Original Paper

The Interrelationship Between Psychosocial Adjustment and Spiritual Well-Being in Haemodialysis Patients and Their Family Caregivers

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ABSTRACT: Background: Patients undergoing maintenance haemodialysis and their family caregivers experience substantial psychosocial challenges. The objective of this study is to examine the associations between psychosocial adjustment and spiritual well-being in patients on maintenance haemodialysis and their family caregivers, and to identify factors independently associated with psychosocial adjustment. Methodology: A multicenter cross-sectional observational study was conducted with 130 patient-caregiver dyads in haemodialysis units in Greece. Data were collected through validated questionnaires assessing psychosocial adjustment, spiritual well-being, and sociodemographic characteristics. Correlational and univariate statistical analyses were performed. Variables associated with psychosocial adjustment in the univariate analyses were subsequently entered into multiple linear regression models to identify factors independently associated with psychosocial adjustment. Results: Patients demonstrated moderate difficulties in psychosocial adjustment, while caregivers showed moderate- to-good adjustment. Both groups reported moderate-to-high spiritual well-being. In correlational analyses, higher spiritual well-being was associated with better psychosocial adjustment, while psychosocial adjustment scores of the two groups were positively correlated. In multivariable analyses, spiritual well-being measures remained independently associated with several psychosocial adjustment domains. Younger age and employment were associated with better adjustment, whereas diabetes mellitus, cardiovascular disease, and more frequent caregiver accompaniment to haemodialysis were associated with greater adjustment difficulties. Conclusions: Spiritual well-being was associated with psychosocial adjustment in both patients and caregivers. Significant associations were also observed between patients' and caregivers' psychosocial adjustment. Several demographic, clinical, caregiving-related, and spiritual factors remained independently associated with patients' psychosocial adjustment. These findings support the importance of psychosocial and spiritual dimensions within haemodialysis care.

KEYWORDS: *Family caregivers, haemodialysis, psychosocial adjustment, spiritual well-being.*

Introduction

The definition of psychological adjustment to chronic illness entails maintaining everyday functioning and managing the emotional effects of the illness.

Therefore, adjustment to chronic illness is a multifaceted process which involves various psychological, social as well as physical factors.

These factors must be thoroughly evaluated when attempting to assess the adaptation difficulties of patients suffering a chronic health condition such as kidney failure [1].

Adjustment to the psychosocial challenges of haemodialysis for kidney failure is an ongoing struggle, as the patients are required to integrate this highly burdensome treatment into their everyday lives, face recurring complications and endure significant daily constraints.

Difficulty to adapt to the challenges of haemodialysis may lead to significant repercussions to the psychosocial well-being of the individual.

More specifically, evidence suggests that psychosocial adjustment to haemodialysis is positively associated with various indicators of psychosocial well-being such as quality of life, spiritual well-being, and treatment adherence [2].

On the other hand, adaptation difficulty has been found to be negatively associated with depression, anxiety, number of hospitalization days and mortality [3].

The psychosocial challenges associated with haemodialysis extend beyond the patient to their family caregivers, who share the burdens of chronic illness management.

Caregivers often experience diminished personal freedom and substantial caregiving strain, which may adversely affect their own psychosocial well-being [4].

According to current literature, family caregivers of patients with kidney failure experience elevated levels of burden [5,6].

This burden is significantly greater than that observed in the general population [7] and appears to directly affect caregivers' quality of life [8].

Anxiety and depression have also been identified as major predictors of increased

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caregiving burden and reduced quality of life among caregivers of patients with kidney failure [9], while numerous studies highlight caregivers' elevated risk for stress, depression, and anxiety, all of which contribute to the deterioration of their quality of life [10].

Research suggests that the psychosocial profiles of patients and caregivers are dynamically interrelated as distress or poor adjustment in one member of the dyad tends to mirror that of the other, whereas protective factors such as resilience, social support, and spirituality can enhance well-being for both [11].

Consequently, a dyadic perspective that considers the mutual influence of patients and caregivers is essential for developing holistic psychosocial interventions to enhance psychosocial adaptation in the context of maintenance haemodialysis.

Given the complex nature of adaptation to chronic illness, strategies to enhance adjustment should be grounded in patients' and caregivers' individual needs and lived experiences in the scope to identify the factors that facilitate or hinder each population's adaptation capacity and the interplay between them [12].

