

E-ISSN: 2582-2160 • Website: <u>www.ijfmr.com</u> • Email: editor@ijfmr.com

Conservation Energy Management on Fatigue in Hemodialysis Patients: A Literature Review

Mia Cahyati¹, Yevri Zulfiqar², Fitri Mailani³

^{1,2,3}Faculty of Nursing, Universitas Andalas, Indonesia

Abstract

Background: Fatigue is a frequent complaint experienced by patients undergoing hemodialysis, potentially reducing their participation in daily activities. Conservation energy management is proposed as an effective approach to reduce fatigue in hemodialysis patients.

Objective: This study aimed to evaluate the effect of conservation energy management on fatigue in hemodialysis patients through a literature review.

Methods: This article is a literature review of research articles selected through searching three electronic databases, namely Science Direct, Wiley, and PubMed. The keywords used included 'conservation energy management', 'fatigue', and 'hemodialysis'. Inclusion criteria were English-language articles published within the last five years, focusing on quantitative research, involving adult samples, relevant full-text articles, and original articles.

Results: There were five articles that met the inclusion criteria. The findings showed that a conservation energy management program can reduce fatigue and improve quality of life in patients undergoing hemodialysis.

Conclusion: This study found that conservation energy management can be effective in reducing fatigue in hemodialysis patients.

Keywords: Conservation Energy Management, Fatigue, Hemodialysis

INTRODUCTION

Chronic kidney disease (CKD) is an increasing global health problem, and hemodialysis is the primary therapy for patients with end-stage renal disease (ESRD) (1). Hemodialysis, although essential for patient survival, is often accompanied by various complications that impair quality of life, one of which is fatigue (2). Fatigue in hemodialysis patients not only causes a decrease in energy and vitality but also impacts the patient's ability to participate in daily activities, interact socially, and maintain optimal mental and physical health (3).

Fatigue in patients undergoing hemodialysis is a multidimensional phenomenon caused by a combination of physiological, psychological, and social factors (4). Factors such as uremic toxin accumulation, anemia, malnutrition, and chronic inflammation can exacerbate fatigue. On the other hand, emotional instability, anxiety, depression, and limited social support also play an important role in aggravating this condition (5). Given the complexity of the causes of fatigue, a comprehensive management approach is necessary to improve the quality of life of patients (6).

Conservation energy management is one of the intervention approaches that is gaining attention in addressing fatigue in hemodialysis patients (7). This approach aims to help patients manage and utilize



their energy more efficiently, so that they can carry out their daily activities without experiencing excessive fatigue. The intervention involves educating patients on energy-saving techniques, scheduling activities, and providing advice on adequate rest and stress management (8).

OBJECTIVE

This study aims to evaluate the effect of conservation energy management on fatigue in hemodialysis patients through a literature review.

METHODS

This article is a literature review that summarizes and analyzes the results of related research articles. The literature search was conducted using three major electronic databases: Science Direct, Wiley, and PubMed, using the keywords "conservation energy management" AND "fatigue" AND "hemodialysis". The search was conducted following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol and involved selecting articles based on predefined inclusion criteria. The article search period lasted from January to June 2024. The inclusion criteria in the literature search were as follows: (1) freely accessible English-language articles published within the last five years (2019-2024), (2) studies involving hemodialysis patients, (3) articles using quantitative research methods, (4) articles in full text, and (5) articles that were relevant and original research. The exclusion criteria included articles that did not have a full structure, articles in the form of systematic/literature reviews, and articles with qualitative research methods.

From the search, a total of 1,262 articles were found, with 231 articles from the Science Direct database, 4 articles from the PubMed database, and 188 articles from Wiley. After initial screening of 423 articles based on the exclusion criteria, 412 articles were eliminated because they did not meet the inclusion criteria. Further screening of the remaining 11 articles resulted in 5 articles that met all inclusion criteria and were ready for further analysis.







