



Examining social support, psychological status, and health-related quality of life in people receiving haemodialysis

Van Lan Hoang PhD, MN, BN, RN^{1,2}  | Theresa Green PhD, RN^{3,4} |
Ann Bonner PhD, MA, BAppSc (Nurs), RN^{1,5,6} 

¹School of Nursing, Queensland University of Technology, Brisbane, Australia

²College of Health Sciences, VinUniversity, Hanoi, Vietnam

³School of Nursing and Midwifery, University of Queensland, Brisbane, Australia

⁴Surgical Treatment and Rehabilitation Service, Metro North Hospital and Health Service, Brisbane, Australia

⁵School of Nursing and Midwifery, Griffith University, Brisbane, Australia

⁶Kidney Health Service, Metro North Hospital and Health Service, Brisbane, Australia

Correspondence

Van Lan Hoang, College of Health Sciences, VinUniversity, Hanoi, Vietnam.
Email: lan.hoang@hdr.qut.edu.au and van.hl@vinuni.edu.vn

Abstract

Background: Being on haemodialysis can lead to many burdens on patients' lives. Social support for patients is crucial; however, whether social support affects health outcomes including both depression, anxiety and health-related quality of life is not well understood.

Objectives: To explore the relationship between social support, psychological status, and health-related quality of life of people undergoing haemodialysis.

Design: A cross-sectional study.

Participants: Convenience sampling recruited 388 patients from one dialysis centre.

Measurements: Survey data collected included demographic and clinical data, the Medical Outcomes Social Support Survey, Depression Anxiety Stress Scales, and Short-Form Health Survey 36. Multiple linear regression was used to determine the direct and mediation effects of social support on health outcomes.

Results: Participants' ages ranged from 19 to 84 years and most had undergone haemodialysis for more than 5 years (53.2%). Overall, there was a moderate level of social support, and although tangible support was high, emotional-oriented support functions were missing. Participants reported a high level of anxiety, moderate levels of depression, mild levels of stress, and impaired physical and mental health. Greater social support independently and positively affected mental health, and also reduced the negative influences of depression on the mental health component but not the physical health component. Social support, depression, anxiety and participation in social groups explained 48% of the variance in mental health.

Conclusions: People undergoing haemodialysis require both tangible and emotional social support. When there is enough social support, there are positive effects on reducing depression and improving mental, but not physical health.

KEYWORDS

depression, end-stage kidney disease, haemodialysis, health-related quality of life, social support

INTRODUCTION

Haemodialysis is an effective life-sustaining treatment for people with kidney failure, although it may cause considerable physical, social and financial burdens (Bonner et al., 2010; Gerogianni & Babatsikou, 2013). Social support, typically provided by family members and friends (Alexopoulou et al., 2016), is essential in helping people with kidney failure who are receiving haemodialysis to cope with the disease and treatment burdens (Liyanage et al., 2015). Research has shown that social support could contribute to health improvement through several pathways, including improving psychosocial aspects of life, health-related quality of life (HRQoL), and reducing mortality (Harandi et al., 2017; Kim & Thomas, 2017; Uchino et al., 2018). However, there is limited understanding about the influence of social support on health in those receiving haemodialysis.

In Vietnam, social support provided for people receiving haemodialysis is from both formal and informal sources. Formal support from governmental services is limited and is primarily provided by the public healthcare insurance (PHI) policies (i.e., the majority of the population are covered for up to 80% of medical expenses; Vietnamese National Assembly, 2014). Welfare support is only provided to those declared extremely poor with a monthly income of less than 1,300,000 Vietnamese Dongs (approximately €47 Euros). Family members provide informal support at home and also in the hospital. For example, basic activities of daily living (e.g., washing the patient) and the provision of all meals is provided by family members. Families do have a primary role in caring for people with kidney failure (Hoang et al., 2019).