Spiritual Well-Being (SWB) is among the key factors that appear to promote psychosocial adjustment to illness, encompassing an individual's sense of inner peace, purpose, and connection with a higher power [13].

Studies suggest that patients undergoing chronic haemodialysis who employ coping strategies based on spiritual engagement appear to be more resilient [14], while spirituality has also been associated with the enhancement of Health-Related Quality of Life (HRQoL) [15].

Similarly, family caregivers with higher SWB appear to experience lower burden, which implies that spirituality enhances caregivers' psychosocial resilience [11].

Although research suggests that the psychological well-being of caregivers is directly related to the quality of the care they offer, no research has been done on the impact of the SWB of the caregivers on the psychosocial well-being of the patients they are caring for.

In light of the above, further systematic investigation is required to elucidate the interplay of psychosocial factors influencing the adaptation of individuals undergoing maintenance haemodialysis and their family caregivers.

Among these factors, spiritual well-being represents a key area of interest, alongside other sociodemographic variables that may also contribute to the process of psychosocial adjustment.

Objective

This cross-sectional observational study aimed to assess psychosocial adjustment and spiritual well-being among individuals undergoing maintenance haemodialysis and their family caregivers and to investigate demographic, socioeconomic, clinical and cross-dyad factors associated with psychosocial adjustment issues in kidney failure.

Methods

A multicenter cross-sectional observational study was conducted from December 2022 to November 2024, in Haemodialysis Units across mainland and island regions of Greece, which admit patients with kidney failure for maintenance haemodialysis.

Data were collected through questionnaire-based interviews administered by the principal investigator.

Eligible participants were identified based on the study's inclusion criteria, which dictated that participants should be adults, diagnosed with kidney failure, undergoing haemodialysis for at least six months and their main family caregiver.

Finally, 130 patients and 130 family caregivers consented to participate in this study.

With respect to ethical considerations, ethical approval for the present study was obtained from the relevant Institutional Review Boards and the administrations of the participating Haemodialysis Units prior to data collection.

Data collection, processing and storing was implemented in accordance with the Helsinki Declaration of 1964.

All eligible participants received detailed verbal and written information regarding the study aims, procedures, voluntary nature of participation, and their right to withdraw at any time without consequences for their treatment or care.

Written informed consent was obtained from all participants prior to enrolment.

Anonymity and confidentiality were strictly ensured by assigning numerical codes to questionnaires and removing all personally identifiable information from the dataset.

Data were stored securely and processed in compliance with the General Data Protection Regulation (GDPR; EU 2016/679), and access was restricted exclusively to the research team.

Data on participants' sociodemographic and clinical characteristics were collected using a questionnaire specifically developed to address the objectives of this study.

Psychosocial adjustment levels of all participants were assessed using the

Psychosocial Adjustment to Illness Scale-Self Report (PAIS-SR) [16], adapted and standardized for the Greek patient population [17].

Participants' spiritual well-being was assessed using the Spiritual Well-Being Scale (SWBS) [18], standardized for the Greek population [19].

Concerning data processing, all analyses were performed using SPSS version 21.0 (IBM Corporation, Somers, NY, USA).

Statistical significance was set at $p < 0.05$, with marginal significance defined as $0.05 < p < 0.10$.

Continuous variables were summarized using mean, standard deviation, median, and interquartile range (for non-normally distributed data). Categorical variables were presented as frequencies (n) and percentages (%).

Normality of continuous variables was assessed with the Kolmogorov-Smirnov test. Internal consistency of questionnaire subscales was evaluated using Cronbach's alpha coefficient.

A value ≥ 0.70 was considered acceptable for research purposes, indicating interrelated and homogeneous items, while values >0.80 were deemed desirable for clinical application.

Univariate analyses were conducted using Pearson's or Spearman's correlation coefficients, independent-samples t-tests, one-way analysis of variance (ANOVA), or the non-parametric Mann-Whitney and Kruskal-Wallis tests, as appropriate, to examine associations between psychosocial adjustment subscales and demographic, socioeconomic, clinical, caregiving-related, and spiritual well-being variables.

