categories that create inter-ethnic bridging bonds among people (Gulati, 1995; Uphoff, 2000). The pattern of interconnected network relationship i.e. size and density of network is known as Structural Social Capital (SSC) and the strength and quality that govern the interconnected network relationship is known as Relational Social Capital (RSC) (Bhagavatula, 2009; Lu, 2007). SSC is the total pattern of relationships between individuals (Babaei et al, 2012). Nahapiet and Ghoshal (1998) define SSC as a “the overall pattern of connection between actors”. These network relationships are a key attribute in the SSC. Network ties are broadly categorized as social network, business network, and supportive network (Priyanath, 2017). The size of the network and the density of the network can be defined as key reflective dimensions of SSC (Bhagavatula, 2009; Babaei et al., 2012).

The RSC is the quality profile of interpersonal relationships (Antoldi, 2011). The nature of the relationships, the age of the relationship and regular interaction will be the result of mutual trust, relational norms, obligations and mutual identification. The strength of relationships such as strong ties, bonding ties, bridging ties, linking ties depend on the frequency of interaction, nature and history of relationship [18]. Also, the quality of the relationship increases with the strength of ties (Rokkan et al., 2003). Interpersonal trust in RSC is a governing factor of ones SC. Morgan and Hunt (1994) defines interpersonal trust as “one party has confidence in any exchange partner's reliability”. According to the Ganesan (1994), the interpersonal trust can be categorized as cognitive dimension (credibility) and behavioural dimension (benevolence). One of the key dimensions of the quality of relationship is relational norms - informal agreements that govern individuals' behavior in society. Relational norms refer to the informal agreements sustained by the value of future relationships (Baker et al, 2002). Relational norms develop expecting to pursue relationship in order to accrue mutual benefits (Dwyer et al., 1987).

### **1.2. Socioeconomic Conditions (SEC)**

The basic needs of people, such as food, clothing, air, housing, health, education, and sanitation, are recognized as fundamental requirements for maintaining a minimum living condition. People consume various goods and services to meet these basic needs. When people use/consume more goods and services compared to their past, it is generally accepted as an improvement of living condition. Hence,

socioeconomic conditions are widely used for evaluating living conditions of people (Gaur, 2013). A perfect definition for Socio Economic Condition of people is unavailable due to complex multi-dimensionality of the concept (Singh et al., 2017). Many researchers have defined socio-economic conditions of income, education, employment, housing conditions and assets (Gaur, 2013; Singh et al., 2017). According to Gaur (2013) “Socio-economic condition is a measure of an individual's or family’s economic and social position in relation to others, based on number of variables responsible such as income, education, occupation, family effluence, physical assets, social position, social participation, caste, muscle power, political influence, etc.”. It is generally agreed that the best representation of SEC of a person is from income, education and occupation (Aizcorbe et al., 2012).

### 1.3. Hypothesis

The study developed an integrated model synthesising both Social Capital theory and the concept of Socio-Economic Condition (SEC) to study how SC affect the SEC of the CKDu patients (see Figure 1). Two dimensions of SC; Structural Social Capital (SSC) and Relational Social Capital (RSC) act as independent variables while SEC represents dependent variable. Benefits of SSC; resources (RESO) and information (INFO) play mediate role in the model.

