University of Twente

Health Related Quality of Life, Character Strengths and The Role of Coping Style in patients With Chronic Kidney Disease Stage four and five in Aruba.

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Author:
Vandana Geerman

Student Number:
S1860089

(25 ECs)

Supervisors:
First internal supervisor: Dr. C. Bode
University of Twente (Department of Psychology, Health & Technology)

Second internal supervisor: Dr. M. Pieterse
University of Twente (Department of Psychology, Health & Technology)

External supervisor: **Dr. Z. Choudhry**
Dr. Horacio E Oduber Hospital Aruba (Internist-Nephrologist)

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Abstract

Background: Chronic Kidney Disease is a well-known health problem that challenges the Health Related Quality of Life for people in Aruba. Strengths and Coping styles have been identified as predictors of Health Related Quality of life. However, no research was found assessing Health Related Quality of Life, Character Strengths and the role of Coping styles in patients with Chronic Kidney Disease. Therefore, this research aims to a) Investigate the Health Related Quality of Life in patients living with Chronic Kidney Disease stages four and five; (b) Examine the association between character strengths and Health Related Quality of Life; (c) Assess patients coping styles in CKD stages four and five and lastly and (d) analyze whether Coping styles" mediate or moderate the relationship between Character Strengths and Health Related Quality of Life.

Method: A total of 89 males and females with Chronic Kidney Disease stages 4 and 5 participated in this study. The SF-36 was used to assess Health Related Quality of Life, Character Strengths Rating Form was used to assess Character Strengths and The Brief COPE was used to assess coping styles. Furthermore, the PROCESS macro was used to analyze coping styles for mediation/moderation effect in the relationship between Character Strengths and Health related Quality of Life.

Results: Patient's mean score on Health Related Quality of Life was considered average μ = 60.3. The Character Strength that best described patients was Transcendence. Patients irrespective of gender and stage of illness used more Active Coping styles compared to Passive Coping styles. Low levels of Active and medium/high levels of Passive Coping styles partially moderated the relationship between Character Strengths and three Health related Quality of life subscales.

Conclusion: HRQoL in Patients with CKD stage 4 and 5 in Aruba is considered average compared to other countries. Transcendence is the Character strength that best described the patients in this sample. Active coping styles are predominantly used to cope with illness. While HRQoL, Coping styles and Character Strengths may have singular roles in contributing to a good Health related Quality of life, both active and passive coping styles can compensate for the deficient impact of Character Strengths on Health Related Quality of Life.

Acknowledgement

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Table of Contents

Introduction

Chronic illnesses are well-known health problems with increasing burden for the people in the Caribbean region (Ferguson et al., 2011). Aruba's census data show that 31.8% of its population suffered from at least one chronic health condition. Also, one-third of its population older than 65 years are expected to continue living in poor health (Health Monitor, 2013). Chronic Kidney Disease (CKD) for example, is a form of chronic illness that affects approximately 10% of the world's adult population and is a major risk factor for developing cardiovascular disease (CVD) (Hill et al., 2016). CVD, in turn, is one of the leading causes of mortality worldwide (WHO, 2018). There is a total of five stages of Chronic kidney disease. Stage one: evidence of kidney disease with normal kidney function; stage two: kidney damage with mild to moderate loss of kidney function; stage three A: kidney damage with mild to moderate loss of kidney function; stage three B: kidney damage with moderate to severe loss of kidney function; stage four: severe loss of kidney function and stage five (end-stage renal disease): kidney failure and need for dialysis or transplant (Frensenius Kidney Care, 2018). Morbidity and mortality rates increase with the progression of Chronic Kidney Disease to End-Stage Renal Disease (ESRD) (Ezenwaka, Idris, Davis and Roberts, 2016). CKD Stage-4 and Stage-5 are known to be the most critical stages in CKD, with mortality being the ultimate fatality if not treated on time.

Common comorbidities found in patients with CKD stage-4 and 5 are Hypertension, Diabetes, Hyperlipidemia (Wen-Chin et al., 2018), and Chronic Glomerulonephritis (CGN) (Soyibo & Barton, 2009). Elderly kidney transplant recipients, for example, may face higher risks of immunosuppression-related complications and increasing frailty due to a higher burden of comorbidities (Pinter et al., 2016). Thus, the influences of comorbidities can possibly influence the progression and recovery of disease. Not much can be said about the

recovery of renal function for renal failure patients who are dialysis-dependent as they rarely regain renal function (Agraharkar, Nair, Patlovany, 2003). Thus, a complete cure might not always be a feasible goal for patients suffering from CKD. Older people on dialysis experience higher burden and effects of Kidney Disease and illustrate low levels of Health Related Quality of Life and well-being (Shah et al., 2019). Therefore, the ultimate goal for patients with advanced Chronic Kidney Disease might be to achieve good Health Related Quality of Life.

Health Related Quality of Life is a multidimensional construct incorporating physical, psychological, and social functioning domains that are affected by an individual's disease and treatment (Sprangers, 2002). The concept of "Health Related Quality of Life" can be referred to as a patient's health state in association with Quality of Life (Karimi & Brazier, 2016). In the past, Quality of Life was referred to as "Having a Good Life" (Sosnowski et al. 2017). Character Strengths was identified as respectable traits that are expected to contribute to "Good Life" (Peterson and Seligman, 2004). This suggests possible associations between Character Strengths and Quality of life but not necessarily Health Related Quality of Life.

While there are many similar concepts of strengths such as: "Internal Strengths," "External Strengths," "Character Strengths" and "Virtues and Vices," they are all interconnected as they represent positive human traits. Patient Inner Strengths were found to be significant predictors in Health Related Quality of Life (Dingley & Roux, 2013). The field of psychology and behavioral science sees the importance of including patient strengths in illness management as a way to inspire and stimulate patients, thereby indirectly improving their health and well-being (Mirkovic et al., 2016). Strengths that are found to be relevant to health and well-being in patients with chronic illness are internal strengths: being persistent, having a positive outlook, being kind, caring, experiencing positive emotions, being kind towards oneself, reconciling oneself with the situation, having courage, knowledge and

insight, and external strengths include: family support, friends, peers and health-care providers (Kristjansdottir et al., 2018). Character Strengths usage proved to be a significant predictor of "Well Being" but, interestingly, not Health Related Quality of Life (Linley, 2011). This is interesting because, Health Related Quality of Life is significantly associated with Well-Being (Spiro & Bossé, 2000). These findings suggest that Character Strengths might have an indirect influence on Health Related Quality of Life. Internal Strengths, for example, can be considered similar to Character Strengths. Internal strengths have been proven to be associated with Health Related Quality of Life. Therefore, there is not much reason to think that a significant relationship between Character strength and Health Related Quality of is non-existent. However, the current research field lacks in examining Character Strengths and Health Related Quality of Life in patients with chronic illness.

The importance of Character strengths is not to be underestimated as it is considered to be the foundation for life-long development and thriving that are linked to essential individual and social well-being traits (Park and Peterson, 2009). Traits and states are notions individuals use to define and understand both themselves and other people. Traits are therefore considered stable, long-term, and caused from within an individual while states are momentary, short-term, and caused by external conditions (Chaplin, John and Goldberg, 1988). The concept "Character Strengths" for example, can be considered a stable trait in human beings. Character Strengths have been found to have positive influences on patients with chronic illness that are linked to lower comorbidities (Hanks, Rapport, Waldron-Perrine, 2014). In addition, Character Strengths are associated with recovery from illness by means of elevated strengths of character that contribute to renewed life satisfaction after the crises of having a disease has ran its course (Peterson, Park, Seligman, 2006). This, in turn, makes increasing Health Related Quality of Life through stimulation of Character Strengths in patients with CKD increasingly imperative.

Another important concept when having Chronic Kidney Disease is that of "Coping." For patients with at least one form of chronic illness, "Coping" is considered a complex, dynamic, cyclical, and multidimensional process involving self-management, integration, and adjustment to attributes (Ambrosio et al., 2015). "Coping" is seemingly situationally dependent as there are several ways in which people cope with one or more forms of chronic illness. Coping strategies can, therefore, be referred to as specific efforts employed by people to manage stressful events (Taylor & Seeman, 1999). This concept has been widely researched in the medical and psychological fields. There are several indications that Coping styles are predictors of both Quality of Life (Lysandropoulos & Havrdova, 2015) and Health Related Quality of Life (Kaltsouda et al., 2011). Patients who suffer from a variety of stresses and face Coping challenges regularly has a low Quality of Life (Kolahi et al., 2015). Thus, not all coping styles are considered to have positive influences on individuals with chronic health conditions. Some Coping styles are considered "Active," while others are considered "Passive/Maladaptive." Active Coping is considered using instrumental support, using emotional support, planning, positive reframing, and acceptance, while Passive/ Avoidant (maladaptive) Coping is considered: self-distraction, behavioral disengagement, venting, substance use, self-blame and denial (Eldred, 2011). Most individuals develop more adaptive coping styles as they grow older (Diehl, Chui, Lumley, Grühn and Labouvie-Vief, 2014). From this point of view, "Coping" reflects a particular behavior. Thus, it can be considered a "state" as it reflects a momentary condition. States are considered transient, short-term, and caused by external circumstances (Chaplin, John and Goldberg, 1988).

Several studies have recognized that "states" (Character Strength) and "traits" (Coping style) are associated with Health Related Quality of life. However, more understanding can be established by exerting the how and when one phenomena X affects another Y in the presence of another phenomena M, because establishing associations alone does not translate

into deep understanding even when a causal association can be found (Hayes, 2013). This process is referred to as a mediation process where M indirectly influences the relationship between X and Y. Temporary conditions (a state) have been proven to mediate the role between a "trait" and Health Related Quality of Life. For example, the level of Sense Of Coherence (SOC) has been proven to decrease after an adverse life event (Volanen, 2011). Therefore, it cannot be considered a "trait but rather a "state." This "state" (SOC) has been found to have a mediating role in Health Related Quality of Life (Rohani et al., 2015). Another state-like concept: Emotional Coping style, was also found to have mediating roles between personality trait openness and Health Related Quality of life (Pereira-Morales, Adan, Leon and Forero, 2018). This suggests that "Coping styles" (a state) can possibly mediate the relationship between personality (a stable trait) and Health Related Quality of Life. Coping does not necessarily need to have a mediating role between a state and a trait.

Coping does not necessarily need to have a mediating role between a state and a trait. Coping can also be considered a moderator. A moderator is the effect of X on variable Y by M, if its size, sign or strength depends on or can be predicted by M (Hayes, 2013). Low levels of positive religious coping, for example, had proven to be a moderator between seeking social support and post-traumatic symptom growth (García, Páez, Reyes and Àlvarez, 2017). Coping styles (task-focused, emotion-focused, and avoidance coping) were also found to have a moderating role between perfectionism (a trait) and suicidal ideation (Abdollahi and Carlbring, 2018). This means that coping can either have a mediating or moderating role in the relationship between Character strengths and Health Relating Quality of Life.

