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Article

Does the Spiritual Well-Being of Chronic Hemodialysis Patients Differ from that of Pre-dialysis Chronic Kidney Disease Patients?

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Abstract: Spiritual well-being is viewed as an essential component of health-related quality of life (HRQOL) in the modernized biopsychosocial-spiritual model of health. Understanding spiritual well-being should lead to better treatment plans from the patients' point of view, and improved patient adherence. There are numerous studies of traditional HRQOL, physical, mental, and social well-being; however, studies of spiritual well-being in chronic kidney disease (CKD) patients are limited. Thus, this study compared spiritual well-being of chronic hemodialysis patients and pre-dialysis CKD patients. A total of 31 chronic hemodialysis and 63 pre-dialysis CKD patients were asked for consent and then interviewed for spiritual well-being using the Functional Assessment of Chronic Illness Therapy–Spiritual Well-Being (FACIT-Sp). Analysis of covariance was applied to compare FACIT-Sp scores between pre-dialysis CKD and chronic hemodialysis groups that were adjusted by patient characteristics. The FACIT-Sp scores of pre-dialysis CKD patients were non-significantly greater than those of chronic hemodialysis patients after adjustment for

gender, age, and marital status. However, all FACIT-Sp scores of males were significantly lower than those of females [FACIT Meaning −1.59 (p = 0.024), FACIT Peace −2.37 (p = 0.004), FACIT Faith −2.87 (p = 0.001), FACIT Total Score −6.83 (p = 0.001)]. The spiritual well-being did not significantly differ by stages of chronic kidney disease; however, patient gender was associated with spiritual well-being instead. To improve spiritual well-being, researchers should consider patient gender as a significant factor.

Keywords: spiritual well-being; quality of life (QOL); health-related quality of life (HRQOL); Functional Assessment of Chronic Illness Therapy – Spiritual Well-Being (FACIT-Sp); end-stage renal diseases (ESRD); chronic kidney disease (CKD); hemodialysis; pre-dialysis

1. Introduction

Since 1948, when the World Health Organization [1] defined *'health'* as *"a state of complete physical, mental, and social well-being and not merely the absence of disease infirmity"*, quality of life (QOL) and health related QOL (HRQOL), the more specific term, have been important issues in healthcare practice and research [2]. HRQOL is based on physical, mental, and social domains of health as perceived by the individual person [2]. There is evidence suggesting that spiritual and religious experiences also contribute to HRQOL, and are important for coping with illness [3]. The more traditional HRQOL domains, physical, mental, social well-being, have been expanded to cover spiritual well-being as another essential component, and this is the so called the biopsychosocial-spiritual model of health [4]. This model should help healthcare professionals concerning patients' spiritual well-being, especially those who are suffering from serious illnesses.

The definition of spirituality is still a debatable issue in that the term has no single and widely-agreed definitions [5,6]. Spirituality is considered to be a more wide-ranging and inclusive concept than religion, though their concept relationships are quite complex [6]. Based on an earlier literature review, the key components of spirituality were 'meaning', 'hope', 'relatedness/connectedness', and 'beliefs/beliefs systems' [5]. Büssing and Koenig also suggested the important of caring for spiritual, existential, and psychological needs of patients who are suffer from long-term chronic illnesses until the end of their lives [7]. They proposed the spiritual needs quantification model that included 'connection' (social dimension), 'peace' (emotional dimension), 'meaning/purpose' (existential dimension), and 'transcendence' (religious dimension) [7].

Chronic kidney disease (CKD) is defined as 'kidney damage or glomerular filtration rate (GFR) lower than 60 mL/min/1.73 m^2 for three months or longer. The worldwide prevalence of CKD is estimated to be within the range of 8–16% [8]. CKD patients experience life disturbances in many HRQOL areas including physical, sexual, social dysfunction, and mental problems such as depression, anxiety, pain, and sleep disturbance [9]. When patients reach a GFR of less than 15%, they are classified into the end-stage renal disease (ESRD) group. Most ESRD patients are treated with chronic dialysis leading to a dependency on healthcare professionals and dialysis machines. Moreover, they lose their normal lifestyle because of limitations of food, beverage intake, and normal activities [10–12].