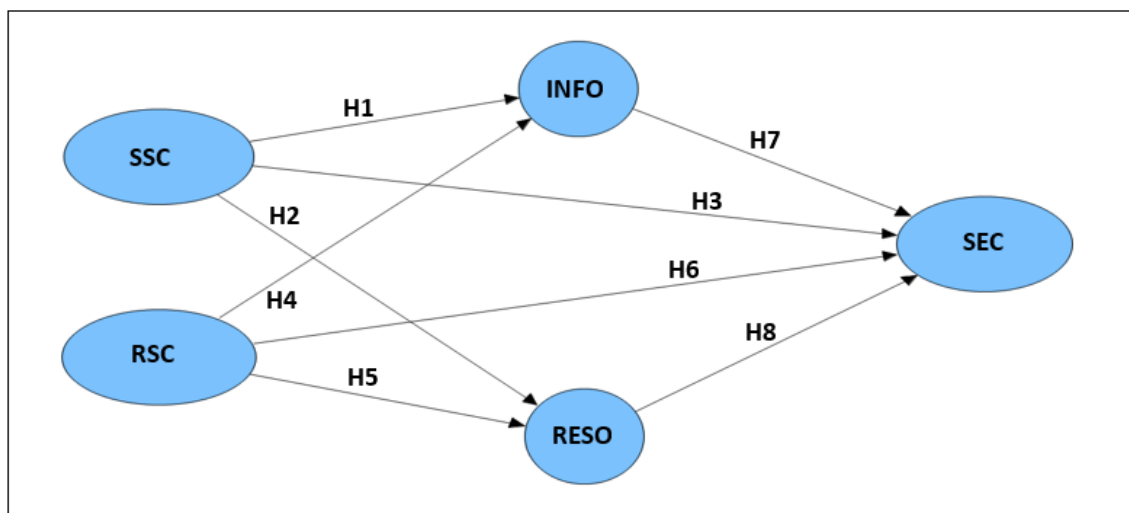


Figure 1: Conceptual model

#### 1.3.1. SSC and SEC

Patients can improve their SEC if information and resources which may help to improve treatment ability, are more easily accessible (Gulati, 1995b), hence this will be more likely for CKDu patients as well. SSC is considered to be a least cost and quick source of information and resources. It provides superior information with a minimum cost that is exchanged in need, among members of the network (Gulati, 1995b; Henningsen and Henning, 2013). Access to the information through SSC helps to reduce searching cost of information (Yenidogan, 2013). Therefore, CKDu patients can improve their SEC if they can reach sufficient information and resources. SSC play a vital role in facilitating processes of knowledge sharing and learning among network members. Thus, information gain from network helps CKDu patients to predict the future and plan the future which may affect the SEC.

CKDu patients are unable to maintain their SEC by themselves alone, they expect supports (resources and information) from network members. They usually get support from network members to gather information, resources, ideas and advice before making crucial decisions (Baker, 1990). Close members of the network lead to more positive feelings about providing supports, sharing information and resources with whom they develop a close relationship. Members of the network who have strong relationship would perceive greater social pressure for supporting and sharing their knowledge and information, because the better relationship results in high expectations of colleagues, including favourable actions (Chow and Chan, 2008). Thus, SSC has an ability to access information and get the support to improve treatment ability and SEC. Nooteboom (1993) explained that increasing the ability to spread of personal networks (size), rationality could be improved. CKDu patients can obtain ideas, opinions and experiences from network

members which may help to improve rational ability and thereby SEC. Thus, the SSC helps CKDu patients to access information and resources which leads to improve SEC. Therefore, study hypothesizes that,

H1: SSC of CKDu patient has a positive relationship with the information, which facilitate to improve SEC.

H2: SSC of CKDu patient has a positive relationship with resources, which facilitate to improve SEC.

H3: SSC of CKDu patient has positively correlated with the SEC.

### **1.3.2. RSC and SEC**

RSC reduces the searching costs and time by allowing more open and honest sharing of information for continuing relationship. Also, high level of interpersonal trust facilitates the development of common understanding among network members and facilitates to support each other in a cooperative manner (Zaheer, 1998). Long term close relationship between two members has the ability to generate interpersonal trust (Jap and Ganesan 2000). If interpersonal trust is high among members then each member will behave in good faith which affects the improvement of SEC, minimizing opportunistic behaviour (Uzzi, 1997). Interpersonal trust plays a key role in the willingness of network members to share information and resources (Inkpen and Tsang, 2005). Exchange of useful information helps parties to coordinate their activities (Anderson and Weitz, 1992). Exchange parties become more satisfied with each other when they share information and resources (Mohr et al., 1994). Information sharing enables channel partners to coordinate their activities better (Doucette, 1996). The norm of solidarity refers to the type of behaviour where network members are supportive and cooperative towards each other. When network members realize they have common interests, they develop a team spirit that leads them to consider each other's success as their own. This encourages them to behave cooperative manner (Doucette, 1996; Heide and John, 1992). Thus, it can be summarized that CKDu patients expect reliable information, knowledge and moral supports from network members and expect support to maintain their normal life which affect the improvement of SEC. Therefore, the study hypothesizes that,

H4: RSC of CKDu patient has a positive relationship with the information which facilitate to improve SEC.

H5: RSC of CKDu patient has a positive relationship with resources which facilitate to improve SEC.

H6: RSC of CKDu patient has positively correlated with the SEC.

### **1.4. Benefits of SC and SEC**

Major benefits of SC are the exchange of knowledge and information, lowering uncertainty and opportunism and enhancing moral support dependent on the level of trust among network members (Macerinskiene and Aleknaviciute, 2011). SC also improves economic capabilities by sharing information and resources (Uzzi, 1997; Adler and Kwon, 2002). Another benefit of SC is the exchange of resources which improve economic capabilities between parties (Bueno et al., 2004). SC is valuable to households in its own right or uses in combination with other categories of capital to maintain and improve livelihoods (Minamoto, 2010). Collier (1998) has investigated the concept of SC from an economic perspective and suggested that SC is economically beneficial because social interaction generates positive externalities. It facilitates recognition of the behaviour of others and this reduces the problem of opportunism.

Scholars highlighted that SC has a considerable potential for health improvement, particularly for the most disadvantaged groups in society (Gele and Harslof, 2010). SC provides information for the prevention of mental and physical illness, as well as for the promotion and restoration of general health (Golden et al., 2009). SC improves health conditions (Barefoot et al., 2005) and health-related measures of the quality of life (Drageset et al., 2009), spread happiness and improve the health of people with chronic diseases. Thus, the literature suggests that SC has an influence on improve health conditions and SEC of patients. Therefore, strength of SC particularly of CKDu patients in Sri Lanka, facilitates to share importance knowledge and information and resources which may help to improve the SEC. Therefore, the study hypothesizes that;

H7: Information received from SC positively connect with the SEC of CKDu patient.