LITERATURE REVIEW

Perceived functional social support, refers to the belief individuals have that their support needs are fulfilled, and that assistance from others is available for them (Shor et al., 2013). Social support functions often include tangible support, emotional support, informational support, and positive social interaction or socialising (Schaffer, 2009). In examining those on haemodialysis and how they perceive the social support provided to them, some researchers have reported that medium to high levels of social support was perceived to be available (Khalil & Abed, 2014; Liu et al., 2017; Plantinga et al., 2010) whereas other researchers have found the opposite (Kara et al., 2007; Kirchgessner et al., 2006). Nevertheless, family, friends, and close others (i.e., informal caregivers) were identified as the most crucial sources of support for those having haemodialysis (Hoang et al., 2018). Social support from others is also important for mental health and well-being. In those with kidney failure requiring dialysis, both depression and anxiety are commonly experienced (Almutary et al., 2016) but in those with higher levels of social support, depression or anxiety do seem to be lower (Liu et al., 2017).

Neumann et al. (2018) found that when individuals perceive more availability of support from close and satisfying relationships, they will have higher levels of mental-health aspects of HRQoL. While the beneficial impact of support from family and friends/close

persons on depression, anxiety and HRQoL in patients with kidney failure has been studied (Hoang et al., 2019), little is known about the effects of support functions (e.g., tangible or emotional support) on both psychological status and HRQoL for those receiving haemodialysis. This study sought to understand the effects of functional aspects of social support on people undergoing haemodialysis by examining the relationships between social support, their psychological status (i.e., depression, anxiety and stress), and HRQoL.

METHODS

Design

A cross-sectional observational study.

Setting

The study setting was a large dialysis department in a major tertiary hospital in Hanoi, Vietnam. This hospital is a national-level (highest level) hospital and one of the largest in the country. The hospital provides healthcare services for about 4000 inpatients and 6000 outpatients daily with different illnesses and conditions to people living in Hanoi (the capital of Vietnam) and also the northern region of the country. The dialysis department is one of the largest dialysis centres in Vietnam with approximately 600 patients receiving long-term haemodialysis treatment. The majority of patients have PHI; however, this insurance only covers low-flux dialysers reused six times (Hyodo et al., 2017).

Participants

A convenience sampling method was used to recruit adults aged 18 years or older, who had undergone haemodialysis for a minimum of 3 months, were able to communicate in the Vietnamese language and were willing to participate. Exclusion criteria were cognitive impairment or being acutely unwell as determined and reported by medical physicians.

A sample size of 300 was calculated based on the number of predictor variables for multiple regression modelling, using the ratio of 10 participants per predictor (i.e., 10 participants multiplied by the number of independent variables; Tabachnick & Fidell, 2013). Considering a possible nonresponse of 25%, we inflated the sample size to 400 participants for this study. The study took place between December 2017 and March 2018.

Measures

A demographic questionnaire and three patient-reported outcome measures (Medical Outcomes Study Social Support Survey [MOS-SSS], Depression Anxiety Stress Scale-21 items [DASS21] and Short-

Form Health Survey 36 items-version 2 [SF36v2]) were used. Demographic characteristics were age, gender; marital, educational, employment and monthly income status; duration of having haemodialysis; cause of kidney failure; comorbidities; and participation in social groups (e.g., women union or local elderly groups). Participants took about 20–30 min to complete all questionnaires.

The MOS-SSS is a self-administered instrument comprised of 19 items divided into four subscales measuring types of functional support: tangible, affectionate, emotional/informational, and positive social interaction (Sherbourne & Stewart, 1991). For each item, participants were asked to indicate how often each type of support was available to them using a 5-point Likert scale (none of the time [1] to all of the time [5]). Higher scores indicate higher levels of social support. The total MOS-SSS and subscale scores were transformed to a 0–100 scale. The MOS-SSS has been used in the CKD population in several studies (Plantinga et al., 2010; Thomas & Washington, 2012). The Vietnamese version of MOS-SSS has been previously used in a study of people with cardiovascular disease (Dao Tran, 2017). In this study, the MOS-SSS had high reliability with a Cronbach's α of 0.95.