E-ISSN: 2582-2160 • Website: <u>www.ijfmr.com</u>

• Email: editor@ijfmr.com

RESULTS

Table 1. Journal Extraction

No	Title, Author, Year	Objective	Methods	Results	Conclusion
1.	A pilot randomised	To evaluate	Study design:	1. Of the 253	Energy
	controlled trial of an	the feasibility	Randomized	patients	management
	energy management	of conducting	controlled trial (RCT)	screened,	programs can
	programme for adults	a randomized	with two parallel	159 patients	improve
	on maintenance	controlled	groups.	were	patients' life
	haemodialysis: the	trial (RCT) of	Sample size: 30	eligible and	participation
	fatigue-HD study	an energy	participants	42 patients	although the
		management	undergoing	gave	direct effect
	Janine F Farragher,	program for	maintenance	informed	on fatigue
	Pietro Ravani,	patients	hemodialysis recruited	consent to	may not be
	Braden Manns,	undergoing	from six dialysis units	participate.	very large
	Meghan Elliott,	maintenance	in Calgary, Canada	2. 30 patients	
	Chandra Thomas,	hemodialysis.	Sample selection:	met the	
	Maoliosa Donald,	Secondary	simple random	eligibility	
	Nancy Verdin,	objectives are	sampling	criteria and	
	Brenda R	to estimate	Inclusion criteria:	were	
	Hemmelgarn	the effects of	1. Patients	randomized	
		the program	undergoing	(mean age	
	2022	on various	maintenance	62.4 years,	
		aspects of	hemodialysis	60% male)	
		fatigue and	2. Clinically stable	3. 22	
		life	3. Reported	participants	
		participation.	bothersome	completed	
			fatigue	all study	
			Exclusion criteria:	procedures	
			1. Patients who do	4. The	
			not speak English	intervention	
			2. Patients who are	program	
			clinically or	showed	
			cognitively	moderate	
			unstable	effects on	
			3. Patients who plan	several	
			to stop	measures of	
			hemodialysis in	life	
			six months	participation	
			4. Patients who	and	
			lived in long-term	satisfaction	
			care facilities or	at one week	
			had visual	atter the	
			impairment that	intervention	