H8: Resources received from SC positively connect with the SEC of CKDu patient.



## 2. Materials and Methods

The study employed a quantitative approach to study the research problem and selected a survey method to gather data. Two villages situated in Redimaliyadda Divisional Secretariat Division located in Uva province in Sri Lanka, where a large number of farmers who suffered from CKDu lived, was selected. According to the Medical Officer of Health (MOH) of Mahiyangana, there were 132 farmers who suffered from CKDu living in these two villages and data were collected from all these patients. Structural questionnaire was used to gather data from patients. The questionnaire was developed carefully applying a two-step procedure. Initially, a pool of questionnaire items to represent each variable was established, reviewing empirical literature and selected items which were more relevant to measuring each particular variable. Then, a pilot survey was conducted in order to verify whether instructions were clear, questions were understood, and whether the order of the questions was suitable. Data were gathered for the questionnaire having face to face interviews with CKDu patients

The study assessed SSC using network size and network density (Bhagavatula, 2009; Priyanath, 2017; Premaratne, 2002). Network density was measured as a percentage of close relationships within the total number of possible relationships. Network size was calculated by number of close relationships in different categories of network which included into two categories: first, social networks are formed by family, relations, friends and neighbours; second, supportive networks comprise buyers and suppliers, acquaintances, members of agricultural and other societies, politicians, religion leaders, teachers etc. (Babaei et al, 2012). Evaluating the network size and network density in ratio scale was done by inquiring each respondent to estimate the numbers of persons, he/she has closed connection and the percentage of close connection out of the potential connections.

RSC refers to the strength of relationships that CKDu patient has developed with each other and quality of relationship including inter-personal trust and relational norms embedded with the relationships. The strength of relationship is measured using Network Strength Index which was developed by Lu and his research team (Babaei et al, 2012). Inter-personal trust refers to the belief of patient that the network member is creditable (honest, flexible, fair and in no circumstance will purposely do anything to damage the relationship) (Ganesan, 1994; Zaheer et al., 1998). The study defined relational norms as the expectations about the behaviour that are at least partially shared informal agreements between parties that have been shown to govern their relationships. Relational norms between patient and network members were measured using three variables; information exchange, flexibility and solidarity, based on established protocols (Anderson and Weitz, 1992; Heide and John, 1992; Adler and Kwon, 2002; Dyer and Chu, 2003). Each item was measured at an ordinal level with 7-point Likert scales (1 – Strongly disagree; 2 – Disagree; 3 – Somewhat disagree; 4 – Neither agree nor disagree; 5 – Somewhat agree; 6 – Agree; 7 – Strongly agree). Each respondent was asked to state his/her agreement to the statements using these rankings.

Information that helps to improve treatment ability was assessed using the ability of access to information about disease, symptoms, protecting measures, reliability of medical tests, dugs, doctors etc. Resources helping to improve treatment ability was measured based on the financial ability to travel hospital/clinic/medical centres, to pay helpers, to spend for private medical testing and necessary drugs etc. SEC was measured using family income, housing condition, sanitation, fixed assets which were adopted by Gaur (2013). Items were measured using interval and ratio scales.

Partial Least Square - Structural Equation Modelling (PLS-SEM) was used to analyse the data and to test proposed relationships. Under this, measurement model was evaluated using validity and reliability tests and structural model was evaluated by assessing multi-collinearity, path coefficients, R<sup>2</sup>, predictive relevance (Q<sup>2</sup>), and effect size (f<sup>2</sup>). SmartPLS (version 2) software was used to analyse data.

## 3. Results and Discussion

The relationship between network structure and living condition of CKDu patients was evaluated using a two-step approach on four steps hierarchal basis. First, the measurement model (outer-model) was assessed examining the reliability and validity of the measurement items of constructs. Second, the structural model (inner-model) was assessed to test hypothetical relationships. The study developed first order endogenous latent variables for six questionnaire items of relational norms (i.e. flexibility, solidarity and reciprocity). The constructs were developed and assessed using the standardised factor loadings and t-statistics. Variables

were measured using the perception of CKDu patients about three members of social network and three members of supportive network.

Indicator reliability of first order reflective constructs is confirmed showing that the standardised factor loadings were above the minimum threshold criterion 0.7. It further shows that all the factor loadings were statistically significant at 0.05 significance level ( $t$  statistics  $> 1.96$ ). Hence, the results show a strong evidence for indicator reliability of the first order constructs. Both Cronbach's alpha ( $\alpha$ ) and composite reliability were greater than the required value of 0.7 confirming the convergent validity of the first order constructs. Average Variance of Extract (AVE) for each construct was higher than the required value 0.5 indicating that each construct has the capability to explain more than half of the variance to its measuring items on average. On discriminant validity, none of the inter-construct correlation values were above the square-root of the AVE and satisfied the criterion of the discriminant validity of first order constructs.