Variables demonstrating associations at $p < 0.10$ in the univariate analyses were subsequently entered into stepwise multiple linear regression models to identify factors independently associated with each psychosocial adjustment subscale.

Results

Descriptive analysis of PAIS-SR and SWBS data

Regarding the psychosocial adjustment of patients, the patients scores in individual subcategories of the PAIS-SR scale were significantly lower than the scale's midpoint score.

The sum of the mean values of the scale's subcategories for patients was 49.84±24.61, corresponding to moderate difficulty in adaptation.

Similarly, the total mean score of the scale's subcategories for family caregivers was 37.41±20.45, which corresponds marginally to moderate-to-good psychosocial adjustment according to the scale's scoring system.

Table 1. Descriptive statistics for the PAIS-SR and SWBS subscales among patients and family caregivers.

Group	Measure	Subscale	Mean	SD	Min	Max	Scale midpoint (range)
Patients	PAIS-SR	Health Care Orientation	5.40	3.38	0.0	15.0	9 (0-18)
		Job and Household Duties	12.25	7.62	0.0	27.0	13.5 (0-27)
		Relationships with Family	4.17	3.73	0.0	17.0	10.5 (0-21)
		Sexual Relationships	7.98	5.23	0.0	15.0	7.5 (0-15)
		Extended Family Relationships	2.74	3.83	0.0	15.0	7.5 (0-15)
		Social Environment	8.54	6.59	0.0	18.0	9 (0-18)
		Psychological Distress	8.75	4.00	0.0	19.0	12 (0-24)
Caregivers	PAIS-SR	Health Care Orientation	4.84	3.26	0.0	14.0	9 (0-18)
		Job and Household Duties	6.62	5.24	0.0	24.0	13.5 (0-27)
		Relationships with Family	3.09	3.06	0.0	12.0	10.5 (0-21)
		Sexual Relationships	5.04	4.99	0.0	15.0	7.5 (0-15)
		Extended Family Relationships	3.92	4.16	0.0	15.0	7.5 (0-15)
		Social Environment	6.49	5.32	0.0	18.0	9 (0-18)
		Psychological Distress	7.41	3.49	0.0	21.0	12 (0-24)
Patients	SWBS	Affiliation with God	32.19	11.38	8.0	48.0	20 (8-48)
		Satisfaction with Life	18.72	6.45	6.0	30.0	12.5 (5-30)
		Alienation from God	29.55	5.96	18.0	40.0	17.5 (7-42)
Caregivers	SWBS	Affiliation with God	32.01	10.79	8.0	48.0	20 (8-48)
		Satisfaction with Life	19.20	6.52	9.0	30.0	12.5 (5-30)
		Alienation from God	30.46	6.41	18.0	42.0	17.5 (7-42)

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As illustrated in Table 1, patients exhibited higher scores across all subcategories of the scale, with particularly large differences observed in the domains of *Household Duties* and *Sexual Relationships.*

Regarding the Spiritual Well-Being of the participants, the scores in all subcategories of the scale are higher than the scale's midpoint score.

Specifically, the sum of the mean values of the subcategories is 80.45±19.65 for the patients and 81.67±19.34 for the family caregivers, which corresponds to moderate-to-high spiritual well-being.

Inferential Statistical Analysis

The inferential statistical analysis (Table 2) examined the correlations between psychosocial adjustment and spiritual well-being among individuals undergoing maintenance haemodialysis.

For patients, a statistically significant low negative correlation ($r<0.3$) was observed between the *Affiliation with God* subscale and the subscales *Relationships with Family*, *Extended Family Relationships*, and *Psychological Distress*; between *Satisfaction with Life* and the subscales *Relationships with Family* and *Psychological Distress*; and between *Alienation from God* and the subscales *Job and Household Duties*, *Sexual Relationships*, and *Social Environment*.

In addition, a statistically significant moderate negative correlation ($0.3<r<0.5$) was found between *Alienation from God* and the subscales *Health Care Orientation*, *Relationships with Family*, *Extended Family Relationships*, and *Psychological Distress*.

These findings indicate that greater alienation from God is associated with greater difficulties in health care orientation, family relationships, and management of psychological distress.

Overall, patients with higher SWBS scores demonstrated lower PAIS-SR scores, suggesting that higher levels of spiritual well-being are associated with better psychosocial adjustment among individuals undergoing haemodialysis.