The 21-item DASS scale measures self-reported depression, anxiety and stress. Each is a subscale comprising seven items. Items are rated using a 4-point Likert scale (from 0—'Did not apply to me at all' to 3—'Applied to me very much, or most of the time'; Lovibond & Lovibond, 1995). The total score of the instrument is then doubled to be able to compare with the original 42 item DASS. The clinical cut-off values differentiating normal from having abnormal were 10 for depression, 8 for anxiety and 15 for stress (Lovibond & Lovibond, 1995). The instrument has previously been used in a study in Vietnam of people with end-stage kidney disease (ESKD) receiving haemodialysis (Bonner et al., 2015). The Vietnamese version of DASS-21 (Tran et al., 2013) has good internal consistency with Cronbach's α of 0.82 (depression), 0.76 (anxiety) and 0.82 (stress) in the current study.

The SF36v2 is a self-administered instrument consisting of eight subscales to assess overall health status (Ware, 2000). The instrument is divided into two summary measures; the physical component summary (PCS) and the mental component summary (MCS; Ware, 2000). The instrument items are rated using the Likert method, then all scores are calculated for each health domain (i.e., subscale) as guided by the user's manual for the instrument (Maruish, 2011). The total score of the instrument ranges from 0 to 100, with higher scores indicating better HRQoL. The SF36v2 has been used in the CKD population in Vietnam (Bonner et al., 2015). The Vietnamese version of the SF36v2 has acceptable reliability, with Cronbach's alpha coefficients for the subscales ranging from 0.67 to 0.89 (Ngo-Metzger et al., 2008). In this study, the scale reliabilities ranged from 0.74 to 0.89 for most of the health domain scales, except for the general health domain (0.67).

Data analysis

Data analyses were carried out using IBM SPSS Statistics version 25.0 and AMOS version 25 (IBM Corp., 2017). Missing data for each

demographic variable and questionnaire was found to be less than 2.5%, thus multiple data imputation was applied (Schlomer et al., 2010). Mean (*M*), standard deviation (*SD*), median, minimum and maximum were calculate for age, duration on haemodialysis, social support, depression, anxiety, stress and each SF36v2 health domain as well as PCS and MCS scores. Categorical variables were expressed by count numbers and percentage. Normality testing for each variable was assessed using histograms, normal Q–Q plots, and skewness and kurtosis values which showed no severe problem of normal distribution in all continuous variables. Independent *t*-test and one-way analysis of variance were used to evaluate the differences between variables.

The relationships among social support, depression, anxiety, stress and HRQoL were tested using multiple linear regression analysis. In the first step, based on the clinical importance and statistical significance of the bivariate associations, participant characteristics (age, employment, time on dialysis, comorbidities and participation in social group) were selected to include in the models. Then, depression, anxiety and stress were entered in Step 2. Social support was added at the final step. Statistical significance was set at $p < 0.05$ and 95% confidence intervals (95% CIs) were calculated where appropriate. Mediation effects of social support on the relationships between depression, anxiety, stress and HRQoL were evaluated with multiple regression models using bootstrapping to determine the significance of the indirect effects (Hayes, 2018). The number of random samples used for the bootstrap estimates was set to 10,000. Indirect effects (mediation effects) were identified as significant when the 95% bootstrap CI of an effect did not include zero (Hayes, 2018). This test was conducted using the bootstrapping module of AMOS version 25 (IBM Corp., 2017).

Ethical consideration

The study was approved by Ethical Review Committees in (de-identified for review) before any study procedures being undertaken. Participants were provided with an information sheet, a verbal explanation of the study and gave consent to participate in the study.

RESULTS

Participant characteristics

A total of 449 patients were eligible for the study although 49 refused to participate, and 12 incomplete questionnaires were returned resulting in 388 participants. Of the participants, 51.5% ($n = 200$) were women. The mean age was 49.1 ($SD = 14.1$) years, ranging from 19 to 84 years of age. Most were married ($n = 288$, 74.2%), had finished nine years of education ($n = 200$, 51.5%), over half were unemployed or retired ($n = 227$, 58.5%), and had an average monthly income less than EUR €57 ($n = 233$, 58.5%). Participants had spent an average of 72 months (i.e., 6 years) on haemodialysis