The second-order constructs for five questionnaire items to reflect the interpersonal trust and three items for relational norms were developed using latent variable scores of the first-order constructs. The study has developed three constructs (interpersonal trust, relational norms, strength of ties) at the third order level with the help of latent variable scores of second order constructs. All path coefficients (standardised factor loadings) were well above the threshold value 0.7. The bootstrapping procedure was conducted to estimate the significance of each path coefficient by examining the  $t$ -statistics. All the  $t$ -statistics were significant at 0.05 significance level. Hence, the results provided the strong evidence for indicator reliability of the second order constructs. Cronbach's alpha and composite reliability were greater than the recommended 0.7 value, showing high reliability of second order constructs. AVE for each construct was higher than the required value 0.5. These results confirmed the convergent validity of the second order construct. The discriminant validity was examined using Fornell and Larcker [54] criterion and it shows that no inter-construct correlation value was above the square root of the AVE. Therefore, the discriminant validity was accepted for second order constructs.

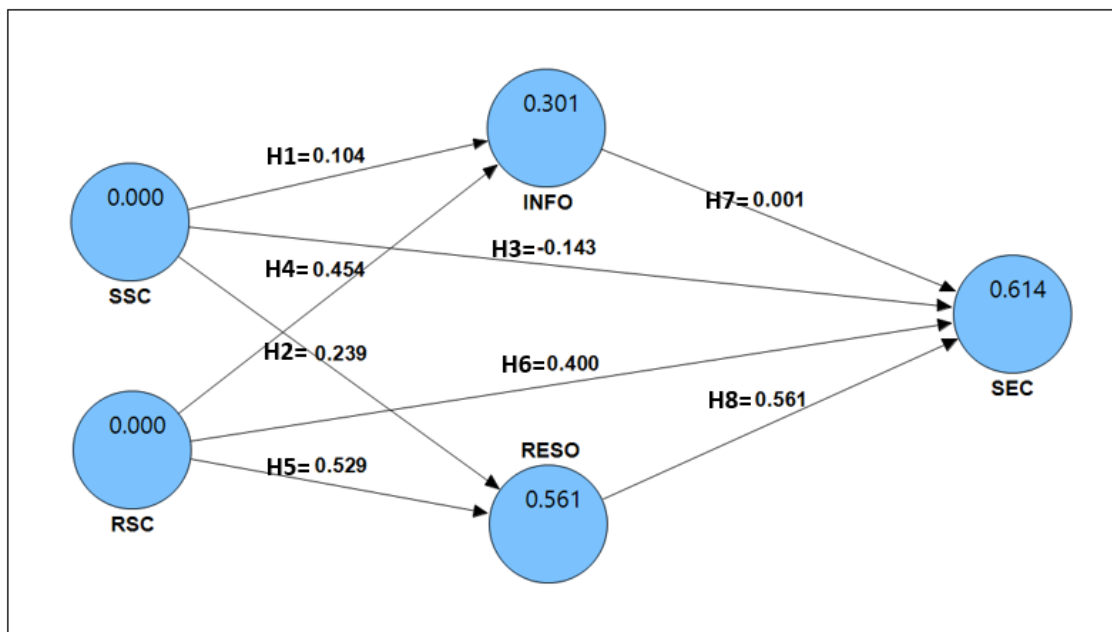
The indicator reliability and convergent validity of third order reflective constructs for three constructs i.e. interpersonal trust, relational norms and strength of ties. For all the constructs, standardised factor loadings were greater than 0.7 and factors loadings were significant at 0.05 significance level showing a greater indicator reliability. Furthermore, the Cronbach's alpha was higher than the required value of 0.7 and composite reliability was greater than the recommended 0.7 value for all the constructs. AVE for each construct was higher than the required value 0.5 indicating the convergent validity of the third order constructs. The results further indicate that the square root of AVE was greater than all the correlations of the constructs confirming that the discriminant validity of all the third order constructs.

Based on the third order latent variable scores, fourth order constructs for structural and relational capital, ability to access resources and information, treatment ability and living condition improvement were developed. For all the constructs, standardised factor loadings were above the minimum threshold criterion 0.7. All the factors loadings were statistically significant at 0.05 significance level. Hence, the results provide sufficient evidence to confirm the indicator reliability of the measurements. Cronbach's alpha of the fourth order constructs was greater than the required value of 0.5 and the composite reliability was higher than the recommended 0.5 value. In addition, the convergent validity of constructs is sufficient and indicate that each construct has a capability to explain more than half of the variance to its measuring items. The discriminant validity was examined using Fornell and Larcker [54] criterion and it shows that no inter-construct correlation value was above the square root of the AVE. Therefore, the discriminant validity of constructs exists.

The second step of the PLS-SEM analysing, is testing the theorized causation of the structural model as suggested by Hair and his colleagues. Structural model primarily assesses hypothesized causal relationship between exogenous and endogenous latent variables. In order to evaluate structural model, as the first step, study calculated VIF and tolerance values using SPSS to test multi-collinearity issues and further suggests that VIF above 5.00 and tolerance levels below 0.20 in the predictor constructs implies high collinearity [55]. VIF values for all path show minimal collinearity, ranging from 1.441 to 4.852. These values are significantly less than the recommended threshold value of 5.00. The tolerance levels range from 0.206 to

0.694 exceeding 0.20. This indicates an absence of multi-collinearity between the independent constructs and the dependent constructs in the structural model.