While there are quite an amount researches that focus on Health Related Quality of life and Coping in patients with chronic illness including, no research was found on "Character strengths" in patients with CKD neither associating "Character Strengths" with

Health Related Quality of Life and Coping styles. Therefore, the objective of this research is to assess Health Related Quality of Life, Character Strengths and the role of "Coping styles" in patients with Chronic Kidney Disease who are in pre-dialysis Stage-4 and those who are currently receiving dialysis in Stage-5. Thus, this study will:

(a) Investigate the Health Related Quality of Life in patients living with Chronic Kidney Disease stages four and five,

(b) Examine the association between character strengths and Health Related Quality of Life,

(c) Assess patients coping styles in CKD stages four and five and lastly,

(d) analyze whether Coping styles" mediate or moderate the relationship between Character Strengths and Health Related Quality of Life.

A heuristic model for this hypothesized relationship can be found in figure 1 below.

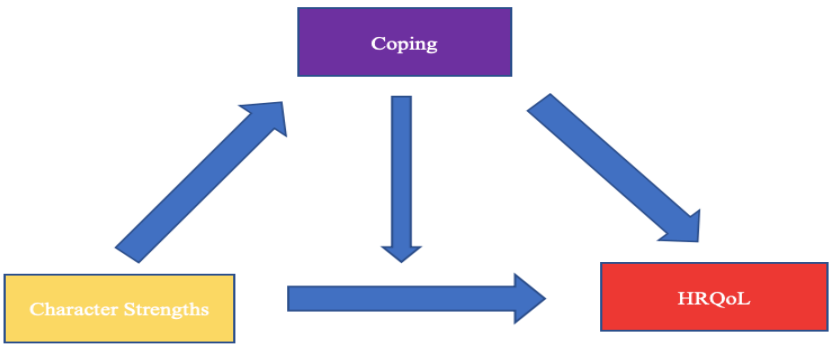

Figure 1. Heuristic model of research design

Method

Procedure

This study was approved by the research ethics committee of the Twente University, Raad van Bustuur of Dr. Horacio E Oduber Hospital, Management team of the Imsan and Medical Ethical committee of the Horacio E Oduber Hospital. Participants were approached during their routine clinic visit between the 10th of February 2019 and the 15th of March 2019. The sampling method used in this research was a form of convenience sampling, as participants were selected on the basis of their convenient accessibility and availability. Participation inclusion criteria were: 18 years or older and either in stage-4 or stage-5 of Chronic Kidney Disease for a period of more than four months. Participants were excluded for: being younger than 18 years of age, being either in stage-4 or stage-5 CKD for a period of fewer than four months, inability to partake in full conversations, or continuously sleeping during dialysis treatment.

Instructions

Participants were first informed about the research process (see appendix 1). Patients who showed interest were then asked to take an adjusted version of the Mini-Mental State Examination (MMSE) before completing the research. This was necessary to ensure that participants had no severe cognitive impairments. An example of the adjustments made to the MMSE and scoring can be retrieved in Appendix 2. Scoring of the MMSE was, according to StudyLIB (2019). After receiving satisfactory scores for the MMSE (total = > 24), participants were then given a consent form for participating in the research (see appendix 3 for consent form). This research entailed answering to several self-report standardized health questionnaires that can be found in appendix 4. The digital system “Qualtrics” was used as a

data collection tool facilitating the surveys: Health Related Quality of Life, Character Strengths, and Coping styles.

Instruments

The *Health Related Quality of Life SF-36* form was used to asses Health Related Quality of life in patients with Chronic Kidney Disease stages 4 and 5. The scoring of the research instrument was conducted using the SF-36 Scoring instructions: Rules for the RAND 36-Item Health Survey (version 1.0) (Rand Corporation, 2019). The questionnaire consisted of 36 items that provided a generic core and overall health rating item (Hays, Kallich, Mapes, Coons, Amine and Carter, 1997). The SF-36 assesses eight domains; physical functioning, role limitations due to physical health problems, role limitations due to personal or emotional problems, emotional wellbeing, social functioning, bodily pain, general health, and energy/fatigue. The mean score of HRQoL in CKD patients was found to be, on average, 60.3 (Ghiasi et al., 2018). The extent to which the Health Related Quality of Life was considered low, medium, or high in this research was determined by the mean (μ) score of the Health Related Quality of Life questionnaire, which was composed of all eight subscales. Low Health Related Quality of Life was considered when μ ranged between 1 – 35, average Health Related Quality of Life was considered when μ ranged between 36 – 60, and high Health Related Quality of Life was considered when μ ranges between 61 – 100. Question two of the SF-36 asking participants to compare their health between their current status and one year ago was excluded because some patients were not in their current chronic kidney disease stage a year ago, and thus responses would have reflected some participants answering based on having the disease in their current stage while other participants would be reflecting based on not having the disease and or being in a different stage of CKD.

Leaving out this question did not affect the averaging of scales as this question was not a part of the eight domains/subscales.

The SF-36 is considered a valid Health Related Quality of Life assessment instrument for Chronic Kidney Disease population (Aguiar, Pei, Qureshi and Lindholm, 2018). This questionnaire was used in a several of researches with similar target groups and has illustrated good reliability, Cronbach's $\alpha \geq 0.70$ and high validity ranging between SD 22.1 and 40.78 (Rand, 2019). The Cronbach's alpha is one of the many types of internal reliability estimates assessing the consistency of responses on a combination measure containing more than one component (Chen & Krauss, 2004). Even though there is no absolute standard for categorizing reliability, a Cronbach's alpha between $\alpha = .70$ and $\alpha = .90$ are considered as the minimally acceptable (Lauriola, 2004). In this current study, the overall Reliability of the questionnaire was considered acceptable as the Cronbach's $\alpha = .79$. The Cronbach's alpha if item was deleted at subscale level were all lower than $\alpha = .79$ but still higher than .70. This suggested that the survey items pertaining to HRQoL were internally consistent, and all subscales contribute to internal consistency.

Character strengths was assessed using the Character Strengths Rating Form (CSRF, Adapted by J. Haidt, from M.E.P. Seligman (2002). This is a 24-item questionnaire that incorporated a nine-point Likert Scale ranging from "very much unlike me" to "very much like me"). The participants indicated the degree in which the strengths were applicable to them. This questionnaire was proven to be a reliable and valid measure of the 24-character strengths of Peterson and Seligman's classification (Ruch, Martínes-Martí, Proyer and Harzer, 2014). In this research, the overall reliability of the CSRF instrument was acceptable with a Cronbach's α of $\alpha < .74$. Interestingly, the results of Cronbach's alpha if item is deleted show that the overall reliability would be increased between .02 and .05 if Character

Strength Justice and Temperance would be deleted. There might be a number of reasons for these findings. For example, reliability can possibly be increased if Character Strength Justice was deleted is because reliability can be negatively influenced by the number of items in each scale (Cortina, 1993). Another reason for this is that the Corrected Item Total Correlation for Justice is .21, and Transcendence is .25. This indicated that there are items in these scales that correlate poorly with the total scale score. Providing that there would be no drastic increase in reliability, it was not chosen to delete any items.

Coping was assessed with the Brief-COPE questionnaire which determine ways in which people cope with their chronic illness. This questionnaire assessed fourteen Coping styles applied by patients with chronic illness: self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioral disengagement, venting, positive reframing, planning, humor, acceptance, religion and self-blame (Carver, 1997). The participants responded to a total of 28 questions with four options ranging from "I haven't been doing this at all" to "I do this a lot". The 28 questions were then clustered together according to the criteria of Carver (1997) in the proposed Coping styles. In this current study, the overall reliability $\alpha = .71$ was considered acceptable. This suggested good internal consistency.

Participants Demographics

Information reflecting the exact number of patients suffering from Chronic Kidney Disease in Aruba was not retrievable. However, there are approximately 972 chronic kidney disease patients registered in the database of the Dr. Horacio E Oduber Hospital of which 51 patients were in the pre-dialysis phase (stage-4) and 87 patients were undergoing dialysis in (stage-5). Of the 138 patients registered at the Dr. Horacio E Oduber Hospital having stage-4, and stage-5 chronic kidney disease, 54 participated in this research. The IMSAN health clinic

was not able to provide data reflecting how many Chronic Kidney Disease patients they had registered. However, at the time of this research, there were a total of 68 patients undergoing dialysis treatment. Of the 68 patients registered with stage-5 Chronic Kidney Disease, 35 patients participated in this research. Altogether, there was a total of n = 89 participants from stage-4 and stage-5 chronic kidney disease who participated in this research. The demographic characteristics of this research sample are depicted in Table 1.

The age between participants varied, with the youngest participant being 33 years old and the eldest being 90 years old. The mean age of the participants was $\mu = 67$ years old. Most participants (76.4%) were considered being in the "Mature Adulthood" life stage between the ages of 51 and 80 years old. The second largest group (13.5%) was part of the "Late Adulthood" life stage, being 81+ years old. Even though CKD are known to be more prevalent in females compared to males (Goldberg & Krause, 216), this sample consisted of more male (n = 56) than female (n = 33) participants. One reason for this could be that more males are known to suffer from end-stage renal disease (stage-5) (Goldberg & Krause, 2016), which in turn was the most prevalent stage in this sample. Results relating to comorbidities illustrated that the majority of participants (84%) had one or more forms of co-morbid diseases. The three most prevalent co-morbid diseases were Hypertension (34.2%), Diabetes (33.6%) , and Cardiovascular disease (20.1%).

Table 1

Demographic Characteristics of Participants

Characteristics	N = 89	Male	Female
Age Group			
"Early Adult Age" 21-35 years old	2		
"Middel Age" 36 – 50 years old	7		
"Mature Adulthood" 51 – 80 years old	68		
"Late Adulthood" 81+ years	12		
Gender		56	33

CKD stage-4	14
CKD stage-5	75
Most common comorbidities	
Diabetes	50
Hypertension	51
Cardiovascular Disease	30
Race	
Indian (Cacique, Caiquetio, Arawak ect.)	35
White	18
Black	14
Latino	13
Other	9
Education	
Primary school (basis school)	22
High school (MAVO, HAVO, VWO)	17
Vocational school (EPB, EPI)	35
Higher Education (HBO,WO and higher)	8
None	7
Native Language	
Papiamento	65
Spanish	11
English	8
Dutch	3
Other	2

Even though the majority of the participants (76.4 %) were born in Aruba, only 56.2% of the respondents had parents who were also born in Aruba. This indicates that a little less than half of the participants relating to both parents being Aruban born is not more than second-generation Arubans. This possibly explains why the majority of the participants (39.3%) considered themselves to be from an Indian (Cacique/Caquetio, Arawak) background, while 20.2% considered themselves to be “white” and 15.7 % considered themselves to be “black” or “African American.”

Most participants lived in the city of Oranjestad (30%) and San-Nicolaas (29%). Approximately 87% of the participants have children, and the majority (79%) reported living with one or more persons in house indicating a possibly good support system. The educational levels of the patients varied. The majority, (39%) finished vocational schooling (EPB, EPI) and 25% had completed primary school. Combined, 64% of the participants had a level of education of primary school and higher, suggesting a moderately educated sample. Even though the official languages of Aruba are both Dutch and Papiamento, the three most dominant languages spoken amongst the participants where Papiamento (73%), Spanish (12%) and English (9%). The overall self-score reflecting understanding and speaking of the English language in the entire sample was rated as satisfactory (6.0). Thus, this sample is fascinating as it represents a multi-ethnic and moderately high educated group.