TABLE 1 Patient characteristics

Characteristics	Numbers (%)
Gender	
Men	188 (48.5)
Women	200 (51.5)
Age	
Range: 19.00–84.00	
M = 49.1, SD = 14.1	
18–3	46 (11.9)
31–45	121 (31.3)
46–60	124 (32.0)
60+	96 (24.8)
Marital status	
Married/de facto	298 (76.8)
Single/divorced/widowed	90 (23.2)
Highest education level	
No formal education	4 (1.0)
Primary school or lower (≤ 9 years of education)	39 (10.1)
Secondary school (≤ 9 years of education)	145 (37.4)
High school (> 9 years of education)	105 (27.1)
Higher education (diploma/undergraduate or higher)	95 (24.4)
Employment status	
Employed	110 (28.4)
Unemployed	139 (35.8)
Homemakers	51 (13.1)
Retired	88 (22.7)
Income per month	
Less than EUR €57	233 (58.5)
EUR €57–<EUR €107	50 (13.2)
EUR €107–<EUR €214	70 (18.5)
EUR €214–<EUR €322	21 (5.5)
EUR €322–EUR €715+	15 (4.0)
Time on haemodialysis	
Range: 3.00 months–22 years	
Median = 72.00 months (6 years); IQR = 35.62–117.14	
≤ 12 months	51 (13.1)
> 1 – ≤ 3 years	64 (16.5)
> 3 – ≤ 5 years	66 (17.0)
> 5 –<10 years	111 (28.6)
≥ 10 years	96 (24.7)

(Continues)

TABLE 1 (Continued)

Characteristics	Numbers (%)
Cause of ESKD	
Glomerulonephritis	199 (51.3)
Unknown	108 (27.8)
Diabetes mellitus	21 (5.4)
Hypertension	17 (4.4)
Others	43 (11.1)
Comorbidities	
None	73 (18.8)
1 Disease	186 (47.9)
≥ 2 Diseases	129 (33.2)
Hypertension	185 (47.7)
Cardiovascular diseases	103 (26.6)
Musculoskeletal diseases	31 (7.9)
Diabetes	28 (7.2)
Social groups involvement	
No	325 (83.8)
Yes	63 (16.2)

Abbreviations: ESKD, end-stage kidney disease; IQR, interquartile range; M, mean; SD, standard deviation.

(median = 72 months, IQR = 35.62–117.14), and most had comorbidities ($n = 315$, 81.2%), of which hypertension was predominant (see Table 1).

Social support

The average social support score was 58.6 ($SD = 22.3$), indicating a moderate level of support perceived by participants (Table 2). Of the four support functions, only tangible support was rated at a high level ($M = 76.86$, $SD = 21.76$), while the other functional support scores ranged from 52.22 ($SD = 27.33$; positive social interaction) to 54.86 ($SD = 27.49$; affectionate support; see Table 2). Noticeably, around a quarter of the participants in this study reported having no one to hug them (Item 9; 24.2%, $n = 93$). One-fifth of them felt they rarely could find someone who they could talk with (Item 2; 20.8%, $n = 80$) or who could give information to help them understand a treatment and health situation (Item 7; 20.5%, $n = 79$; see Table S1). Women were more likely to have better emotional and information support than males ($p < 0.05$); however, no significant difference regarding overall social support was reported according to gender. Table S2 provides other associations between demographic characteristics and social support).

TABLE 2 Descriptive statistics for patients' social support, depression, anxiety, stress and health-related quality of life