Table 2. Correlation of the psychosocial adjustment and spiritual well-being of individuals undergoing haemodialysis.

	Affiliation with God	Satisfaction with life	Alienation from God***
Health Care Orientation	-0.159	-0.007	-0.497**
Job Household Duties	0.005	-0.054	-0.175*
Relationships with Family	-0.266**	-0.199*	-0.477**
Sexual Relationships	-0.060	-0.019	-0.257*
Extended Family Relationships	-0.233*	-0.152	-0.408**
Social Environment	0.041	-0.065	-0.273**
Psychological Distress	-0.182*	-0.197**	-0.358**

*p<0.05, **p<0.005, ***Higher scores on all SWBS subscales indicate greater spiritual well-being. For the Alienation from God subscale, higher scores indicate lower perceived alienation from God (reverse-scored items).

Concerning the effect of the spiritual well-being of the caregivers on the psychosocial adjustment of the patients, the analysis (Table 3) revealed a statistically significant low negative correlation ($r <0.3$) between the caregivers' *Affiliation with God* subscale and the patients' subscales *Relationships with Family*, *Extended Family Relationships,* and *Psychological Distress*; between the caregivers' *Satisfaction with Life* subscale and the patients' subscales *Relationships with Family* and *Extended Family Relationships*; and between the caregivers' *Alienation from God* subscale and the patients' subscales *Health Care Orientation*, *Job and Household Duties*, *Extended Family Relationships*, *Social Environment*, and *Psychological Distress*.

In addition, a statistically significant moderate negative correlation ($0.3<r<0.5$) was observed between the caregivers' *Alienation from God* subscale and the patients' subscales *Relationships with Family* and *Sexual Relationships*.

These findings indicate that patients whose caregivers report higher levels of spiritual well-being on the SWBS tend to demonstrate lower scores on the PAIS-SR, reflecting better psychosocial adjustment.

Conversely, greater alienation from God among caregivers appears to be associated with more pronounced difficulties in patients' family and sexual relationships.

Table 3. Correlation of the psychosocial adaptation of patients and the spiritual well-being of their family caregivers.

		Caregivers		
		Affiliation from God	**Satisfaction with life**	**Alienation from God**
Patients	**Health Care Orientation**	-0.166	-0.075	-0.298**
	Job Household Duties	-0.151	-0.097	-0.245**
	Relationships with Family	-0.298**	-0.235**	-0.397**
	Sexual Relationships	-0.165	-0.002	-0.328**
	Extended Family Relationships	-0.265**	-0.202*	-0.289**
	Social Environment	-0.081	-0.079	-0.176*
	Psychological Distress	-0.198*	-0.172	-0.236*

*p<0.05, **p<0.005

Concerning the correlation between the psychosocial adjustment of patients and the psychosocial adjustment of their family caregivers, as shown in Table 4, nearly all subscales of patients' psychosocial adjustment were found to be significantly and positively correlated with the corresponding subscales of caregivers' psychosocial adjustment, with correlation coefficients ranging from r=0.173 to r=0.631.

The strongest correlations were observed between the caregivers' *Job and Household Duties* subscale and the patients' subscales *Health Care Orientation* (r=0.524), *Relationships with Family* (r=0.631), and *Extended Family Relationships* (r=0.497), as well as between the caregivers' *Extended Family Relationships* subscale and the patients' subscales *Relationships with Family* (r=0.539) and *Extended Family Relationships* (r=0.618).

These findings suggest that the psychosocial adjustment levels of patients and their caregivers are mutually interdependent, such that improved adjustment in one group is associated with improved adjustment in the other.

Consequently, interventions aimed at enhancing the psychosocial well-being of either patients or caregivers are likely to have reciprocal benefits for both.

Table 4. Correlation of the psychosocial adaptation of patients and their family caregivers.