In the second step of assessing inner model, significance of the path coefficients (hypothetical relations) is estimated to decide the effect of independent variable (SC) on the dependent variable (SEC). Each path relationship presents the regression coefficient ( $\beta$ ). T-statistics, obtained using PLS Bootstrap process, was used to evaluate the significance of the path coefficient ( $\beta$ ). Figure 2 shows the graphical representation of the paths coefficients. Considering both the paths coefficients and t-statistics, 07 out of 09 hypothetical relationships were significant. Given that, the results of the paths towards the SECC revealed that the both SSC and RSC were significant at 1 percent ( $p < 0.01$ ).



**Figure 2: Path diagram**

In this model, explanatory power of dependent variables i.e. information, resources, and SEC was reported as 0.301, 0.561, and 0.614 respectively. Usually, higher the value of R2 better the model fits with the observations. However, based on the results 61% of the variation of treatment ability can be explained by the independent variables.

Assessment of the coefficient of the determination (R2): Figure 02 indicates that the SEC had the highest variance ( $R^2 = 0.614$  or 61.4 percent) followed by resources ( $R^2 = 0.561$  or 56.1 percent), and information ( $R^2 = 0.301$  or 30.1 percent). Following the criterion of Chin [56], present model is considered to be moderately fit because explanatory power (R2 value) of one variable was moderate and one variable was weak. One out of three relations presents small effect size of predictive variables ( $f^2$  is 0.02 and above) while the rest two shows large effect size. Predictive relevance (Q2) of the SEC was 0.518 and Resources was 0.431 displaying a substantial higher explanatory power. Q2 of Information was weak (0.175).

Table 01 shows that though the SSC had a positive direct impact on information of CKDu patients ( $\beta = 0.104$ ), the relationship was not significant ( $t$ -value = 0.85). Thus, hypothetical relationships of H1 is not supported by the empirical results. SSC has a significant positive direct impact on resources which helps to improve SEC of CKDu patients ( $\beta = 0.239$  or 23.9 percent and  $t$ -value = 1.91). Thus, hypothetical relationships of H2 is supported by the empirical results. Similar results are provided by some studies. Gele and Harslof (2010) explained that networks provide instrumental support (financial and material aids or assistance) for patients. Cramm and Nieboer (2011) highlighted that SSC is an important resource for community health promotion. However, the results indicate that SSC is associated with SEC and has not shown a significant influence on SEC ( $\beta = -1.43$  and  $t$ -value = 1.01). The results do not support the hypothesis H3. In this study, SSC was measured using two main components, social network and supportive network. Supportive network consists with many members such as medical doctors, religious leaders, politicians, government officers etc. However, number of relationships CKDU patients have with these in

the studied area was very small, leading to very limited impact on the socio-economic condition of the affected. A large number of studies (Baker, 1990; Burt, 2000; Donnell, 2004; Ting et al., 2007) empirically confirmed that SSC plays an important role in sharing information. Okten and Osili (2004) and Ting et al. (2007) explained that network size helps to tap information in external environment successfully and reduce information asymmetry. However, our results do not verify these findings. Accordingly, our study proves that the CKDu related information do not reach the patients at sufficient level. As these are health related information, they may not have sufficient knowledge on the disease and related information. Hence, SSC may not have a reasonable knowledge pertaining to CKDu to share, leading to have no positive significant relationship with information

**Table 1: Path Coefficients and Significant**

Hypothesis	Relationship	$\beta$	t-statistics	Result
H1	SSC → INFO	0.104	0.85	Not supported
H2	SSC → RESO	0.239	1.91*	Supported
H3	SSC → SEC	-0.143	1.01	Not supported
H4	RSC → INFO	0.454	3.96**	Supported
H5	RSC → RESO	0.529	4.41**	Supported
H6	RSC → SEC	0.400	3.24**	Supported
H7	INFO → SEC	0.009	0.01	Not supported
H8	RESO → SEC	0.561	5.97**	Supported

\*p<0.05, \*\*p<0.01.

(n=132).

Source: Survey data, 2018

Table 1 further shows that RSC has a powerful impact on the improvement of information by 45.4 percent ( $\beta = 0.454$ ), the regression coefficient was positively significant (t-value = 3.04). Thus, hypothesis, H4 is strongly proved by empirical data. Many scholars (Chow and Chan, 2008; Lu, 2007; Uzzi, 1997) have confirmed that RSC is the source of complex knowledge and information. These ideas are further verified by the empirical results of this study. The regression results showed that the relationship between SSC and resources had significant positive regression coefficient ( $\beta = 0.529$  or 52.9 percent and t-value = 4.41) supporting the hypothesis, H5. RSC showed a significant positive direct impact on SEC of CKDu patients ( $\beta = 0.400$  or 40 percent and t-value = 3.24) confirming that the RSC of CKDu patients has a powerful positive effect on SEC. Thus, hypothetical relationship H6 is supported by the empirical results.