Variable	M	SD	Median	α	Range	
					Potential	Actual
MOSSS						
Overall social support	58.60	22.30	59.87	0.95	0–100	0–100
Emotional/informational support	54.54	24.82	53.12	0.91	0–100	0–100
Tangible support	76.86	21.76	81.25	0.82	0–100	0–100
Positive social interaction support	52.22	27.33	50.00	0.81	0–100	0–100
Affectionate support	54.86	27.49	50.00	0.82	0–100	0–100
DASS-21						
Depression	13.85	9.54	12.00	0.82	0–42	0–42
Anxiety	14.66	9.20	14.00	0.76	0–42	0–38
Stress	15.58	10.07	14.00	0.82	0–42	0–42
HRQoL (SF-36v2)						
Physical health component						
Physical functioning	37.22	8.63	36.79	0.89	0–100	16.5–58.9
Role-physical	41.23	9.93	42.23	0.89	0–100	19.2–57.5
Bodily pain	35.03	9.79	32.46	0.89	0–100	21.2–57.1
General health	42.26	11.42	40.83	0.88	0–100	21.6–62.0
Mental health component						
Vitality	29.83	8.67	27.46	0.67	0–100	18.9–65.1
Social functioning	39.96	10.42	40.09	0.88	0–100	12.0–66.0
Role-emotional	38.91	9.82	37.74	0.74	0–100	22.8–70.4
Mental health	36.62	12.44	37.29	0.83	0–100	17.2–57.3
	37.53	11.63	37.02	0.89	0–100	14.3–56.1
	43.12	11.22	43.02	0.78	0–100	14.2–63.9

Abbreviations: α , Cronbach's alpha; DASS-21, Depression Anxiety Stress Scales 21 Items; HRQoL, health-related quality of life; M, mean; MOSSS, medical outcome study social support scale; SD, standard deviation; SF-36V2, Short-Form Survey 36 Items-Version 2.

Depression, anxiety and stress

Participants in this study experienced moderate depression ($M = 13.85$, $SD = 9.54$; cut-off points from 14 to 20), severe anxiety ($M = 14.66$, $SD = 9.2$; cut-off points from 15 to 19), and mild stress ($M = 15.58$, $SD = 10.07$; cut-off points from 15 to 18; see Table X). The prevalence of abnormal depression, anxiety, and stress scores was 65.5%, 77.1% and 48.7%, respectively (see Table S4). Women were more likely to experience greater anxiety and stress than males ($p < 0.01$), and age was positively correlated with depression ($r = 0.151$, $p < 0.01$; see details in Table S3).

Health-related quality of life

Table 2 shows that both PCS and MCS scores were lower than the normative score of 50 recommended (Maruish, 2011). Of the eight health domains, general health had the lowest score ($M = 29.83$, $SD = 8.67$), while the mental health domain had the highest score ($M = 43.12$, $SD = 11.22$; see Table 2). Age was negatively correlated with PCS ($r = -0.367$, $p < 0.01$). Participants who were married, had

over 9 years of education, were employed, or had a higher income reported better PCS and MCS ($p < 0.01$; see Table S3).

Relationships between social support, psychological status and HRQoL

The results of multiple linear regression analysis of social support, psychological status and demographic characteristics with physical HRQoL are presented in Table 3. In the first step, the five demographic variables accounted for 26% of physical health variance. Those who were older or spent longer time on haemodialysis reported significantly lower PCS scores ($B = -0.15$, 95% CI: $[-0.21; -0.09]$, $p < 0.01$ and $B = -0.03$, 95% CI: $[-0.04; -0.01]$, $p < 0.01$, respectively). However, those who were employed or actively participated in social groups had significantly higher PCS ($B = 3.66$, 95% CI: $[1.86; 5.47]$, $p < 0.01$ and $B = 4.04$, 95% CI $[2.06; 6.02]$, $p < 0.01$, respectively). In the second step, depression, anxiety, stress and demographic characteristics accounted for 33% of the variance of PCS ($R^2 = 0.327$, $F = 21.06$, $p < 0.01$), with significant direct effects of depression and

TABLE 3 Multiple linear regression analyses predicting physical-related quality of life

Predictor	Physical health				
	Model 2 R ² change	B	95% CI	Model 3 B	95% CI
Step 1	0.255**				
Age		-0.150**	[-0.214, -0.086]	-0.150**	[-0.214, -0.090]
Time on haemodialysis		-0.030**	[-0.040, -0.0130]	-0.030**	[-0.040, -0.013]
Employed		3.660**	[1.860, 5.470]	3.620**	[1.820, 5.420]
Having comorbidities		-1.450	[-3.390, 0.490]	-1.290	[-3.260, 0.670]
Participation in social groups		4.040**	[2.060, 6.020]	3.910**	[1.930, 5.890]
Step 2	0.072**				
Depression		-0.360*	[-0.650, -0.160]	-0.380*	[-0.640, -0.140]
Anxiety		-0.320*	[-0.560, -0.110]	-0.330*	[-0.550, -0.110]
Stress		0.120	[-0.100, 0.390]	0.120	[-0.120, 0.370]
Step 3	0.006				
Social support				-0.040	[-0.090, 0.002]
Total R ²		0.327		0.333	
Total ΔR ²		0.313		0.317	
Total F		22.705**		19.29**	

Note: N = 383.