Data Analysis

Throughout the data set, there were only two missing values. However, given that this is less than 10% of the overall answers of the respondents, these missing values were replaced by means. In order to answer the research questions a-d, several statistical tests were run in SPSS. Descriptive statistical analyses illustrated that the data was not normally distributed in this research. Even though it is more common to report the median when data is not normally distributed; it was decided to report the mean pertaining to aspects of Health Related Quality of Life, Character Strengths, and Coping Styles. The mean of the items was used to distinguish between low, average, and high levels of Health Related Quality of Life, applicability of Character Strengths, and Coping styles. Thus, the mean was reported to provide more clarity on the three variables: Health Related Quality of Life, the applicability of Character Strengths, and Coping styles.

Given the non-normality of the data, a Mann-Whitney U test was used to assess differences that may exist between gender and stages of illness, and the Kendall's tau test was used to measure the univariate correlations between the variables. Statistical significance was determined with a p-value <. 05 and the strength of the correlation was determined with the criteria of Akoglu (2018).

Regression analyses were performed using PROCESS regression path analysis modeling tool to facilitate question (d) in analyzing whether Coping styles" mediate or moderate the relationship between Character Strengths and Health Related Quality of Life. For this analysis, Character Strengths were treated as the independent variable, Health Related Quality of Life was treated as the dependent variable and both active and passive Coping styles were treated as the mediating/moderating variables. When moderation was tested, the strength, and direction of the relationship between Character Strengths (X), and Health Related Quality of Life(Y) was assumed to be affected by Coping styles. When mediation was tested, it was assumed that Character Strengths (X) would have helped to predict and explain variability in coping styles (M), which was, in turn, is hoped to predict and explain variability in Health Related Quality of Life (Y).

Thus, the goal of this analysis was to determine whether the indirect effect is mediated or moderated, and if so, interpret the meaning of the mediation or moderation of the indirect effect. While the usual statistical analyses use $p < .05$ to distinguish between hypotheses acceptance or rejection; The PROCESS approach probes mediation/moderation when the 95% CI of the indirect effect (a*b) does not straddle zero. However, should in case the 95% CI of the indirect effect (a*b) does include zero, a definite claim of mediation/moderation cannot be made (Hayes & Rockwood, 2017).

Ethical Considerations

This study was approved by the research ethics committee of the Twente University, Raad van Bustuur of Dr. Horacio E Oduber Hospital, Management team of the Imsan and Medical Ethical committee of the Horacio E Oduber Hospital to protect the rights of research participants. Participants were provided with information about the: research purpose, procedure, benefits, and risks. Digital consent was obtained from the participants after information provision. Thus, participation in this study was completely voluntary, with an option to discontinue at any point in time if so desired. Most importantly, this research offered complete anonymity for participants. Patients were assigned to a particular number rather than using a name.

Results

Health Related Quality of Life

In general, the Health Related Quality of Life (HRQoL) sample mean subscale scores ranged between μ = 37.3 and μ = 79.8, indicating an average to high level of HRQoL for patients in this research group. The average HRQoL mean score for the complete sample was μ = 60.3, indicating an average HRQoL. Irrespective of gender, individuals scored lower on subscales Role Limitation due to Physical health (μ = 37.4) and General Health (μ = 51.4.). However, they are still considered within the average HRQoL range. The descriptive statistics of HRQoL differentiating males and females, CKD stage-4 and CKD stage-5 are depicted in Table 2.

Table 2

Health Related Quality of Life, Gender & CKD Stages

HRQoL	Total Mean & SD	Male Mean & SD	Female Mean & SD	Mann-Whitney U (Gender)	Stage-4 Mean & SD	Stage-5 Mean & SD	Mann-Whitney U (CKD Stages)
EWB	79.8/18.1	80.7/17.9	78.0/18.6	844	78.8/21.5	79.9/17.5	504
SF	77.1/29.4	78.9/27.5	74.2/32.6	876	90.1/21.4	74.6/30.2	364
RLEP	69.3/44.7	71.4/44.6	65.6/45.2	861	78.5/42.5	67.5/45.1	458
P	67.8/32.7	72.3/30.4	60.1/35.5	739	68.5/29.7	67.6/33.5	515
EF	61.7/23.9	65.8/23.5	54.8/23.3	***670****	56.7/27.2	62.6/23.3	462
PF	56.1/33.7	60.2/32.6	49.9/35.0	761	72.8/31.3	53.0/33.5	***341****
GH	51.4/22.9	52.6/22.0	49.2/24.4	869	50.7/28.1	51.5/22.0	524
RLPH	37.4/42.6	37.9/43.1	36.3/42.4	917	48.2/47.4	35.3/41.7	444
HRQoL	60.3/21.1	62.9/20.2	55.9/22.1	762	67.1/23.1	59.0/20.6	407

Note: EWB = Emotional Wellbeing, SF = Social Functioning, RLEP = Role limitations due to emotional problems, P = Pain, EF = Energy/Fatigue, PF = Physical Functioning, GH = General Health, RLPH = Role Limitations due to Physical Health. N = 89, Female (N = 33), Male (N = 56). Low HRQoL (μ = 1 – 35), Average HRQoL (μ = 36 – 60) and High HRQoL (μ = 61 – 100). * Correlation is significant at the 0.05 level (2-tailed), ** Correlation is significant at the 0.01 level (2-tailed).

With a mean score of $\mu = 62.9$ for males and $\mu = 55.9$ for females; Health Related Quality of Life is perceived to be high for males and average for females. However, these gender differences were not considered statistically significant ($U = 762$, $p = .160$). At the subscale level, males scored high on five out of the eight subscales (Emotional well-being, Social Functioning, Role limitations due to emotional problems, Pain and Energy/Fatigue) while females scored high on merely three out of the eight subscales (Emotional well-being, Social Functioning and Role limitations due to emotional problems).

A Mann-Whitney U test was conducted to determine whether the scores of males and females were significantly different from each other. Results of the Mann-Whitney U test revealed significant differences between males (Mdn = 67.6, n = 56) and females (Mdn = 50.0, n = 33) pertaining to subscale Energy ($U = 670$, $z = -2.164$, $p = .030$, $r = -.229$. These findings indicated that Energy was significantly greater for males compared to females. This suggest a lower quality of life in females pertaining to the Energy domain. In order to quantify the differences between the two groups, the effect size r was calculated using the formula $r = \frac{Z}{\sqrt{N}}$ (Fritz, Morris and Richler, 2011). However, the difference of $r = -.229$ is considered small according to Cohen's guidelines (Cohen, 1988).

When looking at the differences between stage-4 and stage-5 CKD patients, it was evident that the overall HRQoL of patients in stage-5 was relatively lower than individuals in stage- 4. However, this difference was not statistically significant ($U = 407$, $p = .184$). At the subscale level, both groups scored high on subscales: Emotional well-being, Social Functioning, Role limitations due to emotional problems and Pain. Individuals in stage-4 CKD scored additionally high on Physical Functioning. Results of the Mann-Whitney U test revealed significant differences between individuals in stage-4 (Mdn = 87.5, n = 14) and stage-5 (Mdn = 50.0, n = 75) pertaining to physical functioning ($U = 341$, $z = - 2.079$, $p =$

.038, r = 0.220). These findings suggest that patients in stage-5 had lower HRQoL pertaining to physical functioning compared to stage-4 CKD patients. However, the difference of r = 0.220 is considered small according to Cohen's guidelines (Cohen, 1988).

When age is taken into account, results show that individuals 50 years and younger had a higher HRQoL mean score ($\mu = 69.6$) compared to individuals of 51+ year old ($\mu = 59.3$). However, results of a smaller age division indicated that individuals in their later adulthood (81+ years) had a higher HRQoL mean score ($\mu = 64.6$) compared to individuals in their mature adulthood age 51-80 ($\mu = 58.3$). This indicated that younger individuals do not necessarily have a better Health Related Quality of life compared to older individuals. However, these differences were not statistically significant ($U= 353$, $p = .463$).

When looking at the differences between patients with one or more forms of chronic illnesses, it appeared that individuals with one or more co-morbid diseases had a lower overall Health related Quality of Life mean score ($\mu = 59.3$) compared to individuals who reported not having any co-morbid diseases ($\mu = 65.4$). This suggest that co-morbid diseases can possibly influence the HRQoL of individuals. However, the results comparing individuals both with and without co-morbid diseases were not statistically significant ($U = 445$, $p = .370$).

Character strengths

Similar to Health Related Quality of Life, individuals also encompass character strengths that are applicable in daily life, especially when having to cope with one or more forms of chronic illness. This research assessed a total of 24 character strengths which was then clustered into six main character strengths. The six main character strengths were then assumed to be those that best describe the participants. Results indicated that Character strength "Transcendence" ($\mu = 84.3$) best described the participants in this research.

Transcendence represented a combination of character strengths: Appreciation of beauty, Gratitude, Hope, Humor, and Spirituality. The second-best Character Strength that described the participants in this research was that of Courage ($\mu = 75.4$) which represented a combination of: Bravery, Honesty, persistence, and Zest. These results are depicted in Table 3.

Table 3

Mean score on Character Strengths for total sample, and stratified for Gender and CKD Stage

Character Strength	Total Mean & SD	Male Mean & SD	Female Mean & SD	Mann-Whitney U	Stage-4 Mean & SD	Stage-5 Mean & SD	Mann-Whitney U
Transcendence	84.3/21.8	85.3/21.5	82.7/22.4	812	83.5/21.5	84.5/21.9	506
Courage	75.4/37.6	76.0/37.4	74.6/38.4	867	92.4/9.2	72.3/40.0	384
Humanity	68.9/35.3	65.1/36.7	75.2/32.1	738	69.0/38.8	68.8/35.4	525
Temperance	60.6/38.4	61.1/38.1	59.8/39.4	923	71.4/40.2	58.6/38.0	390
Wisdom	51.8/43.1	53.2/41.9	49.3/45.5	891	58.2/31.1	50.6/45.1	509
Justice	38.2/47.0	40.4/48.2	34.3/45.2	889	47.2/50.1	36.4/46.5	472
Overall Character Strength	68.7/24.8	69.7/25.7	67.0/26.4	893	73.8/67.7	67.7/27.2	492

Note: N = 89, Stage-4 (N = 14), Stage-5 (N = 75). Wisdom (Creativity, Curiosity, Judgment, Love of Learning, Perspective), Courage (Bravery, Honesty, persistence, Zest), Humanity (Kindness, Love, Social Intelligence), Justice (Fairness, Leadership, Teamwork), Temperance (Forgiveness, Humility, Prudence, Self-Regulation) Transcendence (Appreciation of beauty, Gratitude, Hope, Humor, Spirituality). * Correlation is significant at the 0.05 level (2-tailed), ** Correlation is significant at the 0.01 level (2-tailed).

Results of a Mann-Whitney test indicated that there were no significant gender or stage of illness differences. Thus, findings remained fairly consistent for both male and female patients in stage-4 and stage-5. Even though it was tempting to use the total score of the SF-36 in analysing the association between Character Strengths and Health Related

Quality of Life, it was decided not as the validity of the total Health Related Quality of Life can be questionable and such total measure may contribute to a biased body of knowledge (Lins & Carvalho, 2016). A Kendal Tau correlation analysis between overall Character Strength and HRQoL subscales were conducted. Results illustrated that patient's overall character strength was proven to be positively correlated with HRQoL subscales energy/fatigue $\Gamma\tau = .26, p < .05$, emotional wellbeing $\Gamma\tau = .23, p < .05$ and general health $\Gamma\tau = .17, p < .05$. This suggest that increase in overall strength possibly contributes to better HRQoL in the area of energy/fatigue, emotional well-being and general health. The correlational analysis is depicted in table 4.