Results of the present study indicate that the information related to CKDu has no significant relationship with the socio-economic condition of CKDu patients ( $\beta = 0.009$  and t-value = 0.01; H7 is not accepted). Accordingly, health related information that supports the socio-economic condition of the patients appear to be flowing insignificantly. This however may be a limitation coming from the data collection instrumentation, where there was no data collection on socio-economically important medical information flow. According to the results, resources have a significant positive relationship with socio-economic condition of the CKDu patients ( $\beta = 0.561$  and t-value = 5.97; H8 is accepted). As explained in theoretical base above, social capital generates two benefits; information and resources. Resources are significantly contributing to the SEC of the CKDu patients (Andrew et al., 2009). Resource sharing such as transportation, financial supports, shared workforce directly benefiting the SEC of the affected families, leading to a significant positive relationship observed in this study.

## 5. Conclusions

Present study reveals that RSC has a powerful impact on the SEC of CKDu patients in the studied area, by providing resources and information to the affected patients and families. However, SSC has a less impact in



this regard due mainly to the existence of weak relationships with supportive networks. External information flowing from weak supportive networks are therefore not effectively penetrating / conveyed to the patients. Therefore, existing access of information through SSC are not strongly influencing SEC of CKDu patients. Hence, the study highly recommends that a mechanism need to be developed to strengthen SSC, in particular, informal and formal supportive networks in order to facilitate a better sharing of CKDu related medical information. Further, such a strengthened SSC can be effectively used to provide direct external support to the SEC of the affected patients and families.

This study made several contributions to the knowledge of social capital which leads to share fine tune information and SEC of CKDu patients in Sri Lanka. The paper extends the familiarity with the importance of SC of CKDu patients and contribute to fill the gap in existing literature through empirical evidence. Many scholars explore the effect of SC as an important tool which affects the SEC. However, in the Sri Lankan context, lack of indications reflects about the effect of SC of CKDu on SEC. The study fills this gap by disclosing empirical evidence providing substantial contributions to empirical knowledge in the fields of social capital and CKDu. The most important contribution of this study was that it reveals the strength of social capital of CKDu patients on the improvement of SEC.

This study undergoes several limitations that should be addressed by future researchers. First though, several dimensions of SC have been addressed by scholars in the literature, present study only addressed two dimensions of SC. On the other hand, the foremost limitation is the number of participants in our sample (n= 132), that it examines a very small subset of the total population. Though two villages in Redimaliyadda Divisional Secretariat Division located in Uva province in Sri Lanka, is a small area, there are many other areas which record CKDu patients in Sri Lanka. Therefore, further studies are needed to represent all the areas with a large sample.

#### **Funding:**

This work was supported by the Sabaragamuwa University of Sri Lanka under the Grant No. SUSL-RG-2017-02

**Acknowledgments:** The authors would like to acknowledge Ayurvedic Medical Officer Ms. P. W. Gunasekara for her assistance with finding CKDu patients' information as well as Local Government Commissioner, Mr. M. M. Wijenayake and Assistant Commissioner of Agrarian Services for their assistance with providing necessary official facilities for data collection. In addition, the authors are thankful for the time and knowledge shared by the patients who participated in this study.

**Conflicts of Interest:** The authors declare no conflict of interest.

#### **References**

- [1.] Abban, R., Omta, S.W.F., Aheto, J. B. K. and Scholten, V.E. (2013). Connecting the dots: a multiple case study of the network relationships of small and medium-sized enterprises (SMEs) in the non-traditional agricultural export (NTAE) sector of Ghana. *African Journal of Economic and Management Studies*, 4(1), 74-94.
- [2.] Adler, P. S. and Kwon, S. W. (2002). Social capital: prospects for a new concept. *The Academy of Management Review*, 27(1), 17-40.
- [3.] Aizcorbe A., Liebman E., Pack S., Cutler D. M., Chernew M. E., and Rosen A. B. (2012). Measuring Health Care Costs of Individuals with Employer-Sponsored Health Insurance in the US: A Comparison of Survey and Claims Data. *Statistical Journal of the International Association for Official Statistics* 28 (1), 43–51.
- [4.] Anderson, E. and Weitz, B. (1992). The use of pledges to build and sustain commitment in distribution channels, *Journal of Marketing Research*, 29(1), 18-34.
- [5.] Andrew, M. Chisholm and Klaus, N. (2009). Social capital and the resource-based view of the firm, *International Studies of Management & Organization*, 39 (2), 7-32, DOI: 10.2753/IMO0020-8825390201.
- [6.] Antoldi, F. (2011). Strategic networks, trust and the competitive advantage of SMEs. *Export Consortia in Developing Countries*, Berlin Heidelberg: Springer.