2. Energy conservation for single Evaluating by the impact of fatigue intervention Study design: fatigue fatigue 1. Participation performance participation performance performa						-
2. Energy conservation intervention of atigue intervention intervention beta Evaluating beta Study beta 1. Participation intervention compared to Performance participation performance and satisfaction effects at 12 weeks after intervention compared to Performance participation performance and satisfaction 2. Fatigue participation performance severity intervention performance and satisfaction intervention performance and satisfaction 3. Fatigue participation performance severity intervention performance and satisfaction intervention performance and satisfaction 4. Modified Fatigue management program physical, cognitive, intervention for intervention for intervention for education intervention Evaluating the entervention frectiveness people with end stage kidney disease conservation 1. Participants who re- ceived the entergy conservation effective in				precluded	and large	
Image: SeverityStatigue management Questionnaire (FMQ) to assess fatigue managementweeks after the intervention compared to the control group1.Canadian compared to the control groupgroup1.Statigue severity Scale (FSS) to assess fatigue management Questionnaire (FMQ) to assess fatigue managementHe study. the intervention performance and satisfaction2.Energy conservation education intervention for perfectiveness nitervention for intervention for education intervention for education intervention for education intervention for education intervention for educationEvaluating the Evaluating the Stage kidney disease of an energy1.Participants who re- ceived the energy conservation education the enfectiveness o conservation education intervention for education intervention for education education intervention for education intervention for education intervention econservation econservation econservation econservation econservation econservation econservation enducation <b< th=""><th></th><th></th><th></th><th>participation in</th><th>effects at 12</th><th></th></b<>				participation in	effects at 12	
Instruments:the intervention Coupationalthe intervention compared to the control groupICanadianintervention compared to the control groupICanadiancontrol performance satisfactionIFatigue severityScale (FSS) to assess fatigue severityIFatigue severityIFatigue severityIFatigue managementIModified Fatigue impact Scale (MHS) to assess fatigue managementIModified Fatigue magementIModified Fatigue managementIFatigue on physical, cognitive, and psychosocial functioningType of Intervention Energy management program called Personal Energy Planning (PEP) to help patients manage fatigueIEnergy conservation reflectiveness reclucation intervention for education intervention for epople with end stage kidney disease of an energyIEnergy conservation effectiveness rendomized control reflectivenessStudy design randomized control resonal Energy who re- ceived the effective inIEnergy conservation effectiveness rendomized control resonal Energy Pragmatic cluster randomized control resonal Energy regram called personal Energy regram is servation effective inIStudy design energy conservation effective inIStudy design enduces rendomized control relawith repeated energy con energy con energy con effective inIStudy design energy con energy con 				the study.	weeks after	
1. Canadian Occupational Performance Measure (COPM) to assess life participation performance and satisfactionintervention compared to the control group2. Fatigue Severity Scale (FSS) to assess fatigue management (FMQ) to assess fatigue management. Fatigue Management Questionnaire (FMQ) to assess fatigue management4. Modified Fatigue Impact Scale (MFIS) to assess the impact of fatigue on physical, cognitive, and psychosocial functioning Type of Intervention: Energy management program called Personal Energy Planning (PEP) to help patents manage fatigue1. Participants who re- ceived the energy conservation fragine2.Energy conservation education intervention for education intervention for an energy tage kidney disease conservationStudy design: rial with repeated repole with end- of an energy trial with repeated energy conservation measuresAn energy program is server with end- server with end- of an energy				Instruments:	the	
Image: stage kidney diseaseEvaluatingStage kidney diseaseStage stage kidney diseaseAn energy2.Energy conservationEvaluatingStudy design: randomized control1. Participants who re- randomized controlAn energy3.Energy conservationEvaluating references randomized controlStudy design: reparatic cluster randomized control1. Participants who re- ceived the references references4.Modified Stage references reference1. Participants who re- reference references referencesAn energy reference reference reference reference5.Energy conservation references restage kidney disease restage kidney diseaseStudy design: reference reference restage kidney disease restage kidney disease1. Participants reference reference reference regramatic cluster randomized control restage kidney diseaseStudy design: restage kidney disease1. Participants restage cluster restage control restage kidney diseaseAn energy restage cluster randomized control restage cluster restage kidney diseaseStudy design: restage cluster randomized control restage kidney diseaseStudy design: restage cluster randomized control restage kidney diseaseStudy design: restage cluster restage kidney diseaseStudy design: restage cluster restage kidney diseaseStudy design: restage cluster restage kidney diseaseStudy design: restage cluster restage cluster restage cluster restage kidney diseaseStudy design: restage cluster restage cluster restage kidney diseaseStudy design: restage cl				1. Canadian	intervention	
2.Energy conservation for the report education for a sees the the impactImpact the the impact the impact the impact the impactImpact the the impact the impact2.Energy conservation ferturention therwrition the report educationEvaluating the				Occupational	compared to	
Image: series of the server				Performance	the control	
 to assess life participation performance and satisfaction Fatigue Severity Scale (FSS) to assess fatigue severity Fatigue Management Questionnaire (FMQ) to assess fatigue management Modified Fatigue Impact Scale (MFIS) to assess the impact of fatigue on physical, cognitive, and psychosocial functioning Type of Intervention: Energy management program called Personal Energy Planning (PEP) to help patients manage Energy conservation the frective set fatigue Energy conservation of an energy reamagement calculation for effectiveness of an energy conservation reasures 				Measure (COPM)	group	