		Caregivers						
		Health Care Orientation	**Job Household Duties**	**Relationships with Family**	**Sexual Relationships**	**Extended Family Relationships**	**Social Environment**	**Psychological Distress**
Patients	**Health Care Orientation Care**	0.451**	0.380**	**0.524****	0.259**	0.415**	0.309**	0.317**
	Job Household Duties	0.201*	0.367**	0.412**	0.247**	0.354**	0.317**	0.288**
	Relationships with Family	0.427**	0.378**	**0.631****	0.178*	**0.539****	0.231*	0.304**
	Sexual Relationships	0.231*	0.262**	0.354**	0.252**	0.194*	0.224*	0.316**
	Extended Family Relationships	0.280**	0.289**	**0.497****	0.164	**0.618****	0.274**	0.303**
	Social Environment	0.249**	0.293**	0.275**	0.106	0.249**	0.274**	0.379**
	Psychological Distress	0.289**	0.193*	0.331**	0.044	0.277**	0.127	0.293**

*p<0.05, **p<0.005

Univariate analysis of the PAIS-SR subcategories of patients with respect to sociodemographic features of the family caregivers

The univariate analysis was conducted using Pearson's or Spearman's correlation coefficient, independent-samples t-test, one-way analysis of variance (ANOVA), or the non-parametric Mann-Whitney and Kruskal-Wallis tests, in order to examine the relationship between the dependent variables (PAIS-SR subscales) and the quantitative and qualitative sociodemographic indicators, respectively.

Associations between variables with p<0.05 were considered statistically significant.

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As shown in Table 5, an increase in the number of daily caregiving hours was associated with greater caregiver difficulty in the domains of *Health Care Orientation* and *Extended Family Relationships*.

Likewise, a higher frequency of accompanying the patient to haemodialysis sessions was linked to increased *Psychological Distress* among caregivers.

Furthermore, both variables were associated with greater adjustment difficulties for both patients and caregivers in the domain of *Job* and *Household Duties*.

Increased caregiving time and accompaniment frequency also corresponded to greater caregiver difficulties in *Sexual* and *Social Relationships*.

Patients whose caregivers were their children demonstrated more pronounced difficulties in sexual, social, and immediate family relationships compared to those whose caregivers were spouses or other relatives.

In addition, when caregivers were employed, patients exhibited more difficulties in family relationships and higher levels of psychological distress compared to those whose caregivers were unemployed.

Finally, patients with female caregivers appeared to be better adjusted in social relationships than those with male caregivers.

Table 5. Univariate analysis of sociodemographic variables of family caregivers with PAIS-SR subcategories for patients.

Variables	Health Care Orientation	Job Household Duties	Relationships with Family	Sexual Relationships	Extended Family Relationships	Social Environment	Psychological Distress
Gender	NS	NS	NS	NS	NS	p=0.038	NS
Education	NS	NS	NS	NS	NS	NS	NS
Relationship with patient	NS	NS	p=0.013	p=0.034	NS	p=0.050	NS
Employment	NS	NS	NS	NS	NS	NS	p=0.052
Age	NS	NS	NS	NS	NS	NS	NS
Daily care (hours)	p=0.005	p=<0.005	p=0.011	p<0.005	0.003	p<0.005	NS
HD sessions (weekly)	NS	p=0.014	p=0.044	p=0.007	NS	p<0.005	p=0.008

*p<0.05, **p<0.005

Multivariable linear regression analyses

To identify variables independently associated with psychosocial adjustment after accounting for potential confounding factors, variables demonstrating associations with each psychosocial adjustment domain at p <0.10 in the univariate analyses were entered into stepwise multiple linear regression models to identify variables independently associated with psychosocial adjustment. Separate models were developed for each PAIS-SR subscale.

The final models explained between 30.2% and 56.4% of the variance across the psychosocial adjustment domains (Table 6).

In these analyses, caregiver psychosocial adjustment emerged as an important factor across several models.

Better caregiver adjustment in the *Relationships with Family* domain remained independently associated with patients' adjustment in the Health Care Orientation, Job and Household Duties, Relationships with Family, Sexual Relationships, and Psychological Distress domains.

Similarly, better caregiver adjustment in the *Extended Family Relationships* and *Social Environment* domains remained independently associated with the corresponding patient domains.

Patient spiritual well-being also remained independently associated with psychosocial adjustment.

Higher scores on the *Alienation from God* subscale (indicating lower perceived alienation from God) remained independently associated with better psychosocial adjustment across six of the seven domains., while higher *Satisfaction with Life* remained independently associated with lower psychological distress.

Several demographic and clinical characteristics also remained independently associated with psychosocial adjustment after adjustment for other variables.