- [7.] Babaei, H., Ahmad, N. and Gill, S. S. (2012). Bonding, bridging and linking social capital and empowerment among squatter settlements in Teheran, Iran. *World Applied Sciences Journal*, 17(1), 119-126
- [8.] Baker, G., Gibbons, R. and Murphy, K. J. (2002). Relational contracts and the theory of the firm. *Quarterly Journal of Economics*, 117(1), 39-84.
- [9.] Baker, W. E. (1990). Market networks and corporate behavior. *American Journal of Sociology*, 96(3), 589-625.
- [10.] Bandarage, A. (2013). Political economy of epidemic kidney disease in Sri Lanka, *SAGE Open*, 3(4), 1-13. <https://doi.org/10.1177/2158244013511827>.
- [11.] Barefoot JC, Gronbaek M, Jensen G, Schnohr P, Prescott E, (2005). Social network diversity and risks of ischemic heart disease and total mortality: findings from the Copenhagen City Heart Study. *American Journal of Epidemiology*, 161(10):960-7.
- [12.] Bhagavatula, S. (2009). Weaving social networks performance of small rural firms in India as an outcome of entrepreneurs' social and human capital. PhD Dissertation, Visakhapatnam University, India.
- [13.] Bourdieu, P. (1985). The Forms of Capital. In J. G. Richardson (Eds.), *Handbook of Theory and Research for the Sociology of Education*, (pp. 46 – 58), New York: Greenwood Press.
- [14.] Bueno, E., Salmador, M. O., and Rodriguez, O. (2004). The Role of Social Capital in Today's Economy: Empirical Evidence and Proposal of a New Model of Intellectual Capital, *Journal of Intellectual Capital*, 5(4): 556–574. doi:10.1108/14691930410567013
- [15.] Burt, R. S. (2000). The network structure of social capital. *Research in Organizational Behaviour*, 22(5), 345-423.
- [16.] Chin, W.W., 1998. Commentary: Issues and opinion on structural equation modeling.
- [17.] Chow, W. S. and Chan, L. S. (2008). Social network, social trust and shared goals in organizational knowledge sharing. *Information & Management*, 45(7), 458-465.
- [18.] Coleman, J.S. (1988). Social capital in the creation of human capital. *The American Journal of Sociology*, 94(12), 95-120.
- [19.] Collier, P. (1998). Social capital and poverty, Working Paper No. 4, Sustainable Development Network, The World Bank. Retrieved at <http://www.worldbank.org/socialdevelopment>,
- [20.] Cramm, J.M. and Nieboer, A.P., 2011. The influence of social capital and socio-economic conditions on self-rated health among residents of an economically and health-deprived South African township. *International Journal for Equity in Health*, 10(1), p.51.
- [21.] Donnell, A. O. (2004). The nature of networking in small firms. *Qualitative Market Research: An International Journal*, 7(3), 206-217.
- [22.] Doucette, W. R. (1996). The influence of relational norms and trust on customer satisfaction in inter firm exchange relationship. *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behaviour*, 9(5), 95-103.
- [23.] Drageset, J., Eide, G.E., Nygaard, H.A., Nortvedt, B.M. and Natvig, G.K. (2009), The impact of social support and sense of coherence on health-related quality of life among nursing home residents—a questionnaire survey in Bergen, Norway. *International Journal of Nursing Studies*, 46(1), 65-75.
- [24.] Dwyer, F. R. Paul, H. and Oh, S. S. (1987). Developing buyer-seller relationships. *The Journal of Marketing*, 51(2), 11-27.
- [25.] Dyer, J. H. and Chu, W. J. (2003). The role of trustworthiness in reducing transaction costs and improving performance: empirical evidence from the United States, Japan, and Korea. *Organization Science*, 14(1), 57-68.
- [26.] Eller, M., Holle, R., Landgraf, R. and Mielck, A. (2008). Social network effect on self-rated health in type 2 diabetic patients—results from a longitudinal population-based study. *International Journal of Public Health*, 53(4), 188-94.
- [27.] Fornell, C. and Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(1), 39-50.
- [28.] Ganesan, S. (1994). Determinants of long-term orientation in buyer-seller relationships, *Journal of Marketing*, 58(2), 1-19.