Table 4

Association between Health Related Quality of Life and Character Strengths

Variable	PF	RLPH	RLEP	EF	EWB	SF	P	GH
Overall Strength	.12	.02	.14	.26**	.23**	.04	.08	.17*

Note: N = 89, Statistical Test Kendal Tau, EWB = Emotional Wellbeing, SF = Social Functioning, RLEP = Role limitations due to emotional problems, P = Pain, EF = Energy/Fatigue, PF = Physical Functioning, GH = General Health, RLPH = Role Limitations due to Physical Health. Overall CS = Overall Character Strength, * Correlation is significant at the 0.05 level (2-tailed), ** Correlation is significant at the 0.01 level (2-tailed).

Coping

The top five "Coping styles" applied by patients in this sample were: acceptance (μ = 91.9), religion (μ = 75.0), positive Reframing (μ = 74.3), active Coping (μ = 73.7) and emotional support (μ = 67.4). When distinguishing between active Coping and passive Coping, results indicated that the participants engaged in more "Active Coping" (μ = 71.3) compared to "Passive/Avoidant (maladaptive) Coping" (μ = 27.2). These results remained consistent throughout gender and illness stage. The descriptive statistics of "Coping styles" are depicted in Table 5.

Table 5

Mean score on Coping Styles for total sample, and stratified for Gender and CKD Stage

	Total Mean & SD	Male Mean & SD	Female Mean & SD	Mann-Whitney U	Stage-4 Mean & SD	Stage-5 Mean & SD	Mann-Whitney U
Acceptance	91.9/18.4	93.7/14.0	88.8/24.1	869	98.1/4.4	90.6/19.8	431
Religion	75.0/35.8	69.0/38.5	85.3/28.1	***694*** *	65.4/39.4	76.8/35.0	450
Positive Reframing	74.3/28.7	76.1/26.9	71.2/31.8	872	72.6/25.8	74.6/29.4	474
Active Coping	73.7/31.3	75.8/30.3	70.2/33.2	829	73.8/29.7	73.7/31.8	518
Emotional Support	67.4/28.8	70.5/26.5	62.1/32.0	800	60.7/28.9	68.6/28.8	439
Instrumental Support	66.4/31.5	67.8/30.9	64.1/32.8	881	57.1/31.8	68.2/31.3	410
Self-Distraction	59.7/38.1	61.3/39.3	57.7/36.5	869	36.9/40.3	64.0/36.5	***319*** **
Planning	54.1/36.6	58.0/36.7	47.4/35.8	767	46.4/28.6	55.5/37.9	443
Humor	46.8/42.6	47.0/43.3	46.4/42.0	911	27.3/39.5	50.4/42.4	367
Self-Blame	35.2/37.5	36.0/35.0	33.8/41.5	887	28.5/35.4	36.4/37.8	476
Denial	30.5/34.0	30.3/34.6	30.8/33.3	899	36.9/34.0	29.3/34.0	455
Venting	19.1/29.6	20.5/16.6	16.6/27.6	858	13.9/28.6	20.2/29.9	462
Behavioral Disengagement	15.5/31.9	13.6/30.9	18.6/33.7	820	9.5/27.5	16.6/32.7	456
Substance Use	1.8/6.3	1.4/5.7	2.5/7.3	878	2.3/6.0	1.78/6.4	494
Subscale Passive Coping	27.2/18.8	27.6/18.7	26.6/19.2	903	21.2/21.0	28.4/18.2	385
Subscale Active Coping	71.3/20.2	73.7/20.0	67.3/20.3	740	68.2/17.8	81.9/20.7	440

Note: N = 89, Female (N = 33), Male (N = 56). Active Coping (instrumental support, emotional support, planning, positive reframing and acceptance), Passive Coping (self-distraction, behavioral disengagement, venting, substance use, self-blame and denial); * Correlation is significant at the 0.05 level (2-tailed), ** Correlation is significant at the 0.01 level (2-tailed).

A Mann-Whitney U test was conducted to determine whether the scores of males and females were statistically different from each other. Results of the Mann-Whitney U test revealed significant differences between males (Mdn = 100, n = 56) and females (Mdn = 100, n = 33) with regard to subscale "Religion" (U = 693.500, z = -2.226 , p = .026, r = -.236). these findings hereby indicated that "Religion" was significantly greater for females compared to males. In order to quantify the differences between the two groups, the effect size r was calculated using the formula $r = \frac{Z}{\sqrt{N}}$ (Fritz, Morris and Richler, 2011). Even though males were found to engage in less "Religious" Coping styles compared to females, the difference of r = -.236 is considered small according to Cohen's guidelines (Cohen, 1988).

A Mann-Whitney U test was also conducted to determine whether the scores pertaining to Coping styles of patients in CKD stage-4 and stage-5 were statistically different from each other. Results showed statistically significant differences between patients in stage-4 (Mdn = 25.0, n = 14) and stage-5 (Mdn = 66.7, n = 75) with regard to subscale "Self-distraction" (U = 318.500, z = -2.396 , p = .017, r = -.254). These findings hereby indicated that "Self-distraction" was significantly greater for patients with CKD stage-5 compared to patients with CKD stage-4. In order to quantify the differences between the two groups, the effect size r was calculated using the formula $r = \frac{Z}{\sqrt{N}}$ (Fritz, Morris and Richler, 2011). However, the difference of r = -.254 is considered small according to Cohen's guidelines (Cohen, 1988).

Do "Coping styles" mediate or moderate the relationship between Character Strengths and Health Related Quality of Life?

Literature considered Coping styles as mediators in health outcome and thus it was also expected to be mediators between character strengths and Health Related Quality of Life. According to Baron & Kenny (1986), in order to be able to answer this research question, results must reflect significant associations between a) Character Strengths and Coping style, b) Coping style & Health Related quality of life and c) Character Strength & overall Health Related quality of life. This is considered the A-B-C path. However, significant associations in all three paths are no longer necessary when using the PROCESS model by Hayes (2017). In order to assess the extent in which Active and Passive Coping were "Mediators" a number of regression analyses were performed using PROCESS regression path analysis modeling tool. A total of 16 models were analyzed in order to confirm the role of active and passive coping as a mediator. The combined 24 character strengths was considered the independent variable (X), active coping and passive coping were considered mediators (M) and the eight HRQoL subscales (Emotional Wellbeing, Social Functioning, Role limitations due to emotional problems, Pain, Energy/Fatigue, Physical Functioning, General Health and Role Limitations due to Physical Health) were considered the dependent variable (Y). Providing that data was not normally distributed, this mediation analysis used a bootstrapping with 10000 resamples. Table 6 depicts the findings illustrating the mediation analyses conducted.

Table 6

Testing Active and Passive Coping styles in 16 mediation models between Character Strengths and HRQoL with bootstrapping

	Active coping as Mediator			
HRQoL subscales	B	t	p-value	95% CI
Emotional Well Being				
A-B	.36	4.88	.00	-.05 - 0.11
B-C	.26	3.35	.00	
A-C'	.08	.82	.41	
Social Functioning				
A-B	3.36	4.88	.00	-.16 - .09
B-C	.07	.48	.63	
A-C'	-.06	-.31	.76	
Role Limitation Emotional Problem				
A-B	.36	4.88	.00	-.18 - .20
B-C	.24	1.17	.25	
A-C'	.09	.35	.73	
Pain				
A-B	.36	4.88	.00	-.17 - .14
B-C	.27	1.76	.08	
A-C'	-.02	-.09	.93	
Energy/Fatigue				
A-B	.36	4.88	.00	-.02 - .17
B-C	.32	3.17	.00	
A-C'	.21	1.62	.11	
Physical Functioning				
A-B	.36	4.88	.00	-.14 - .14
B-C	.31	2.04	.04	
A-C'	.01	.07	.94	
General Health				
A-B	.36	4.88	.00	-.07 - 0.15
B-C	.23	2.26	.03	
A-C'	.11	.87	.39	
Role Limitation Physical Health				
A-B	.36	.48	.00	-.31 - .11
B-C	.15	.74	.46	
A-C'	-.13	-.51	.61	

Passive coping as Mediator

Mediators	B	t	p-value	95% CI
Emotional Well Being				
A-B	-.07	-.88	.38	-03 - .11
B-C	0.26	4.44	.00	
A-C'	-.48	-6.12	.00	
Social Functioning				
A-B	-.07	-.88	.38	-.05 -.13
B-C	.01	.05	.96	
A-C'	-.59	-3.80	.00	
Role Limitation Emotional Problems				
A-B	-.07	-.88	.38	-.07 - .24
B-C	.21	1.24	.22	
A-C'	-1.01	-4.40	.00	
Pain				
A-B	-.07	-.88	.38	-.04 - .12
B-C	.23	1.76	.08	
A-C'	-.48	-2.69	.01	
Energy/Fatigue				
A-B	-.07	-.88	.38	-.02 - .04
B-C	.39	4.27	.00	
A-C'	-.11	-.86	.39	
Physical Functioning				
A-B	-.07	-.88	.38	-.04 - .10
B-C	.29	2.18	.03	
A-C'	-.44	-2.41	.02	
General Health				
A-B	-.07	-.88	.38	-.02 - .08
B-C	.25	2.85	.01	
A-C'	-.32	-2.68	.01	
Role Limitation Physical Health				
A-B	-.07	-.88	.38	-.06 - .20
B-C	.04	.25	.18	
A-C'	-.85	-3.79	.00	

A-B = independent variable Character Strengths to mediator Coping style; B-C = Mediator Coping style to Dependent variable (HRQoL subscales); A-C'= independent variable Character Strengths through mediator Coping style (indirect effect).

At least one of the three paths (A-B-C) illustrated significant associations. In order to assume mediation, the lower and upper confidence intervals should not straddle zero. Therefore, the results of the mediation analyses in the 16 models confirmed that Active nor Passive coping styles did not have a mediating effect between patient Character Strengths and Health Related Quality of Life subscales.

In order to assess if active and passive coping had moderating roles between Character Strengths and HRQoL subscales, a total of 16 regression analyses were performed using the PROCESS macro. The results of the analyses are depicted in table 7.