Older age, diabetes mellitus, cardiovascular disease, lower income, more frequent accompaniment to haemodialysis sessions, and longer caregiving duration were associated with poorer adjustment in selected domains, whereas patient employment and being married were associated with better psychosocial adjustment in specific domains.

Table 6. Multivariable linear regression analyses of psychosocial adjustment domains.

PAIS-SR domain	Variables retained in the final model	Total variance explained (R^2)	F (model)	p-value
Health Care Orientation	Caregiver Relationships with Family; Patient Alienation from God; Caregiver Social Environment; Diabetes mellitus	41.1%	21.80	<0.001
Job and Household Duties	Caregiver Relationships with Family; Patient employment; Patient age; Caregiver Extended Family Relationships	33.4%	15.66	<0.001
Relationships with Family	Caregiver Relationships with Family; Marital status; Patient Alienation from God; Income; Frequency of haemodialysis accompaniment	56.4%	32.08	<0.001
Sexual Relationships	Patient age; Caregiver Relationships with Family; Patient Alienation from God; Caregiver relationship to patient	39.0%	19.85	<0.001
Extended Family Relationships	Caregiver Extended Family Relationships; Patient Alienation from God; Daily caregiving duration	44.0%	33.02	<0.001
Social Environment	Frequency of haemodialysis accompaniment; Patient Alienation from God; Income; Patient age; Diabetes mellitus; Caregiver Social Environment; Patient sex	43.1%	13.19	<0.001
Psychological Distress	Patient Alienation from God; Frequency of haemodialysis accompaniment; Diabetes mellitus; Caregiver Relationships with Family; Cardiovascular disease; Satisfaction with Life	30.2%	8.88	<0.001

Discussion

The present study explored the psychosocial adjustment and spiritual well-being of patients undergoing maintenance haemodialysis and their family caregivers, as well as the interrelationships between these factors.

The findings revealed significant associations between spiritual well-being and psychosocial adjustment in both groups, as well as significant associations between the psychosocial profiles of patients and caregivers.

Moreover, the multivariable analyses demonstrated that several demographic, clinical, caregiving-related and spiritual variables remained independently associated with specific psychosocial adjustment domains after adjustment for potential confounding factors.

Consistent with previous studies [2,3], higher levels of spiritual well-being were associated with fewer psychosocial adjustment difficulties among patients.

This finding suggests that spiritual well-being is closely associated with psychosocial adjustment in individuals on maintenance haemodialysis.

Patients who reported a stronger *Affiliation with God* and greater *Life Satisfaction* tended to experience lower levels of psychological distress and better adjustment in family and social domains.

Conversely, *Alienation from God* was linked to poorer adjustment across several domains, including *Health Care Orientation* and *Family Relationships*

These findings align with earlier evidence on the importance of spirituality in chronic kidney disease [20].

Importantly, the multivariable analyses demonstrated that patients' *Alienation from God* remained independently associated with six of the seven psychosocial adjustment domains after adjustment for demographic, clinical and caregiving-related variables, while *Satisfaction with Life* remained independently associated with lower *Psychological Distress*.

Similarly, caregivers with higher levels of spiritual well-being demonstrated fewer psychosocial adjustment difficulties.

Furthermore, caregiver psychosocial adjustment remained independently associated with several patient psychosocial adjustment domains in the multivariable models, particularly in the areas of *Family Relationships*, *Health Care Orientation*, *Job* and *Household* Duties and *Psychological Distress*, supporting the importance of considering patient and caregiver characteristics together.

This result resonates with prior research emphasizing the beneficial role of spirituality against caregiver burden and emotional distress [8,6].

Most importantly, caregivers' spiritual well-being was also found to correlate with patients' psychosocial adjustment, suggesting that caregiver spiritual well-being and patient psychosocial adjustment are closely associated.

Although this association remained significant after adjustment, the cross-sectional design does not allow conclusions regarding the direction of this relationship.

The observed positive correlations between the psychosocial adjustment subscales of patients and caregivers further demonstrate the close association between the psychosocial adjustment profiles of patients and caregivers.

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These results are consistent with previous findings indicating that caregiver well-being significantly affects patient outcomes [10,21].