- [29.] Gaur, K. L. (2013). Socio-economic status measurement scale: Thirst area with changing concept for socio-economic status, *International Journal of Innovative Research & Development*, 2(9). 139 - 145.
- [30.] Gele, A.A. and Harslof, I. (2010). Types of social capital resources and self-rated health among the Norwegian adult population, *International Journal for Equity in Health*, <https://doi.org/10.1186/1475-9276-9-8>.
- [31.] Golden J, Conroy RM, Lawlor BA (2009) Social support network structure in older people: underlying dimensions and association with psychological and physical health. *Psychological Health Medicine*, 14(3):280-90.
- [32.] Gulati, R. (1995a). Does Familiarity Breed Trust? The Implications of Repeated Ties for Contractual Choices in Alliances. *Academy of Management Journal*, 38(8), 85-112.
- [33.] Gulati, R. (1995b). Social Structure and Alliance Formation Patterns: A Longitudinal Analysis. *Administrative Science Quarterly*, 40(6), 619-652.
- [34.] Hair, J. F., Hult, G. T. M., Ringle, C.M. and Sarstedt, M. (2014). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. New York: Sage publication.
- [35.] Heide, J.B. and John, G., 1992. Do norms matter in marketing relationships?. *Journal of marketing*, 56(2), pp.32-44.
- [36.] Henningsen, G. A. and Henning, C. H. C. A. (2013). Networks and transaction costs. *American Journal of Agricultural Economics*, 94(2), 377-385.
- [37.] Inkpen, A.C. and Tsang, E.W., 2005. Social capital, networks, and knowledge transfer. *Academy of management review*, 30(1), pp.146-165.
- [38.] Jap, S. D. and Ganesan, S. (2000). Control mechanisms and the relationship life cycle: Implications for safeguarding specific investments and developing commitment. *Journal of marketing research*, 37(2), 227-245.
- [39.] Kiboro, C. N. (2017). Influence of social capital on livelihood outcomes for the internally displaced persons in Kenya: a social capital approach, *European Scientific Journal*, 13(26), 266 - 280. DOI: <http://dx.doi.org/10.19044/esj.2017.v13n26p266>.
- [40.] Lu, H. (2007). The role of guanxi in buyer-seller relationships in China, PhD thesis, Wageningen University, China.
- [41.] Macerinskiene, I. and Aleknaviciute, G. (2011). The evaluation of social capital benefits: enterprise level, *Business, Management and Education*, 9(1): 109 –126, doi:10.3846/bme.2011.08
- [42.] Minamoto, Y. (2010). Social capital and livelihood recovery: post-tsunami Sri Lanka as a case, *Disaster Prevention and Management: An International Journal*, 19(5), pp. 548 – 564.
- [43.] Mohr, J. J., Fisher, R. J. and Nevin, J. R. (1996). Collaborative Communication in Inter- firm Relationships: Moderating Effects of Integration and Control. *Journal of Marketing*, 60(2), 103-115.
- [44.] Morgan, R. M. and Hunt, S. D. (1994). The commitment trust theory of relationship marketing. *Journal of Marketing*, 58(2), 20-38.
- [45.] Nahapiet, J. and Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23(2), 242-266.
- [46.] Nooteboom, B. (1993). Firm size effect on transaction cost, *Small Business Economics*, 5, 283-295.
- [47.] Okten, G. and Osili, U. O. (2004). Social networks and credit access in Indonesia. *World Development*, 37(2), 1225-1246.
- [48.] Poppo, L. and Zenger, T. (2002). Do formal contracts and relational governance function as substitutes or complements? *Strategic Management Journal*, 23(2), 707-725.
- [49.] Premaratne, S. P. (2002). *Entrepreneurial Networks and Small Business Development, The Case of Sri Lanka*, PhD Dissertation, Eindhoven University of Technology, Eindhoven, The Netherlands.
- [50.] Priyanath H. M. S. (2017). Effect of network structure on transaction cost of small enterprises in Sri Lanka: An empirical study. *Journal of Small Business and Entrepreneurship Development*, 5(1), 1-10. DOI: 10.15640/jsbed.v5n1a3.
- [51.] Putnam, R.D., 1995. Tuning in, tuning out: The strange disappearance of social capital in America. *PS: Political science & politics*, 28(4), pp.664-683.

- [52.] Rokkan, A.I., Heide, J. B. and Wathne, K. H. (2003). Specific investments in marketing relationships: expropriation and bonding effects. *Journal of Marketing*, 40(2), 210-224.
- [53.] Singh, T., Sharma, S. and Nagesh, S. (2017). Socio-economic status scales updated for 2017, *International Journal of Research in Medical Sciences*, 5(7), DOI: <http://dx.doi.org/10.18203/2320-6012.ijrms20173029>
- [54.] Ting, S. H., Chen, C. N. and Bartholomew, D. E. (2007). An integrated study of entrepreneurs' opportunism. *Journal of Business & Industrial Marketing*, 22(5), 322-335.
- [55.] Uphoff, N. (2000). Understanding social capital: learning from the analysis and experience of participation. *Institutional Analysis*, 215-249
- [56.] Uzzi, B. (1997). Social structure and competition in inter-firm networks: the paradox of embeddedness administrative. *Science Quarterly*, 42(3), 35-67.
- [57.] Wijewickrama, E. S., Gunawardena, N., Saroj Jayasinghe, S., and Herath, H. (2019). CKD of unknown etiology (CKDu) in Sri Lanka: a multilevel clinical case definition for surveillance and epidemiological studies, *Kidney International Reports*, 1 -6.
- [58.] Wimalawansa, S.J. (2013). Water pollution-associated ill health: special emphasis on chronic kidney disease in Sri Lanka. Retrieved from <https://wimalawansa.org/sites/all/files/Olcott-Oration.pdf>.
- [59.] World Health Organization [WHO], (2016). Report of the international expert consultation on chronic kidney disease of unknown etiology (CKDu) in Sri Lanka. Country office, Sri Lanka.
- [60.] Yenidogan, T. G. (2013). The impacts of transaction attributes and trust on ex-post opportunism. *International Journal of Management Sciences and Business Research*, 2(6), 39-44.
- [61.] Zaheer, A., McEvily, B. and Perrone, V. (1998). Does trust matter? Exploring the effects of Inter-organizational and inter-personal trust on performance. *Organization Science*, 9(2), 141-159.