HRQOL decline in CKD patients has long been recognized, and the deterioration is more pronounced with the progression of disease. Numerous studies have reported the better HRQOL of pre-dialysis CKD patients when compared with dialysis ESRD patients [13]. The associations of HRQOL and morbidity and mortality in dialysis patients are well-established, and this had led to the recommendation of routine HRQOL assessment in dialysis patients [9].

Research on the spirituality of CKD patients is however limited. Davison and Jhangri studied 253 CKD and dialysis patients and reported the prevalence of spiritual/existential needs in the range of 35–53%, with the highest need in 'finding hope' [14]. Their later study found that spirituality independently provided unique variances in HRQOL, and also associated with psychological adjustment to illness [15]. Spiritual care experiences of 10 nephrology nurses revealed that giving spiritual care led to a closer relationship between patients and nurse, nurses sensed the pain of patient spiritual distress, and giving spiritual care was much deeper than psychological [16]. A recent qualitative study of Thai CKD patients who lived in the United Stated showed that religion helped patients to cope with emotional stress [17]. Despite its importance, previous studies explored spirituality in western or Christian culture. This area has never been investigated in CKD patients in the Thai context.

A number of measures for spiritual well-being have been developed. The Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being Scale (FACIT-Sp) is commonly used and has been validated in a large sample of patients with serious illnesses (N = 1,617) [18]. It covers domains specified as important for spiritual well-being in chronic patients [18]. The strength is not only its rigorous validity and reliability tests, but also its applicability to a wide range of spiritual and religious traditions [4]. Recent study on spiritual well-being for Thai-Buddhist has defined three components involving 'having hope and sense of connectedness', 'understanding self and nature of life', and 'being happy' [19]. The measure is being developed but is still in its infancy. The majority of Thai people are Buddhist, and their spiritual well-being has been influenced by Thai-Buddhist beliefs which involve Kamma, merit making and reincarnation. Especially in a Thai context, however, their way of life and beliefs have also been associated with supernatural power, ghosts and spirits of Brahmist influence [19]. Therefore, a measure of spiritual well-being with wider coverage should be more applicable to the Thai population.

The objective of this present study was to compare the spiritual well-being of chronic hemodialysis patients and pre-dialysis CKD patients. As previous reports have suggested that disease progression leads to HRQOL deterioration, the study aim was to determine whether spiritual well-being would be different at different stages of disease progression. Such information should enhance the understanding of healthcare professionals and leading to a comprehensive and holistic care in this patient group.

2. Methods

This was a cross-sectional study using the structured questionnaire. The study sites were a community hospital and a medical school hospital in the northeast of Thailand. The protocol of study was approved by the Khon Kaen University Ethics Committee for Human Research.

Eligible patients were recruited between July 1, 2013 and December 31, 2013. Inclusion criteria for the pre-dialysis CKD were patients with GFR less than 15 mL/min/1.73 m^2 for three months or longer

who visited the nephrology out-patient clinic at one of the study hospitals. Eligibility for chronic hemodialysis patients were ESRD patients who were on chronic hemodialysis for three months or longer and were being treated at one of the study hospitals. The trained interviewers and research assistants invited each patient to participate in the study and written informed consent was obtained prior to data collection. Patients were interviewed in a private area of the nephrology out-patient clinic for pre-dialysis patients, and during the first two hours of a dialysis session for chronic hemodialysis patients. An interview method was used as it is more acceptable for the local people, many of whom were elderly, often unfamiliar with the reading, or uncomfortable to read due to limited education or poor eyesight. The trained interviewers administered the questionnaire by carefully reading the question and answer choices without interpretation, and then recorded the response to each question. Interview sessions lasted approximately 30 minutes.

The questionnaire consisted of patient demographic variables and the FACIT-Sp. The FACIT-Sp consists of 12 items that are classified into three factors: Meaning, Peace, and Faith [4]. The response choices for every item is a 5-point Likert-type scale (0 = Not at all; 1 = A little bit; 2 = Somewhat; 3 = Quite a bit; and 4 = Very much). The recall period of each question was seven days. The three domain scores and total scores were transformed according to the developer's guideline [4]. Scores were transformed into separate three domains: Meaning (FACIT Meaning), Peace (FACIT Peace), and Faith (FACIT Faith), and total scores (FACIT Total Scores). Higher scores reflect better spiritual well-being. The FACIT-Sp is a reliable and valid measure. The Cronbach's alpha of the FACIT-Sp was in range of 0.81 to 0.88. The validity of FACIT-Sp was examined by using concurrent spirituality measures, and moderate to strong correlation was found [4]. The Thai version of FACIT-Sp was translated and validated by Dr. Supalak Khemthong (with permission from Jason Bredle). The report of validity and reliability of FACIT-Sp Thai version has not been published. However, preliminary results indicated good validity and reliability (Cronbach's alpha = 0.80) [20].