Abbreviations: B, unstandardised coefficient; CI, confident interval.

* $p < 0.05$; ** $p < 0.01$.

anxiety. When depression and anxiety was increased, PCS score decreased ($B = -0.36$, 95% CI: [-0.65, -0.16], $p < 0.05$) and $B = -0.32$, 95% CI: [-0.56, -0.11], $p < 0.05$, respectively). In the third step, the addition of total perceived social support did not increase the explained variance (R^2 change = 0.007, $p > 0.05$), and did not significantly predict physical health, indicating that social support did not have a direct effect on physical health or a mediation effect on the relationship between depression/anxiety and physical health.

Table 4 also demonstrates the results of the multiple linear regression analysis of demographic characteristics, social support, and psychological states with mental health. In the first step, demographic characteristics accounted for only 3% of the variance and only participation in social groups significantly and positively predicted mental health ($B = 2.98$, 95% CI: [0.8; 5.15], $p < 0.01$). In the second step, depression, anxiety and stress were added and together with participant characteristics, accounted for 46% of the variance of MCS ($R^2 = 0.446$, $F = 37.61$, $p < 0.01$), with significant direct and negative effects of depression, anxiety and stress. Depression was the strongest predictor of mental health ($B = -0.82$, 95% CI: [-1.08, -0.55], $p < 0.01$), followed by anxiety ($B = -0.49$, 95% CI: [-0.73, -0.24], $p < 0.01$). Model 3 indicates that the introduction of social support increased the explained variance of mental health to 48% ($R^2 = 0.48$, $F = 38.28$, $p < 0.01$). Table 5 presents the effects of social support on

depression, anxiety and HRQoL. We found that only social support significantly reduced depression ($\beta = -0.19$, 95% CI: [-0.35; -0.02], $p < 0.05$). As the bootstrap statistical method uses 10,000 random samples to estimate coefficients of indirect effects and standard errors, indirect effects were considered significant when the 95% bootstrap confidence interval did not include zero. This analysis confirmed that social support had a partial mediation effect on depression which in turn affected mental health components of HRQoL ($\beta = -0.09$, 95% CI: [-0.19; -0.02]).

DISCUSSION

Regardless of age or gender, participants in this study perceived that moderate social support was provided to them and that tangible support was predominant. Tangible support includes practical supportive activities, such as assisting with personal care, travel to hospitals and daily chores. Most of the participants in this study were married and lived with family members that might explain the high level of tangible support perceived. Family members are the main support providers for Vietnamese people, including for those receiving haemodialysis (Hoang et al., 2019). This study also found that participants with a higher level of education reported greater social support. In Vietnam, people with better education tend to have better-paid positions (Le, 2018); thus, education and better financial

TABLE 4 Multiple linear regression analyses predicting mental-related quality of life

Predictor	Mental health			Model 3	
	Model 2 R ² change	B	95% CI	B	95% CI
Step 1	0.032*				
Age		0.04	[-0.02, 0.11]	0.04	[-0.02, 0.11]
Time on haemodialysis		0.001	[-0.01, 0.02]	0.000	[-0.01, 0.02]
Employed		0.25	[-1.73, 2.23]	0.37	[-1.73, 2.23]
Having comorbidities		-0.07	[-2.19, 2.05]	-0.04	[-2.02, 2.10]
Participation in social groups		2.98**	[0.83, 5.15]	2.23*	[0.12, 4.34]
Step 2	0.43**				
Depression		-0.82**	[-1.08, -0.55]	-0.73**	[-0.99, -0.46]
Anxiety		-0.49**	[-0.73, -0.24]	-0.48**	[-0.71, -0.24]
Stress		-0.29*	[-0.56, -0.03]	-0.31*	[-0.57, -0.06]
Step 3	0.034**				
Social support				0.12**	[0.07, 0.17]
Total R ²		0.446		0.48	
Total ΔR ²		0.434		0.467	
Total F		37.61**		38.28**	

Note: N = 383.