Table 7

Testing moderation effect of Active and Passive Coping styles on the relationship between Character strengths and HRQoL

	Passive Coping				
Model	Character Coefficient	Moderator Coefficient	Interaction Coefficient	F	95% CI
Emotional Well Being R^2 = .4663 R^2 change = .0441**	.02	-1.07**	.01**	24.75**	.0021 - .0150
Social Functioning R^2 = .1505 R^2 change = .0055	-.13	-.93	.00	5.01*	-.0083 - .0181
Role Limitation Emotional Problems R^2 = .2215 R^2 change = .0169	-.16	-1.90**	.01	8.06**	-.0061 - .0323
Pain R^2 = .1231 R^2 change = .0066	.06	-.89	.01	3.98*	-.0089 - .0210
Energy/Fatigue R^2 = .2051 R^2 change = .0176	.19	-.60	.01	7.31**	-.0032 - .0175
Physical Functioning R^2 = .1303 R^2 change = .0110	.51*	.11	-.01	4.25*	-.0233 - .0073
General Health					

R^2 = .1803 R^2 change = .0175	.06	-.79*	.01	6.23**	-.0033 - .0169
Role Limitation Physical Health R^2 = .1492 R^2 change = .0030	-.12	-1.22	.02	4.97*	-.0138 - .0245

Active Coping

Model	Character Coefficient	Moderator Coefficient	Interaction Coefficient	F	95% CI
Emotional Well Being R^2 = .2077 R^2 change = .0310	.63*	.46*	-.01	7.43**	-.0124 - .0005
Social Functioning R^2 = .0155 R^2 change = .0127	.45	.33	-.01	.4461	-.0179 - .0056
Role Limitation Emotional Problems R^2 = .0372 R^2 change = .0103	.77	.63	-.01	1.09	-.0260 - .0091
Pain R^2 = .0876 R^2 change = .0455*	1.08*	.81	-.01*	2.72*	-.0256 - -.0005
Energy/Fatigue R^2 = .2050 R^2 change = .0001	.34	.23	-.00	7.30**	-.0089 - .0082
Physical Functioning R^2 = .0891 R^2 change = .0290	.98*	.69	-.01	2.78*	-.0236 - .0022
General Health R^2 = .1026 R^2 change = .0002	.20	.08	.00	3.24*	-.0082 - .0093
Role Limitation Physical Health R^2 = .0660 R^2 change = .0593*	1.35*	1.09	-.02*	2.00	-.0359 - -.0028

Note: Independent Variable = Character Strength, Moderator = Active and Passive Coping, Dependent Variable = Health Related Quality of Life Subscales

Results from table 7 illustrate that Character Strengths is a much better predictor of Emotional well-being than Passive coping. In addition, Character strengths was also a much

better predictor of pain and role limitation due to physical functioning than Active coping. The interaction of Character Strengths and passive coping styles added significantly beyond the main effects (R^2 change = .044, p<.001) indicating statistically significant interactions between Character Strengths and Coping style in predicting emotional well-being. This interaction effect is considered large according to Aguinis, Beaty and Pierce (2005). In addition, the interaction of Character Strengths and Active coping styles added significantly beyond the main effects indicating statistically significant interactions between Character Strengths and active Coping style in predicting pain (R^2 change = .046, p<.05) and role limitation due to physical functioning (R^2 change = .060, p<.05). These interactions were also considered large.

Results of the conditional effects for the predictor values of the moderator indicated a partial moderation of Passive Coping between Character Strengths and Emotional wellbeing (b = .01, + (85) = 2.65, CI = .0021 to .0150, p = .01). When looking at different levels of passive coping styles which was distinguished between low, medium and high coping. Results showed that only when patients had medium (b = .23, + (85) = 4.11, CI = .1200 to .3445, p <. 001) and high levels (b = .42, + (85) = 5.02, CI = .2557 to .5906, p <. 001) of Passive Coping, does Character Strengths positively affect Health Related Quality of Life. The effects are reversed at low levels of passive coping because Character Strengths no longer played a part when having low levels of passive coping. Providing that the slopes were positive, it was presumed that in situations where Character Strengths were deficient; Emotional Well-Being was increased with the application of more passive coping styles. In order to visualize under what specific levels of passive coping and Character Strengths there is proof of moderation, Johnson-Neyman test results was used to plot a figure 2: moderation analysis Character Strength and Passive Coping on Emotional Well-being.

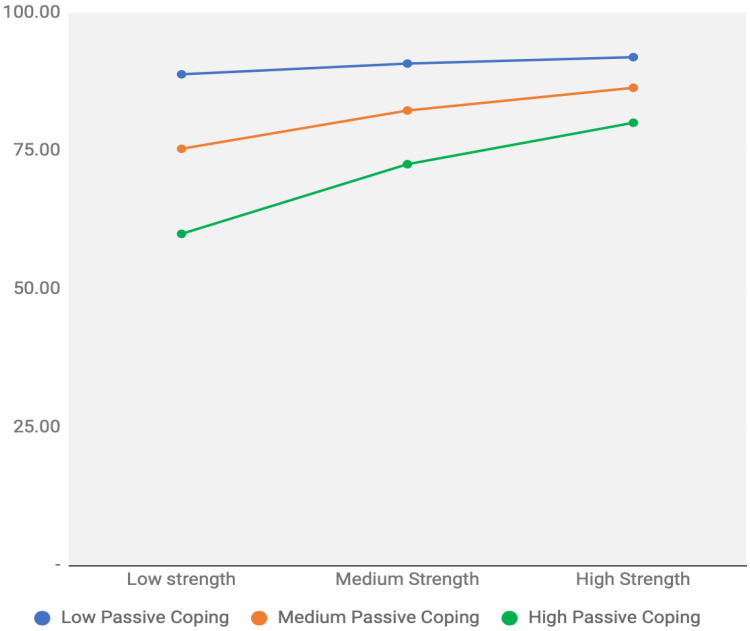

Figure 2: moderation analysis Character Strength and Passive Coping on Emotional Well-being

When analyzing the relationship between Character Strengths, Active Coping and HRQoL; results indicated that "Active" coping style partially moderated the relationship between character strengths and subscale Role Limitation due to Physical Functioning b = -.0193, + (85) = -2.32, CI = -.0359 to -.0028, p = .02. Results of the conditional effects for the predictor values of the moderator indicated that the association between Character Strengths and Role Limitation due to Physical Functioning seem to be stronger for people with low levels of Active coping b = .44, + (85) = 1.89, CI = -.0213 to .9027, p <.05 and absent for people with medium and high "Active" coping. Thus, only for individuals who had low Active Coping, a significant effect was observed of Character Strengths on Role limitation due to physical functioning. Providing that this slope was positive, it is presumed that patients had better HRQoL in the area of Role Limitation due to Physical Functioning with the application of low levels of active coping styles when Character strengths was a shortage. In order to visualize under what specific levels of active coping and Character Strengths there is proof of

moderation, Johnson-Neyman test results was used to plot a figure 3: moderation analysis Character Strength and Active Coping on Role Limitation due to Physical Functioning.

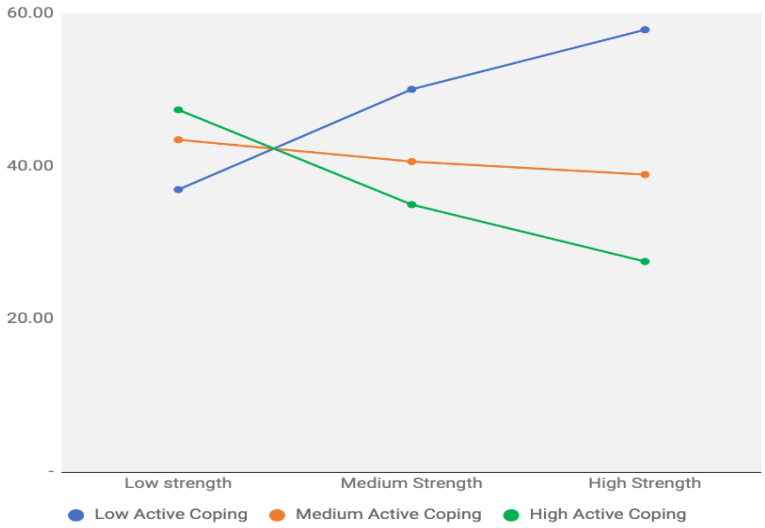

Figure 3: moderation analysis Character Strength and Active Coping on Role Limitation due to Physical Functioning

Figure 3 also illustrated that Character Strengths did not play a role for individuals who exhibited medium and high levels of Active Coping on Role Limitation due to physical functioning.

Lastly, results also indicated that "Active" coping style partially moderated the relationship between character strengths and subscale Pain b = -.01 + (85) = -2.05, CI = -.0256 to -.005, p = .04. The conditional effects for the predictor values of the moderator indicated that the association between Character Strengths and Pain seem to be stronger for patients with low levels of Active coping b = .46, + (85) = 2.62, CI = .1122 to .8143, p = .01, and absent for people with medium and high "Active" coping. Reverse effects were observed in cases where patients had medium and high levels of active coping as Character Strengths no longer played a role then in Health Related Quality of Life subscale pain. In order to visualize under what specific levels of active coping and Character Strengths there is proof of

moderation, Johnson-Neyman test results was used to plot a figure 4: moderation analysis Character Strength and Active Coping on Pain.

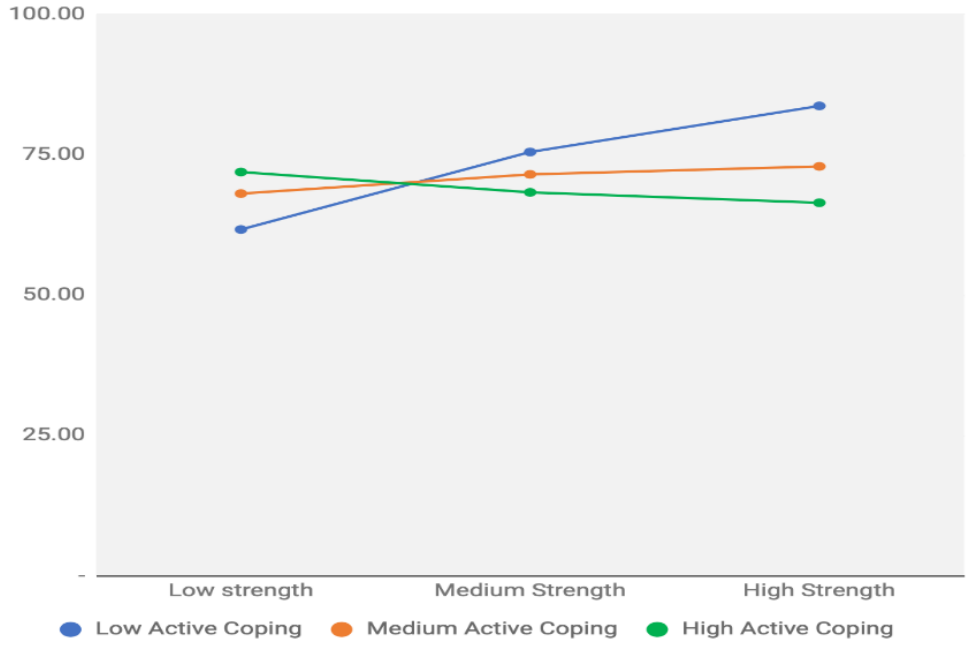

Figure 4: moderation analysis Character Strength and Active Coping on Pain

Discussion

Health Related Quality of Life has been an important focal point for researchers over the past few years. For patients with non-curable and life-threatening chronic illnesses such as Chronic Kidney Disease, achieving a good Health Related Quality of Life might be equal to if not more important than achieving long life. A large proportion of Aruban Kidney patients in CKD stages 4 and 5 participated in this research. In general, findings pertaining to the average Health Related Quality of life for patients with Chronic Kidney Disease Stage four and five in Aruba is relatively consistent with "Developed" countries such as China (Wong et. al, 2019), USA, Canada (Mujais et. al, 2009), Austria (Perales, Duschek & Reyes del Paso, 2016) and South Africa (Ikechi, Tebogo & Charles, 2013).