The multivariable analyses further demonstrated that caregiver psychosocial adjustment remained independently associated with several patient psychosocial adjustment domains even after adjustment for demographic and clinical covariates.

These findings support the importance of considering patients and caregivers as an interconnected unit when assessing psychosocial adjustment.

However, because the present study is cross-sectional, these associations should not be interpreted as evidence of causal or reciprocal effects, and confirmation using longitudinal dyadic analytical approaches is warranted.

Sociodemographic, clinical and caregiving-related characteristics were associated with psychosocial adjustment in both the univariate and multivariable analyses.

After adjustment for potential confounding factors, older age, diabetes mellitus, cardiovascular disease, lower income, more frequent accompaniment to haemodialysis sessions and longer caregiving duration remained independently associated with poorer psychosocial adjustment in selected domains, whereas employment and marital status were independently associated with better adjustment in specific domains.

These findings corroborate earlier reports highlighting caregiving intensity as a predictor of emotional strain [5].

Moreover, the results suggest that patients cared for by their children rather than spouses may face greater difficulties in maintaining sexual and family relationships.

Employment status and caregiver gender also emerged as relevant factors, with working caregivers associated with higher patient distress and female caregivers linked to better patient social adjustment-findings that warrant further exploration in future studies.

The present study has several strengths, including the simultaneous assessment of patients and their primary family caregivers as dyads, the use of established psychometric instruments and the application of multivariable regression analyses to account for several measured demographic, clinical, caregiving-related and spiritual factors.

Several limitations should also be acknowledged.

The cross-sectional design precludes determination of temporal or causal relationships, while the non-probability sampling strategy may limit the generalizability of the findings.

The use of self-report instruments may introduce response and social-desirability bias.

Although multivariable analyses accounted for several measured characteristics, residual confounding from unmeasured factors, including family functioning and shared religious or cultural background, cannot be excluded.

Furthermore, formal dyadic modelling, such as the Actor-Partner Interdependence Model, was not performed.

Future longitudinal studies employing prespecified dyadic analytical approaches are therefore warranted.

Conclusions

To conclude, this study demonstrates that spiritual well-being is independently associated with psychosocial adjustment in haemodialysis patients and their family caregivers, even after adjustment for several demographic, clinical and caregiving-related factors.

The findings support the incorporation of psychosocial and spiritual assessment into comprehensive haemodialysis care.

However, longitudinal studies using formal dyadic analytical approaches are required before causal relationships or intervention effects can be inferred.

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None to declare.

Author Contributions

Mrs. Maria Skoulatou is the corresponding author and the principal researcher who contributed to the design and implemented this research including, selecting participants, collecting and analyzing data and composing this manuscript in the context of her PhD thesis. Dr. Anna Kavga- Paltoglou, as the supervising professor, conceived the study and coordinated its implementation. Dr. Ioannis Kalemikerakis, Dr. Ourania Govina and Dr. Anna Kavga-Paltoglou, contributed equally in the design of the study, data analysis and editing of the manuscript.

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Conflicts of interest

The authors declare no competing interests.

Institutional Review Board

Ethical approval was obtained from the individual Hospital ethics committees of all the

participating Haemodialysis Units. The protocol of this study was submitted and approved by the Research Ethics and Deontology Committee (R.E.D.C.) of the University of West Attica (UNIWA), at its meeting no. 12/05-05-2023, with protocol number 41559/26-04-2023. The Committee determined that the study does not contravene the applicable legislation and complies with generally accepted ethical and research integrity principles regarding both the content and the conduct of the research project.

Consent Statement

All human subjects involved in this study provided a written informed consent prior to participation, including the consent of publishing their anonymized data.

Data availability

All data presented in the manuscript are available from the authors upon request.