Descriptive statistics were appropriately applied according to measurement levels and data distributions. To compare categorical variables between pre-dialysis CKD and chronic hemodialysis groups, chi-square test was applied; however, if the assumption of chi-square was not met, the Fisher's exact test was applied instead. For continuous numerical data, the independent t-test was used to compare between the two groups, if data were highly skewed, the Mann-Whitney U-test was used instead. Additionally, analysis of covariances (ANCOVA) were applied to compare the scores between the two groups that were adjusted by patient characteristics. The significance levels were set at 0.05 (2-sided tests) for all analyses.

3. Results

3.1. Patients' Characteristics

A total of 31 chronic hemodialysis and 63 pre-dialysis CKD patients were studied. Table 1 shows that the two patient groups significantly differed in all demographic factors. Almost four out of five pre-dialysis CKD patients were female (79.4%), while more than half of chronic hemodialysis patients were male (54.8%), and the gender difference between groups was significant ($p = 0.001$). Pre-dialysis CKD patients were significantly older than chronic hemodialysis patients (64.0 *versus* 54.5 years,

$p < 0.001$). Almost all of the chronic hemodialysis patients were married (87.1%), while just over half of pre-dialysis CKD patients were married (58.7%), and the marital status of two groups was significantly different ($p = 0.006$).

Table 1. Demographic data of pre-dialysis chronic kidney diseases (CKD) and chronic hemodialysis patients (N = 94).

	Pre-dialysis CKD (n = 63)		Chronic hemodialysis (n = 31)		*p*-value
	n	(%)	n	(%)	
Gender					
Female	50	(79.4%)	14	(45.2%)	0.001 *
Male	13	(20.6%)	17	(54.8%)	
Age (years) [Mean±SD]	64.0	±9.1	54.5	±10.2	<0.001 **
Marital status					
Single/ widow/ divorced	26	(41.3%)	4	(12.9%)	0.006 *
Married	37	(58.7%)	27	(87.1%)	

Notes: SD = standard deviation; * Chi-square test; ** Independent t-test.

3.2. Comparisons of FACIT-Sp Scores When Classified by Patient Demographic Characteristics

All FACIT-Sp scores (FACIT Meaning, FACIT Peace, FACIT Faith, and FACIT Total Scores) were highly skewed towards high spirituality scores, thus Mann-Whitney U-tests were used. Female patients had significantly better spiritual well-being than male when comparing all FACIT-Sp scores ($p < 0.001$). When classified into age-groups, patients above 60 years (elderly) and 60 years or lower, elderly patients had greater spiritual well-being scores than the younger patients in total scores and in two out of three domains (except FACIT Peace). Married patients had lower spiritual scores than other marital status, but scores were not significantly different (Table 2).

Table 2. Functional Assessment of Chronic Illness Therapy–Spiritual Well-Being (FACIT) domains and total scores by patient demographic characteristics.

	n	**FACIT Meaning ***		**FACIT Peace ***		**FACIT Faith ***		**FACIT Total Scores ****	
		Mean	**±SD**	**Mean**	**±SD**	**Mean**	**±SD**	**Mean**	**±SD**
Gender									
Male	30	11.17	±2.68	10.73	±3.89	10.50	±3.99	32.40	±9.38
Female	64	13.28	±3.11	13.75	±3.22	13.97	±3.26	41.0	±8.52
***p*-value *** **		**<0.001**		**<0.001**		**<0.001**		**<0.001**	
Age groups									
Age < 60 years	40	12.03	±2.89	12.08	±3.87	11.83	±4.17	35.93	±9.78
Age > 60 years	54	13.04	±3.25	13.31	±3.53	13.63	±3.42	39.98	±9.25
***p*-value *** **		**0.042**		0.070		**0.033**		**0.020**	
Marital status									
Married	64	12.30	±3.05	12.42	±3.72	12.58	±3.94	37.30	±9.71
Single/ widow/ divorced	30	13.27	±3.27	13.57	±3.63	13.47	±3.63	40.30	±9.31
***p*-value *** **		0.102		0.081		0.255		0.103	

Notes: SD = standard deviation; *score range 0–16; ** score range 0–48; *** Mann-Whitney U test.