Strengths and Coping styles have been identified as significant predictors of Health Related Quality of Life (Dingley & Roux, 2013; Kaltsouda et al., 2011). "Traits" have been known to influence "States" in a variety of situations (Clark, Vittengl, Dolores and Jarrett, 2003); (Magee & Biesanz, 2019). A number of researches suggest that Coping styles mediated the relationships between "State" and "Trait" (Kristofferzon, Engström and Nilsson, 2018), (Sanjuán & Magallares, 2014). However, no research was found analyzing the relationship between Character Strengths, HRQoL, and if it was best explained by their relationship through coping styles in patients with CKD. Also, no research was found assessing if coping styles can possibly affect the strength and direction between character strengths and HRQoL. Therefore, this current research study moves beyond the traditional Character Strength, Health Related Quality of life and Coping style correlational analyses onto analyzing if Coping styles have mediating or moderating roles in the relationship between Character Strengths and HRQoL.

Against expectation, neither active or passive coping styles were mediators in the relationship between Character Strengths and HRQol. However, both active coping and passive

coping styles had partial moderating roles in the relationship between Character Strength and a number of Health Related Quality of life Subscales. Medium and High levels of Passive coping was found to have a partial moderating effect in the relationship between character strengths and emotional well-being. This indicated a protective effect of low passive coping on potential harmful effects of shortage in Character Strengths on emotional well-being. In addition, low levels of active coping had a partial moderating effect in the relationship between Character Strengths and pain, and Character Strengths and role limitation due to physical functioning. These findings also indicated that low Active Coping protects against the detrimental effects of shortage in Character Strengths on pain and role limitation due to physical functioning. A potential reason that moderation was observed only in these three subscales is that moderation effect are generally smaller than the usual small effect defined by Cohen 1988 (Aguinis, Beaty and Pierce (2005).

These findings confirm literature and research findings that Character strengths and Coping styles are significantly associated with Health Related Quality of life to some extent. Even though coping styles did not have a mediating effect, coping styles illustrated partial moderation in the relationship between Character Strengths and Health Relating Quality of Life thereby confirming the hypothesis of Coping style as a moderator. One possible explanation is that coping styles are dependent on the individual's environment, behavior and cognitive appraisals (Folkman and Lazarus, 1984). Most of the participants in this research partook during dialysis treatment hours in the clinic which can be considered a stressful environment for patients after a long period of time. The extent in which individuals use particular coping styles depend on a number of factors: Social Environment, Psychosocial factors, Behavioral factors, Risk factors and kidney outcomes (Bruce et. al, 2009). It could be possible that patient's Passive Coping styles and the environment influenced the relationship between Character Strengths and HRQoL. For example, self-distraction was found to be

significantly more in patients undergoing dialysis than patients in stage 4. Thus, patients might engage in self-distraction due to long hours of dialysis treatment. Self-distraction, being considered a form of passive coping can compensate in increasing emotional wellbeing when Character Strength is not optimal. Character Strength Transcendence had best described patients in this research. The subscale Transcendence is a culmination of: Appreciation of beauty, Gratitude, Hope, Humor and Spirituality.

Gratitude for example does not contribute to dimensions of well-being (Wijayanti et al., 2018). From a dimentional perspective, health in relation to quality of life can relate to well-being (Salvador-Carulla et al., 2014). Thus, gratitude does not necessarily contribute to HRQoL much less emotional well-being. Hope on the other hand, can have both positive (Perveen, 2019) and negative (Szramka-Pawlak, Hornowska, Walkowiak and Zaba, 2014) influence on Health Related Quality of Life. In addition, humor have been found to be beneficial to Quality of Life in situations where individuals have to cope with or recover from stressful situations (Papousek, 2018). And lastly, spirituality is a known predictor of emotional well-being (Bai, 2018). Thus, in specific situations where individuals experience low hope, lack of spirituality and humor; Passive coping can be considered as a protective factor.

It is also possible that patient's Active Coping styles, and behavior influenced the relationship between Character Strengths, and HRQoL. Despite the challenges created by chronic illness on the individual, people develop, over time, positive perspectives and experiences in their lives (Martz and Livneh, 2007). For individuals undergoing dialysis, the treatment can be seen as a means for prolonged life. This turn explains why transcendence was the most applicable character strengths for individuals in this current research study. Individuals irrespective of gender and chronic kidney disease stage, engaged in more "Active Coping" rather than "Passive Coping". Patients in CKD stages 4 and 5 are usually aware that they are not as physically active compared to healthy individuals. Thus, it can be assumed that

they accept their health status. Acceptance (a form of active coping) was after all the most adopted coping style by patients.

There is evidence that humor is positively associated with pain tolerance (Martin, 2004). Thus, in situations where pain is high, and humor is low, active coping can possibly function as a defensive mechanism. Measures of spirituality often include measurements of existential wellbeing (Visser, 2016). Existential wellbeing in turn, has been positively associated with the physical health composite of HRQoL (Dalminda, Holstad, Dilorio and Laderman, 2011). Thus, it can also indicate that perhaps Spirituality can be related to the physical health composite of HRQoL. In this case, in circumstances where spirituality is low, active coping can function as a protective factor for Role limitations of Physical functioning. Thus, when the use of Character strengths are limited, low active coping can in turn contribute to better HRQoL in the area of pain management and role limitations due to physical health.

On the overall, these findings suggest that medium and high levels of passive coping serve as a protector against the harmful impact of poor character strengths on Emotional wellbeing. In addition, low levels of active coping serve as a protector against the harmful impacts of poor character strengths on pain and role limitation due to physical health. These findings seem to be in line with the hypotheses made. However, more research is needed to in this area.

Conclusion

Health Related Quality of Life in patients with Chronic Kidney Disease in Aruba is similar to more developed countries such as USA, Canada, Austria and Cape Town Africa. However, there is still room for improvement. More females than males reported limitations in the areas of Physical functioning, Role limitations due to physical health and general health. Character strength have been found to be significantly associated with HRQoL

subscales. In particular, “Transcendence” representing a combination of: Appreciation of beauty, Gratitude, Hope, Humor and Spirituality illustrated to be the most dominant strength amongst the participants in the research. Literature supports the positive effects of gratitude, hope, humor and spirituality and it warns of the repercussions of a lack of hope, humor and spirituality on Health Related Quality of Life. Thus, these strengths are crucial as being challenged by a life-threatening disease makes individuals appreciate smaller things in life, be more grateful and hope for prolonged life.

Patients engaged consistently in more ‘Active” than “Passive” coping. However, males and CKD stage 5 patients engaged in more active coping compared to females and CKD stage 4 patients. This suggest that more attention be payed to patients of female gender and CKD stage 4. These findings are important as other studies in the field suggested that “Active” coping is essential in achieving Health Related Quality of Life in patients with one or more forms of chronic illness. Even though “Active” and “Passive” coping styles did not prove to be mediators in the relationship between Character Strengths and Health Related Quality of Life, low levels of Active and medium and high levels of Passive coping had proven to be a significant moderators in the relationship between Character Strengths and three Health Related Quality of Life subscales. This signifies that both low active and medium/ high passive coping styles can compensate for deficient of Character Strengths on Health Related Quality of Life.

Recommendations

In order to improve HRQoL in patients with Chronic Kidney Disease in Aruba, further analysis of factors influencing chronic kidney disease such as social environment, psychosocial factors, behavioral factors, risk factors and kidney outcomes are necessary. This research has illustrated significant associations between character strengths and HRQoL. All

character strengths are believed to be equally important especially when having to cope with a life-threatening disease. However, patients had below average score pertaining to character strength Justice (fairness, leadership, teamwork). Thus, on one hand, perhaps actual interventions geared towards stimulating these strengths are necessary. On the other hand, the majority of individuals already actively cope with their disease which has proven to be a protective factor against poor character strength. Thus, these developing character strengths might not be necessary. Research lacks in this area and it is hereby recommended to assess if coping styles alone are enough to actually increase patients overall Health related Quality of Life.

Limitations

Participants with CKD-stage 4 had limited mobility which in turn influenced their ability to participate in this research. Therefore, these findings are not completely generalizable to all CKD stage 4 patients. Another limitations of this research can be "multiple testing". This study incorporated three research tools. A total of 24 character strengths, 14 coping styles and 8 HRQoL subscales were assessed for. For the mediation/moderation analysis, a total of 32 analyses were computed. In all of the analyses, there was a 5% chance of accepting false positive effects. However, results were relatively consistent in this research as the HRQoL was considered average to high with no gender of stage differences and individuals adopted more active than passive coping styles. This suggest that the results were not by chance. In addition, this research categorized coping styles as Active and Passive Coping. However, this is not advisable in correlational analyses as it does not facilitate information on causalities. Another limitation is that coping is not a specific behavior that can be observed neither a belief that can be reliably reported. But this does not make it any less of an important influence on HRQoL that is worth reporting.

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Appendix 1

Introduction

Dear Sir/Madam,

I Vandana Geerman, Masters' degree student in Health Psychology and Technology kindly invite you to participate in a scientific research at the Imsan/ Dr. Horacio E. Oduber Hospital in Aruba. Participation in this research is completely optional. However, before deciding to do so, I hereby provide you with important information about this research. Please read this information letter thoroughly. Should there be questions regarding this research, please feel free to ask these to my person as the lead researcher in this project at: v.s.geerman@student.utwente.nl

1. Purpose of this study

The purpose of this study is to: (a) assess the Health Related Quality of Life in patients living with Chronic Kidney disease stages four and five (pre-dialysis and dialysis), (b) examine the association between character strengths and high levels of Health related Quality of Life and (c) Identify the top five coping strategies used to cope with Chronic Kidney disease stages four and five, (d) examine the extent to which the top five coping styles mediate between character strengths and high levels of Health related Quality of Life. In addition, this research aims to identify differences that may exist between genders and different stages of Chronic Kidney disease. The information gathered from this research will further help health care professionals in providing the best patient centered care possible which in turn will possibly increase patient Health Related Quality of Life.

2. Implementation process:

This specific study consists of survey questionnaires consisting of four different parts: Background information, Kidney Disease Health Related Quality of Life questionnaire, Character Strengths questionnaire and a Coping questionnaire. The questionnaires address your perception of the above-mentioned themes in relation to your chronic illness. The

questionnaire will take approximately one hour to complete at the medical center where dialysis treatment is offered at your time of convenience. This questionnaire will be available digitally using Qualtrics which a system that allows researchers to digitally gather data from respondents and easily export this using another data analysis software called SPSS.

3. Your Task for this research

After you have read this document, you can decide to participate in this research or respectfully decline. If you respectfully decline to participate, there will be no repercussions. When you agree to participate, the researcher will plan a date for answering the questionnaires either together or forward you a link to do so individually while being at the dialysis clinic. While you and the researcher are making plans, you can decide what is most convenient for you. Prior to starting the questionnaires, you are expected to sign a consent form acknowledging that you have been adequately informed about this research and agree to participate in this research.

4. Pros and cons of partaking in this research

By participating in this research, you play an active role in your own healthcare. This information facilitates healthcare professionals and policy makers in understanding what drives you in life in light of your chronic illness. You not only contribute to making improvements in scientific research but also contribute to improving the quality of life of yourself and many others who have one or more forms of chronic illnesses.

Cons can be considered that you have to spend approximately one hour on answering questionnaires which in turn can consume energy and bring up some uncomfortable memories. Should incase this research bother you in manner which you feel you have to talk to someone, you can contact the lead researcher who will refer you to a healthcare professional from the dialysis center staff.