References

1. Stanton AL, Revenson TA, Tennen H. Health psychology: psychological adjustment to chronic disease. Annu Rev Psychol, 2007, 58(1):565-592.
2. Kim K, Kang GW, Woo J. The quality of life of hemodialysis patients is affected not only by medical but also psychosocial factors: a canonical correlation study. J Korean Med Sci, 2018, 33(14):e111.
3. Schouten RW, Haverkamp GL, Loosman WL, Shaw PKC, van Ittersum FJ, Smets YFC, et al. Anxiety symptoms, mortality, and hospitalization in patients receiving maintenance dialysis: a cohort study. Am J Kidney Dis, 2019, 74(2):158-166.
4. Senmar M, Rafiei H, Yousefi F, Razaghpoor A, Bokharaei M. Caregiver burden among family caregivers of older patients receiving hemodialysis and its relevant factors. J Nephropharmacol, 2019, 8(1):e12.
5. Mashayekhi F, Pilevarzadeh M, Rafati F. The assessment of caregiver burden in caregivers of hemodialysis patients. Mater Sociomed, 2015, 27(5):333.
6. Intas G, Rokana V, Stergiannis P, Chalari E, Anagnostopoulos F. Burden and sleeping disorders of family caregivers of hemodialysis patients with chronic kidney disease-end stage: a cross-sectional study. Adv Exp Med Biol, 2020, 1196:33-40.
7. Jadhav BS, Dhavale HS, Dere SS, Dadarwala DD. Psychiatric morbidity, quality of life and caregiver burden in patients undergoing hemodialysis. Med J DY Patil Univ, 2014, 7(6):722.
8. Pio TMT, Prihanto JB, Jahan Y, Hirose N, Kazawa K, Moriyama M. Assessing burden, anxiety, depression, and quality of life among caregivers of hemodialysis patients in Indonesia: a cross-sectional study. Int J Environ Res Public Health, 2022, 19(8):4544.
9. Adejumo OA, Iyawe IO, Akinbodewa AA, Abolarin OS, Alli EO. Burden, psychological well-being and quality of life of caregivers of end stage renal disease patients. Ghana Med J, 2019, 53(3):190-196.
10. Hawamdeh S, Almari AM, Almutairi AS, Dator WLT. Determinants and prevalence of depression in patients with chronic renal disease and their caregivers. Int J Nephrol Renovasc Dis, 2017, 10:183.
11. Rafati F, Mashayekhi F, Dastyar N. Caregiver burden and spiritual well-being in caregivers of hemodialysis patients. J Relig Health, 2020, 59(6):3084-3096.
12. Sajadi SA, Ebadi A, Moradian ST. Quality of life among family caregivers of patients on hemodialysis and its relevant factors: a systematic review. Int J Community Based Nurs Midwifery, 2017, 5(3):206.
13. Tirgari B, Khaksari M, Soltani Z, Mirzaee M, Saberi S, Bashiri H. Spiritual well-being in patients with chronic diseases: a systematic review and meta-analysis. J Relig Health, 2022, 61(5):3969-3987.
14. Vitorino LM, Soares RCE, Santos AEO, Lucchetti ALG, Cruz JP, Cortez PJO, et al. Two sides of the same coin: the positive and negative impact of spiritual religious coping on quality of life and depression in dialysis patients. J Holist Nurs, 2018, 36(4):332-340.
15. Darvishi A, Otaghi M, Mami S. The effectiveness of spiritual therapy on spiritual well-being, self-esteem and self-efficacy in patients on hemodialysis. J Relig Health, 2020, 59(1):277-288.
16. Derogatis LR. The psychosocial adjustment to illness scale (PAIS). J Psychosom Res, 1986, 30(1):77-91.
17. Kolokotroni P, Anagnostopoulos F, Missitzis I. Psychosocial adjustment to illness scale: factor structure, reliability, and validity assessment in a sample of Greek breast cancer patients. Women Health, 2017, 57(6):705-722.
18. Ellison CW. Spiritual well-being: conceptualization and measurement. J Psychol Theol, 1983, 11(4):330-338.
19. Darvyri P, Galanakis M, Avgoustidis AG, Vasdekis S, Artemiadis A, Tigani X, et al. The spiritual well-being scale (SWBS) in Greek population of Attica. Psychology, 2014, 5(13):1575.
20. Chironda G, Bhengu B. Perceptions of caregivers regarding engagement with integrated management of chronic kidney disease patients in selected public hospitals of KwaZulu-Natal region, South Africa. Health SA Gesondheid, 2018, 23(1):1-9.
21. Shukri M, Mustofai MA, Md Yasin MAS, Tuan Hadi TS. Burden, quality of life, anxiety, and depressive symptoms among caregivers of hemodialysis patients: the role of social support. Int J Psychiatry Med, 2020, 55(6):397-407.

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