3.3. Comparisons of FACIT-Sp Scores When Classified by Patient Treatment Groups: Results Adjusted by Patient Demographic Characteristics

All unadjusted FACIT-Sp scores of pre-dialysis CKD patients were significantly greater than those of chronic hemodialysis patients (Table 3). The pre-dialysis CKD patient group consisted of significantly more females, unmarried status and older patients than the chronic hemodialysis patient group. ANCOVA adjusting for gender, age, and marital status, was used to compare the scores of the pre-dialysis CKD and chronic hemodialysis groups. Based on unadjusted scores, the adjusted scores were slightly lower for pre-dialysis CKD patients, but slightly higher for chronic hemodialysis patients. All adjusted FACIT-Sp scores of pre-dialysis CKD patients were still greater than those of chronic hemodialysis patients, but they were not significant ($p > 0.05$). Controlling for covariate factors, gender was the only significant factor that affected all FACIT-Sp scores. The demographic variables, age and marital status, were non-significant in ANCOVA of all FACIT-Sp scores, however analysis of results revealed a similar trend as previously analyzed by using Mann-Whitney U-test. In conclusion, spiritual well-being FACIT-Sp scores of pre-dialysis CKD patients were not significantly greater than those of chronic hemodialysis patients after being adjusted for gender, age, and marital status. Among study demographic variables, gender was the most influential factor for spiritual well-being in the study patients.

Table 3. Analysis of covariances of Functional Assessment of Chronic Illness Therapy – Spiritual Well-Being (FACIT) domain and total scores as the dependent variables by patient treatment groups and covariates.

Dependent Variables	**FACIT Meaning ***	**FACIT Peace ***	**FACIT Faith ***	**FACIT Total Scores ****
Main Factor and Covariates				
Main factor				
Unadjusted mean (95% CI)				
Pre-dialysis CKD	13.25 (12.51, 14.00)	13.67 (12.80, 14.53)	13.68 (12.78, 14.58)	40.60 (38.41, 42.80)
Chronic hemodialysis	11.29 (10.16, 12.42)	11.00 (9.65, 12.35)	11.19 (9.77, 12.62)	33.48 (29.90, 37.07)
Adjusted mean (95% CI)				
Pre-dialysis CKD	12.95 (12.12, 13.73)	13.32 (12.14, 14.23)	13.15 (12.23, 14.08)	39.42 (37.12, 41.73)
Chronic hemodialysis	11.92 (10.73, 13.10)	11.70 (10.33, 13.07)	12.27 (10.88, 13.66)	35.88 (32.40, 39.36)
Pre-dialysis CKD versus chronic hemodialysis score differences (95% CI)	1.03 (−0.50, 2.56)	1.63 (−0.14, 3.39)	0.89 (−0.90, 2.68)	3.55 (−0.93, 8.02)
p-value	0.183	0.070	0.327	0.119

Table 3. *Cont.*

Dependent Variables	FACIT Meaning *	FACIT Peace *	FACIT Faith *	FACIT Total Scores **
Main Factor and Covariates				
Covariates:				
Parameter estimates				
(95% CI)				
Age (years)	0.03	0.01	0.06	0.10
	(−0.04, 0.09)	(−0.06, 0.09)	(−0.02, 0.14)	(−0.09, 0.29)
***p*-value**	0.397	0.774	0.119	0.304
Male versus female score	**−1.59**	**−2.37**	**−2.87**	**−6.83**
differences (95% CI)	**(−2.98, −0.21)**	**(−3.96, −0.77)**	**(−4.49, −1.25)**	**(−10.87, −2.78)**
***p*-value**	**0.024**	**0.004**	**0.001**	**0.001**
Married versus other marital				
status score differences (95%	−0.45	−0.45	−0.19	−1.09
CI)	(−1.80, 0.91)	(−2.01, 1.11)	(−1.77, 1.40)	(−5.05, 2.87)
***p*-value**	0.513	0.566	0.814	0.587

Notes: 95% CI = 95% Confident Interval; CKD=chronic kidney disease; * score range 0–16; ** score range 0–48.