5. What happens to the information collected?

This research is anonymous to the extent that no names or form of identification is required. You are only assigned to a research number. Thus, this makes is impossible to track

individual participant answers. The information gathered can however be seen by the lead researcher, persons that guide the research and ethical committees who consented to this research. After gathering all the data for this research, the information will be summarized, links will be made to draw conclusions and answer the proposed research questions. This will be presented in the form of a Master's thesis which will be submitted for grading at the Twente University in the Netherlands.

6. Medical-ethical procedure undergone for this research

This research has complied with the research ethical procedures and standards of the research ethical committee of Twente University, the Dr. Horacio E Oduber Hospital Ethical committee and the Raad van Bestuur of the Dr. Horacio E Oduber Hospital in Aruba. In addition, agreement for conducting this research was obtained from the Imsan Medical Center in Aruba.

7. Costs associated with when agreeing to participate in research

For this specific research, there are no payment offered to participants. Participants will not receive any form of transportation costs or funds associated with completion of this research. This research is thereby completely voluntary. This means that you can opt out of completing the questionnaire at any point in time.

8. Additional questions

Any questions you may have is highly appreciated before or during the completion of the questionnaires. In case of such please contact the lead researcher Vandana Geerman at: WhatsApp:+2976600002 or +2975642303 or via email at v.s.geerman@student.utwente.nl,

Sincerely,

Vandana Geerman, Thesis researcher
Health Psychology and Technology
Twente University

Appendix 2

During the pilot test, it was observed that some of the questions in the original MMSE were not applicable to individuals living in Aruba. The island has no seasons as there is always sunshine and an average of 30 degrees Celsius which is considered summer temperature. Aruba has no States as they usually refer to different parts of Aruba as cities. The question seeking to address on which floor of the Hospital the research took place was not fully applicable for the participants at IMSAN clinic as participants commented that according to the elevator, they are on floor one meanwhile floor one is considered ground floor. To facilitate the spelling of the word WORLD in the MMSE; participants were allowed to spell the word world in Papiamento and Spanish which are both MUNDO. The participants in CKD stage 5 answered the research questions while undergoing dialysis. This made it difficult for the patients to comply with two of the commands of the MMSE which were to take a blank paper, fold it in half with their right hand then put it on the floor and draw over a specific picture. For this reason, participants were instead instructed to take a blank paper with one hand, fold it in half and give it back with the same hand they took it. With regards to drawing an object, the participants were instead asked to state the colors of the Aruban flag. When patients were instructed to make up a sentence containing a noun and a verb, they were allowed to do so in the Papiamento, English, Spanish or Dutch language and instead of writing it themselves, it was written out for them. It is important to note that all the questions were formulates in the English language. However, to ensure better understanding, the lead researcher communicated the questions in the native language of the participants. The adjusted questionnaire can be retrieved hereafter.

Mini-Mental State Examination (MMSE)

Patient's Code: _____ Date: _____

Instructions: Ask the questions in the order listed. Score one point for each correct response within each question or activity.

Maximum Score	Patient's Score	Questions
5		"What is the year? Season? Date? Day of the week? Month?"
5		"Where are we now: State? Country? Town/city? Hospital? Floor?"
3		The examiner names three unrelated objects (house, car, shoes) clearly and slowly, then asks the patient to name all three of them. The patient's response is used for scoring. The examiner repeats them until patient learns all of them, if possible. Number of trials: _____
5		"I would like you to count backward from 100 by sevens." (93, 86, 79, 72, 65, ...) Stop after five answers. Alternative: "Spell WORLD or MUNDO backwards." (D-L-R-O-W) or (ODNUM)
3		"Earlier I told you the names of three things. Can you tell me what those were?" (house, car, shoes)
2		Show the patient two simple objects, such as a wristwatch and a pencil, and ask the patient to name them.
1		"Repeat the phrase: 'No ifs, ands, or buts.'"
3		"Take the paper in one hand, show that you can fold it in half, and give the paper back with the same hand you took it with." (The examiner gives the patient a piece of blank paper.)
1		"Please read this and do what it says." (Written instruction is "Close your eyes.")
1		"Make up and write a sentence about anything." (This sentence must contain a noun and a verb.)
1		What are the colors of the Aruban flag? (Blue, Red, Yellow and white)
30		TOTAL
		Fail: < 24
		Pass: > 24

Instructions for administration and scoring of the MMSE

Orientation (10 points):

- Ask for the date. Then specifically ask for parts omitted (e.g., "Can you also tell me what season it is?"). Aruba has no season. Accept answer: Summer or Winter. One point for each correct answer.
- Ask in turn, "Can you tell me the name of this hospital (town, county, etc.)?" One point for each correct answer. Aruba has no state. Accept the same answer for city and state as it is considered the same thing. The hospital flooring is confusing. Accept answers as: floor one, two or ground floor.

Registration (3 points):

- Say the names of three unrelated objects clearly and slowly, allowing approximately one second for each. After you have said all three, ask the patient to repeat them. The number of objects the patient names correctly upon the first repetition determines the score (0-3). If the patient does not repeat all three objects the first time, continue saying the names until the patient is able to repeat all three items, up to six trials. Record the number of trials it takes for the patient to learn the words. If the patient does not eventually learn all three, recall cannot be meaningfully tested. For each

properly repeated item give a one point score with a maximum of 3 points. The three related objects are HOUSE, CAR and SHOES.

- After completing this task, tell the patient, "Try to remember the words, as I will ask for them in a little while."

Attention and Calculation (5 points):

- Ask the patient to begin with 100 and count backward by sevens. Stop after five subtractions (93, 86, 79, 72, 65). Score the total number of correct answers.
- If the patient cannot or will not perform the subtraction task, ask the patient to spell the word "world" or mundo backwards. The score is the number of letters in correct order (e.g., dlrow=5, dlorw=3). For each correct letter a score of 1 point is assigned with a maximum of 5 points. Patients are allowed to spell MUNDO as is means world. The scoring remains the same.

Recall (3 points):

• Ask the patient if he or she can recall the three words you previously asked him or her to remember. Score the total number of correct answers (0-3).

Language and Praxis (9 points):

- Naming: Show the patient a wrist watch and ask the patient what it is. Repeat with a pencil. Score one point for each correct naming (0-2). Show the patients, a Pen and Wristwatch
- Repetition: Ask the patient to repeat the sentence after you ("No ifs, ands, or buts."). Allow only one trial. Score 0 or 1.

3-Stage Command: Give the patient a piece of blank paper and say, “Take the paper in one hand, show that you can fold it in half, and give the paper back with the same hand you took it with.” (The examiner gives the patient a piece of blank paper.) Score one point for each part of the command correctly executed.

- Reading: On a blank piece of paper print the sentence, "Close your eyes," in letters large enough for the patient to see clearly. Ask the patient to read the sentence and do what it says. Score one point only if the patient actually closes his or her eyes. This is not a test of memory, so you may prompt the patient to "do what it says" after the patient reads the sentence.

- Writing: not all participants were in a writing state. They were instructed to “Make up and a sentence about anything.” (This sentence must contain a noun and a verb.) The instructor will write it down.
- Ask the patient the color of the Aruban Flag. Score one point if all the colors are correctly stated. (Blue, Red, Yellow and White).

Appendix 3

Consent Form for Health Related Quality of Life, Character Strengths and The Role of Coping Style in Patient With Chronic Kidney Disease Stage four and five in Aruba.

Please tick the appropriate boxes	**Yes**	**No**
Taking part in the study		
I have read and understood the study information dated 14/01/2019 – 14/03/2019 or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	□	□
I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	□	□
I understand that taking part in the study involves me answering questions from a survey questionnaire individually. If I am unable to do so, the lead researcher will facilitate this process.	□	□
Risks associated with participating in the study		
I understand that taking part in the study involves the following risks: giving up approximately one hour of my time, may cause some mental discomfort when addressing questions about my illness and may be energy consuming.	□	□
Use of the information in the study		
I understand that information I provide will be primarily used for writing a Master's thesis. In addition, this information will possibly guide health care professionals in improving healthcare for patients with Chronic Kidney Disease thereby increasing patient Health Related Quality of Life.	□	□

I understand that personal information collected about me that can identify me, such as [e.g. where I live], will not be shared beyond the study team. □ □

Future use and reuse of the information by others

I give permission for the survey database that I provide to be archived so it can be used for future research and learning. □ □

I agree that my information may be shared with other researchers for future research studies that may be similar to this study or may be completely different. The information shared with other researchers will not include any information that can directly identify me. Researchers will not contact me for additional permission to use this information. □ □

Contact Information for Questions about Your Rights as a Research Participant

If you have questions about your rights as a research participant, or wish to obtain information, ask questions, or discuss any concerns about this study with someone other than the researcher(s), please contact the Secretary of the Ethics Committee of the Faculty of Behavioural, Management and Social Sciences at the University of Twente by ethicscommittee-bms@utwente.nl

Appendix 4

Demographic Characteristics

Dear Participants,

This section of the survey questionnaire seeks to gain information regarding your demographic characteristics. These questions address areas of you living situation. Please answer the questions by filling in the answer as requested.

Participant number: _____

1. What type of Kidney Disease do you have?

- Stage 4 (Pre-Dialysis)
- Stage 5 (Undergoing Dialysis)
- Other

2. How long have you had Advanced Chronic Kidney Disease (in the stage mentioned previously)?

_____ Months

3. Do you have any co-morbid chronic diseases?

- No
- Yes, Diabetes
- Yes, Hypertension
- Yes, Hyperkalemia
- Yes, Cardiovascular disease
- Yes, Anemia

- Other _____

4. Which district do you live in?

- Noord
- Oranjestad
- Paradera
- San Nicolaas
- Santa Cruz
- Savaneta

5. Were you born in Aruba?

- Yes
- No

6. Were both your parents born in Aruba?

- Yes
- No

7. Were your parents born in Aruba?

- Yes
- No

8. What is your Native Language?

9. How would you rate your English Language Proficiency?

1 2 3 4 5 6 7 8 9

10. What is your year of birth? _____

11. Which race do you consider yourself to be?

- White
- Black or African-American
- Indian (Cacique, Caquetio, Arawak ect.)
- Asian
- Latino
- Other

12. What is your gender?

- Male
- Female
- Other

13. Do you live alone?
    - Yes
    - No

14. Do you have any children?
    - Yes
    - No

15. Which is the highest level of education that you have completed?
    - Primary school (basis school)
    - High school (MAVO, HAVO, VWO)
    - Vocational school (EPB, EPI)
    - Higher Education (HBO, WO and higher)
    - None

Health Related Quality of Life

Dear participants,

This section of the research address your personal views about **your** health. For this reason, the questions ask about your health and life in light of having a Chronic Kidney Disease. Please answer the questions by filling in the answer as requested.

16. In general, would you say your health is:

(Circle One Number)

Excellent …….	1
Very good ……	2
Good …….....	3
Fair ……..…….	4
Poor……...	5

17. The following items are about activities you might do during a typical day. **Does your health now limit** you in these activities? If so, how much?

(Circle One Number on Each Line)

	Yes, Limited a Lot	Yes, Limited a Little	No, Not Limited at All
a. **Vigorous activities**, such as running, lifting heavy objects, participating in strenuous sports….	1	2	3

b. **Moderate activities**, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf.…	1	2	3
c. Lifting or carrying groceries……	1	2	3
d. Climbing **several** flights of stairs…	1	2	3
e. Climbing **one** flight of stairs……	1	2	3
f. Bending, kneeling, or stooping……	1	2	3
g. Walking **more than a mile**…….	1	2	3
h. Walking **several blocks**……..	1	2	3
i. Walking **one block**……..	1	2	3
j. Bathing or dressing yourself……	1	2	3

18. During the **past 4 weeks**, have you had any of the following problems with your work or other regular activities **as a result of your physical health**?