Abbreviations: B, unstandardised coefficient; CI, confident interval.

p* < 0.05.; *p* < 0.01.

TABLE 5 Mediation effects of social support on the impact of psychological distress and health-related quality of life

	Total effect			Indirect effect		
	β	SE	95% CI	β	SE	95% CI
Physical health						
Depression	-0.32**	0.08	-0.47, -0.16	0.014	0.11	-0.001, 0.04
Anxiety	-0.19*	0.07	-0.34, -0.06	0.002	0.01	-0.01, 0.02
Stress	-0.11	0.07	-0.04, 0.24	-0.001	0.01	-0.02, 0.01
Social support	-0.07	0.05	-0.16, 0.01			
Mental health						
Depression	-0.38**	0.06	-0.49, -0.25	-0.09	0.04	-0.19, -0.02
Anxiety	-0.23**	0.06	-0.34, -0.11	-0.01	0.03	-0.09, 0.05
Stress	-0.13*	0.07	-0.28, -0.01	0.003	0.03	-0.07, 0.08
Social support	0.21**	0.04	0.12, 0.29			
Social support						
Depression	-0.19*	0.08	-0.35, -0.02	-	-	-
Anxiety	-0.02	0.07	-0.17, 0.12	-	-	-
Stress	0.01	0.08	-0.16, 0.17	-	-	-

Abbreviations: B, standardised coefficient; CI, confidence interval; SE, standardised error.

p* < 0.05.; *p* < 0.01.

security could lead to greater opportunities to have free time to engage in social interactions, and this could have influenced this result.

Having social support had a significant direct and positive effect on mental health. Given the MOS-SSS assesses three emotional-oriented support functions (i.e., emotional, affectionate and social interaction support) and only one practical-oriented support function (i.e., tangible support), this might explain why social support functions demonstrated this effect on mental rather than physical health. Previous studies in kidney failure patients requiring dialysis have focused on examining the relationships between social support and either depression or anxiety (Lilympaki et al., 2016; Liu et al., 2017), or HRQoL (Kang et al., 2016; Tien et al., 2017). Few studies have reported the effects of social support from different support sources (e.g., family, friends) on depression and HRQoL (Khalil & Abed 2014; Pan et al., 2019). The current study demonstrated strong links between perceived social support functions and depression or anxiety or stress and HRQoL in a specific haemodialysis population, which provides further evidence that interventions designed to improve social support of participants are required.

Depression, anxiety and stress were problematic despite the moderate levels of social support perceived by the participants in our study. These results are consistent with previous studies in the haemodialysis population (Liu et al., 2018; Lilympaki et al., 2016). It has also been shown that frequent alarms from haemodialysis machines, staying connected to the machines for hours each week, hospital visits every 2 or 3 days, transportation to the hospital, and diet/fluid restrictions are likely to contribute to substantial anxiety (Feroze et al., 2012; Kopple et al., 2017). The financial burden in low-middle income countries like Vietnam adds further pressure on patients and their families as they struggle to avoid financial ruin, treatment discontinuation and death (Hyodo et al., 2017; Stanifer et al., 2016). In Vietnam, the cost of haemodialysis treatment is high (€4508 Euros per year) while the average income is about €1868 Euros per year (World Bank 2017), and although PHI is provided to everyone, it is not 100% coverage (Vietnamese National Assembly, 2014). Consequently, people on haemodialysis have to rely on their family members to support their treatment practically, emotionally, and financially.

This study found that depression increased as age increased. Previous studies have shown different results regarding the association between depression and age in this population. Some studies have found that older age was associated with higher levels of depression (Gerogianni et al., 2018; Park et al., 2010; Teles et al., 2014) while others have found no associations (Goh & Griva, 2018; Semaan et al., 2018). In this study, older participants had decreased physical health and this might have contributed to higher levels of depression. Low levels of physical health and well-being might have also resulted in less social activities, decreased social relationships and increased social isolation (Stasiak et al., 2014).