4. Discussion

This study was conducted to test whether spiritual well-being of patients with different disease stages would differ as previously reported in HRQOL. Spiritual well-being is considered to be an important part of QOL, but it is distinct from traditional HRQOL, physical, mental, and social well-being [4]. Thus, spiritual well-being may or may not be influenced by disease stages in the same way as QOL. Though unadjusted comparison analyses of spiritual well-being scores between pre-dialysis CKD and chronic hemodialysis patients revealed significant differences, these results may be due to influencing factors of different patient characteristics. Since gender and age of patients were also associated with spiritual well-being, and these factors significantly differed across the two treatment groups, analyses should therefore account for these differences. With ANCOVA analysis, gender was the only significant factor that was associated with all spiritual well-being FACIT-Sp scores, instead of treatment groups. Thus the effect of gender on spiritual well-being was more pronounced than that of disease stages in ESRD patients.

The association of gender and spirituality was also reported in the study of Kao *et al.* in Taiwanese hemodialysis patients. They found that the proportion of male patients with strong spiritual beliefs (34.6%) was significant smaller than those of male patients with none (52.8%) or weak (47.5%) spiritual beliefs ($p = 0.005$) [21]. Additionally, the study of Reig-Ferrer *et al.* in Spanish hemodialysis patients reported in the association of religiosity and gender that female hemodialysis patients tended to be more spiritual and religious than male hemodialysis patients (percentages of very religious; female 36.4% *vs.* male 6.6%, $p < 0.001$) [22]. The phenomenon of more religiousness and spirituality in women was reconfirmed in this study. Non-significant effect of disease stages on spirituality were revealed by this study, while previous evidence reported lower HRQOL in hemodialysis patients than CKD patients [13]. An explanation of this phenomenon might be that HRQOL measures aspects of

daily living such that physical, mental, and social well-being, while spiritual well-being measures aspects of inner peace and beliefs. Since this was a cross-sectional study, it did not take into account patients' adaptations to the chronic disease situation. As the effect of disease stage on daily living distress occurs and is long lasting, a patient might learn to cope with the disease and spirituality by a number of methods [23], which may result in response shift on the spiritual well-being scores, or else, the disease might not even change their spiritual well-being.

This study added to the evidence of gender difference in spiritual well-being after controlling for age, marital status, and different stages of chronic renal diseases. However, the limitations of this study were the small number of patients. There is an imbalance of gender distribution with more male in the chronic hemodialysis group, and more female in the pre-dialysis CKD group. Nevertheless, the gender difference was expected in our setting. The Renal Replacement Therapy Registry of Thailand Year 2011 reported 52.6% male in chronic hemodialysis patients [24] which is similar to 54.8% reported in this study. The gender distribution of pre-dialysis CKD patients also reflects population in the setting, and as women generally take better care of themselves, it is common to have more females in this early stage of disease. Nevertheless, the interpretation of the results should take into consideration the skewed gender distribution in pre-dialysis CKD patients. In addition, study variables were limited to only a few demographic characteristics, and thus other important variables such as laboratory measures, HRQOL, and social support should be considered in future research. It should be noted that Kao *et al.* found weak spiritual beliefs in less-educated hemodialysis patients [21].

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Author Contributions

AC is PI of the study, designed the study and developed the proposal for approval by the ethic committee, analyzed the data using statistical methods, and drafted the manuscript. DC and WS interviewed patients, and helped draft the manuscript. NPJ contributed on revising the final draft manuscript. The final manuscript was approved by all authors.

Abbreviations

QOL: quality of life;
HRQOL: health-related quality of life;
FACIT-Sp: Functional Assessment of Chronic Illness Therapy – Spiritual Well-Being;
GFR: glomerular filtration rate;
ESRD: end-stage renal disease;

CKD: chronic kidney disease;
ANCOVA; analysis of covariance.

Conflicts of Interest

The authors declare no conflict of interest.

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