(Circle One Number on Each Line)

	Yes	No
a. Cut down the **amount of time** you spent on work or other activities……..	1	2
b. **Accomplish less** than you have liked?.....	1	2
c. Were limited in the **kind** of work or other activities?.....	1	2
d. Had **difficulty** performing the work or other activities (for example, it took extra effort)?.....	1	2

19. During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of any emotional problems** (such as feeling depressed or anxious)?

(Circle One Number on Each Line)

	Yes	No
a. Cut down the **amount of time** you spent on work or other activities……..	1	2
b. **Accomplish less** than you have liked?.....	1	2
c. Didn't do work or other activities **as carefully as usual**?.....	1	2

20. During the **past 4 weeks,** to what **extent** have your **physical health or emotional problems** interfered with your normal social activities with family, friends, neighbors, or groups?

(Circle One Number)

Not at all …….	1
Slightly ……	2
Moderately ……..	3
Quite a bit ……..……..	4
Extremely…….	5

21. How much **bodily** pain have you had during the **past 4 weeks**?

(Circle One Number)

None ……	1
Very mild ……	2
Mild ……	3
Moderate……..	4
Severe……...	5
Very Severe……..	6

22. During the **past 4 weeks,** how much did **pain** interfere with your normal work (including both work outside the home and housework)?

(Circle One Number)

Not at all …….	1
A little bit ……	2
Moderately ……..	3
Quite a bit ……..……..	4
Extremely…….	5

23. These questions are about how you feel and how things have been with you **during the past 4 weeks.** For each question, please give the one answer that comes closest to the way you have been feeling.

How much of the time during **the past 4 weeks**….

(Circle One Number on Each Line)

	All of the Time	Most of the Time	A Good Bit of the Time	Some of the Time	A Little of the Time	None of the Time
a. Did you feel full of pep?.....	1	2	3	4	5	6
b. Have you been a very nervous person?.....	1	2	3	4	5	6
c. Have you felt so down in the dumps that nothing could cheer you up?...	1	2	3	4	5	6

d. Have you felt calm and peaceful?.....	1	2	3	4	5	6
e. Did you have a lot of energy?.....	1	2	3	4	5	6
f. Have you felt downhearted and blue?.....	1	2	3	4	5	6
g. Did you feel worn out?.....	1	2	3	4	5	6
h. Have you been a happy person?....	1	2	3	4	5	6
i. Did you feel tired?.....	1	2	3	4	5	6

24. During the **past 4 weeks,** how much of the **time** have your **physical health or emotional problems** interfered with your social activities (like visiting with friends, relatives, ect.)?

(Circle One Number)

All of the time ……	1
Most of the time……..	2
Some of the time ……	3
A little of the time ……	4
None of the time……	5

25. Please choose the answer that best describes how **TRUE** or **FALSE** each of the following statements is for you.

(Circle One Number on Each Line)

	Definitely True	Mostly True	Don't Know	Mostly False	Definitely False
a. I seem to get sick a little easier than other people……	1	2	3	4	5
b. I am as healthy as anybody I know…..	1	2	3	4	5
c. I expect my health to get worse……..	1	2	3	4	5
d. My health is excellent……...	1	2	3	4	5

Signature Strengths Rating form

Dear participants,

This section of the research address your character strengths as a person. These are strong aspects/ characteristics of you as an individual. For this reason, the questions ask about your character strengths in light of having a Chronic Kidney Disease. Please answer the questions by filling in the answer as requested.

Instructions

Everyone has a characteristic set of strengths and virtues, that is, things that they are "good" or "strong" on. The following 24 statements reflect characteristics. However, it is expected that you answer only in terms of weather the statement describes what you are like as a person. Be honest and please do not provide answers describing yourself as someone you aspire to be.

Please read the descriptions of the 24 strengths and virtues below. First, rate each character strength in the rating scheme box with: - 4 = very much unlike me, -3 = rather unlike me, -2 = somewhat like me, -1 = slightly unlike me, 0 = neither nor, 1 = slightly like me, 2 = somewhat like me, 3 = rather like me and 4 = very much like me.

Number	Character strengths	explanation	Rating scheme
1	**Creativity (originality, ingenuity)**	Creative people have a highly developed thinking about novel and productive ways to solve problems and often have creative and original ideas. They do not content	

		themselves with conventional solutions if there are better solutions.	
2	**Curiosity (interest, novelty-seeking, openness to experience)**	Curious people Take an interest in all ongoing experience in daily life for its own sake and they are very interested in and fascinated by various topics and subjects. They like to explore and discover the world, they are seldom bored, and it's easy for them to keep themselves busy.	
3	**Judgment & open-mindedness (critical thinking)**	People with a highly developed judgment thinks things through, like to question thoughts and beliefs, and examine them from all sides. They do not jump to conclusions and build on facts while making decisions. They are able to change their mind in light of evidence.	
4	**Love of Learning**	Curious people and those who are willing to learn like to Master new skills,	

		topics, and bodies of knowledge, and are excited about learning. They add new skills and abilities or expand existing knowledge.	
5	**Perspective (wisdom)**	People with this strength are considered as being wise and are asked for advice by others. They see the big picture and a mature view on life.	
6	**Bravery (valor)**	Brave and courageous people do not shrink from threat, challenge, difficulty or pain. They speak up for their opinions and convictions even if there is opposition.	
7	**Perseverance (persistence, industriousness)**	Persistent and industrious people finish what start, even in spite of obstacles. They do not allow themselves to be distracted by inner or outer factors and take pleasure in completing tasks.	

8	**Honesty (authenticity, integrity)**	Honest people speak the truth but more broadly present themselves in a genuine way and acting in a sincere way. They have both feet planted firmly on the ground and are without pretense.	
9	**Zest (vitality, enthusiasm, vigor, energy)**	Zestful people pursue their goals with a lot of energy and enthusiasm. They do not do things halfway or halfheartedly, they love what they do and look forward to every new day. They live life as an adventure.	
10	**Capacity to love and be loved**	People with a highly developed capacity to love and a secure attachment value close relations with others, in particular those in which sharing and caring are reciprocated.	

11	**Kindness (generosity, nurturance, care, compassion, altruistic love, "niceness")**	Kind and generous people like doing favors and good deeds for others. They appreciate being generous and nice to others.	
12	**Social Intelligence (emotional intelligence, personal intelligence)**	Socially competent people are aware of the motives and feelings of other people as well as themselves and they know what to do to fit into different social situations.	
13	**Teamwork (citizenship, social responsibility, loyalty)**	People with highly developed teamwork skills work well as a member of a group or team. They are loyal to the group and consider being a team member as a central factor.	
14	**Fairness**	Treating all people the same according to notions of fairness and justice is a central principle of fair people. They do not let personal feelings bias decisions about others and	

		give everyone a fair chance.	
15	**Leadership**	People with highly developed leadership encourage a group (of which one is a member) to get things done, while at the same time maintaining good relations within the group and treating everyone equally. They are able to organize group activities and see that they happen.	
16	**Forgiveness** & **mercy**	People with this strength have an easier time forgiving those who have done wrong. They give people a second chance. Being merciful and not being vengeful is their principle.	
17	**Modesty & Humility**	Modest people do not seek the spotlight and do not regard themselves as more special than they are. They let their accomplishments speak for themselves. Others	

		would describe them as modest and humble.	
18	**Prudence**	Prudent people think carefully about the consequences of their choice before acting. They do not say or do things that might later be regretted	
19	**Self-Regulation (self-control)**	People with a highly developed self-regulation are able to regulate what they feel and do. They are able to control different areas of life (appetite, emotions ect.) and are very disciplined.	
20	**Appreciation of Beauty and Excellence (awe, wonder, elevation)**	People with this strength notice and appreciate things. They are highly interested in beauty, excellence, and/or skilled performance in various domains of life (from nature to art to mathematics, to science, to everyday experience).	

21	**Gratitude**	Grateful people are aware of and thankful for the good things that happen to them. Others describe them as being grateful, because they always take time to express thanks	
22	**Hope (optimism, future-mindedness, future orientation)**	Optimistic people expect the best in the future; they believe that a good future is something that can be brought about. They hope for the best and work to achieve their goals.	
23	**Humor (playfulness)**	People with this strength like to laugh, tease and bring smiles to other people. They try to see the light side in various situations.	
24	**Religiousness & Spirituality (faith, purpose)**	Religious or spiritual people have coherent beliefs about the higher purpose and meaning of the universe. Their religious beliefs about the meaning of life shape their conduct and provide comfort and strength.	

Brief COPE

Dear participants,

This section of the research address the way in which you cope with your Chronic Illness. For this reason, the questions ask about the way you address particular challenges in light of having a Chronic Kidney Disease. Please answer the questions by filling in the answer as requested

Instructions

These items deal with ways you've been coping with the stress in your life since you found out you are a pre-dialysis or dialysis patient. There are many ways to try to deal with problems. These items ask what you've been doing to cope with this one. Obviously, different people deal with things in different ways, but I'm interested in how you've tried to deal with it. Each item says something about a particular way of coping. I want to know to what extent you've been doing what the item says. How much or how frequently. **Don't answer on the basis of whether it seems to be working or not—just whether or not you have been doing it within the past 4 weeks.** Use these response choices. Try to rate each item separately in your mind from the others. Make your answers as true FOR YOU as you can.

1 = I haven't been doing this at all
2 = I've been doing this a little bit
3 = I've been doing this a medium amount
4 = I've been doing this a lot

1. I've been turning to work or other activities to take my mind off things. _____
2. I've been concentrating my efforts on doing something about the situation I'm in. _____
3. I've been saying to myself "this isn't real.". _____
4. I've been using alcohol or other drugs to make myself feel better. _____
5. I've been getting emotional support from others. _____
6. I've been giving up trying to deal with it. _____

7. I've been taking action to try to make the situation better. _____
8. I've been refusing to believe that it has happened. _____
9. I've been saying things to let my unpleasant feelings escape. _____
10. I've been getting help and advice from other people. _____
11. I've been using alcohol or other drugs to help me get through it. _____
12. I've been trying to see it in a different light, to make it seem more positive. _____
13. I've been criticizing myself. _____
14. I've been trying to come up with a strategy about what to do. _____
15. I've been getting comfort and understanding from someone. _____
16. I've been giving up the attempt to cope. _____
17. I've been looking for something good in what is happening. _____
18. I've been making jokes about it. _____
19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping. _____
20. I've been accepting the reality of the fact that it has happened. _____
21. I've been expressing my negative feelings. _____
22. I've been trying to find comfort in my religion or spiritual beliefs. _____
23. I've been trying to get advice or help from other people about what to do. _____
24. I've been learning to live with it. _____
25. I've been thinking hard about what steps to take. _____
26. I've been blaming myself for things that happened. _____
27. I've been praying or meditating. _____
28. I've been making fun of the situation. _____

Dear Participant,

I sincerely thank you for taking the time and effort to complete this questionnaire. The information you have provided is truly valued. Your responses will play a key role in a Masters thesis and hopefully future intervention developments that caters to your holistic needs.

Sincerely,

Vandana Geerman