Participants in this study had lower levels of both physical and mental health aspects of HRQoL. Lower HRQoL in the ESKD population has been widely reported and is believed to be due to not only the disease but also to the increased effects of being on haemodialysis (Bai et al., 2019; Kang et al., 2016). In this study, most

participants were of working age, and being on haemodialysis at this time of life, meant there were significant changes to life plans (Dąbrowska-Bender et al., 2018). The time and physical strength required for patients to juggle treatment and work schedules made employment particularly difficult. Along with symptoms such as fatigue after haemodialysis (Almutary et al., 2016), those having in-centre haemodialysis often face major disruptions in working and normal social activities. Due to the financial burden of haemodialysis in Vietnam, losing a job is likely to create financial difficulties. These factors might also contribute to a low HRQoL, although participants did report that had social support available for them.

This study has several limitations. First, causal relationships between social support and health outcomes cannot be confirmed in a cross-sectional study. In addition, a convenience sample was drawn from a single dialysis centre which limits the generalisability of the study results. However, the study site was one of the largest dialysis centres in Vietnam where people from various regions travel to receive their haemodialysis treatment. Another limitation of this study was the use of self-report instruments; thus, potential subjective bias may have occurred. However, these variables could not be objectively measured.

IMPLICATIONS FOR CLINICAL PRACTICE

Understanding the importance and availability of social support for patients on haemodialysis should be part of routine care. Dialysis nurses spend long periods of time with patients, and through active listening and direct assessment could identify when patients and/or their informal caregivers are needing more support, and to referral to social workers (if available). In Vietnam where there are no social workers and limited numbers of psychologists, nurses have a major role in assessing new patients and their caregivers on their start of haemodialysis therapy. Then, repeated assessments could be conducted at 6 months or a year depending on the patients' health conditions, to identify any changes in psychological status and support needs.

Nurses and other members of the multidisciplinary renal team should recognise that a haemodialysis is a stressful event and that depression and anxiety can occur. Early assessment of depression and anxiety would enable more timely referrals for appropriate treatment and tracking of changes over time on haemodialysis. A short and simple tool such as the DASS-21 could be used by nurses as an assessment tool in dialysis centres. In addition, early detection of psychological problems could assist renal teams to provide timely support and/or referral to psychologists (or other mental health support professionals if available) to prevent patients from developing more severe mental health issues.

For renal and dialysis nurses, adequate training in social support and mental well-being for people undergoing haemodialysis should be prioritised. Professional development would prepare the multidisciplinary renal team for the establishment and implementation of support activities/programs for patients in need. In a limited healthcare environment, such as Vietnam's, regular seminars or workshops to provide knowledge related to mental health problems and the roles of social support could raise nurses' awareness of these

issues. Also, training sessions guiding dialysis nurses to do psychological screening and support need assessment in their practice routine would be of benefit.

CONCLUSION

Although an overall moderate social support was perceived, the high level of depression and anxiety and low physical and mental HRQoL was reported among people undergoing haemodialysis. If a person did perceive social support functions were available, mental HRQoL was perceived better. These results highlight the need for considering psychological impacts, HRQoL and the availability of social support of patients undergoing haemodialysis, and that routine clinical assessments should be included in the framework of holistic care.

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CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

AUTHOR CONTRIBUTIONS

Van Lan Hoang, Theresa Green and Ann Bonner drafted and approved the manuscript.

ORCID

Van Lan Hoang  <http://orcid.org/0000-0002-2307-7655>

Ann Bonner  <https://orcid.org/0000-0001-9920-6743>

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AUTHOR BIOGRAPHY



Dr. Van Lan Hoang was a PhD candidate at the School of Nursing, Queensland University of Technology after completing her Masters' degree in nursing education. Her research project focuses on the social support provided for people undergoing haemodialysis in Vietnam. She is currently a nurse lecturer at the College of Health Sciences, VinUniversity, Vietnam.

SUPPORTING INFORMATION

Additional Supporting Information may be found online in the supporting information tab for this article.

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