2.Energy conservation reducation for energy preservationEvaluating the for an energy pragmatic cluster trial with repeated servation1.Participants participants participants servation servation2.Energy conservation education for people with end stage kidney diseaseEvaluating the for an energy pragmatic cluster trial with repeated servation1.Participants participants the effective in program2.Energy conservation education for people with end stage kidney diseaseEvaluating the of an energy conservation trial with repeated measures1.Participants program conservation effective in servation				to assess life	8 - 1	
2.Energy conservation education for for there with energy patients manage kidney disease for energy conservation effectiveness for an energy the energy stage kidney disease conservation1.Participants performance and satisfaction assess fatigue management Questionnaire (FMQ) to assess fatigue management 4.Modified Fatigue Impact Scale (MFIS) to assess the impact of fatigue on physical, cognitive, and psychosocial functioning Type of Intervention: Energy management program called Personal Energy Planning (PEP) to help patients manage fatigue1.Participants conservation eclucation who re- ceived the education for an energy the of an energy tig with repeated intervention1.Participants conservation eclucation who re- ceived the education program is servation				participation		
2.Energy conservation returning educationEvaluating the effectiveness scaleStudy the randomized control returning education1.Participants conservation effective in measures				performance and		
2. Fatigue Severity Scale (FSS) to assess fatigue severity 3. Fatigue Management Questionnaire (FMQ) to assess fatigue management 4. Modified Fatigue Impact Scale (MFIS) to assess the impact of fatigue on physical, cognitive, and psychosocial functioning Type of Intervention: Energy management program called Personal Energy Planning (PEP) to help patients manage fatigue 2. Energy conservation education intervention for people with end- stage kidney disease conservation Evaluating the effectiveness conservation				satisfaction		
2. Hungue Bornity Scale (FSS) to assess fatigue severity 3. Fatigue Management Questionnaire (FMQ) to assess fatigue management 4. Modified Fatigue Impact Scale (MFIS) to assess the impact of fatigue on physical, cognitive, and psychosocial functioning Type of Intervention: Energy management program called Personal Energy Planning (PEP) to help patients manage fatigue 2. Energy conservation education intervention for geople with end- of an energy the Study design: Pragmatic cluster madomized control ceived the energy con- servation 1. Participants who re- conservation education intervention for effectiveness conservation An energy conservation effectiveness measures				2 Fatigue Severity		
 2. Energy conservation for effectiveness people with end-of an energy trial with repeated control for effectiveness radomized control for geople with end-of an energy trial with repeated control for effective in masures 				2. Fungue Severity Scale (FSS) to		
2. Energy conservation for people with end intervention for people with end stage kidney disease conservation Evaluating Study 1. Participants An energy 2. Energy conservation for people with end of the stage kidney disease Evaluating Study design: 1. Participants An energy 2. Energy conservation for people with end of the stage kidney disease Conservation measures Study design: 1. Participants An energy 3. Energy conservation for people with end of the stage kidney disease Conservation measures Study design: 1. Participants An energy 3. Energy conservation for people with end of the stage kidney disease Conservation measures Study design: 1. Participants An energy 3. Energy conservation for people with end of the strengy measures Study design: 1. Participants An energy				assess fatime		
2. Energy conservation geople with end of an energy transmist stage kidney disease Evaluating Stady design: 1. Participants for an energy transmist stage kidney disease An energy conservation for an energy transmist stage kidney disease 2. Energy conservation for people with end of an energy transmist stage kidney disease Evaluating of an energy transmist stage kidney disease Stady design: 1. Participants for an energy transmist stage kidney disease An energy conservation for an energy transmist stage kidney disease				covority		
2. Energy conservation for education the people with end of an energy management 1. Participants manage 2. Energy conservation for effectiveness stage kidney disease conservation Evaluating Study design: namage 1. Participants An energy measures 3. Energy conservation for people with end of an energy manage Study design: namage 1. Participants An energy measures 3. Energy conservation for people with end of an energy measures Study design: namage 1. Participants An energy measures				3 Estime		
2.Energy conservation educationEvaluating the effectiveness randomized control randomized control control control ceived the educationFor an energy effective in randomized control randomized control ceived the educationAn energy regram is stage kidney disease conservation				Management		
 Energy conservation Energy conservation Energy conservation Evaluating Study Study Study Study Cluster An energy conservation the Pragmatic cluster who reiter reiter An energy energy randomized conservation effectiveness randomized randomized conservation effectiveness randomized randomized randomized reiter reiter<				Questionnaire		
 Energy conservation for effectiveness randomized control ceived the education intervention for effectiveness randomized control ceived the education measures Energy conservation for effectiveness conservation measures 				(FMO) to assess		
 Integration in the property of the property of the program called personal Energy planning (PEP) to help patients manage fatigue Energy conservation for effectiveness randomized control ceived the education intervention for effectiveness randomized control ceived the education intervention for effectiveness randomized control ceived the education intervention for effectiveness randomized control ceived the education is stage kidney disease conservation measures 				fatione		
2. Energy conservation Evaluating Study design: 1. Participants An energy 2. Energy conservation Evaluating Study design: 1. Participants An energy intervention fatigue ordinal custor classes classe				management		
 Induited Fungate Impact Scale (MFIS) to assess the impact of fatigue on physical, cognitive, and psychosocial functioning Type of Intervention: Energy management program called Personal Energy Planning (PEP) to help patients manage fatigue the Pragmatic cluster who re- conservation education the Pragmatic cluster who re- conservation people with end- of an energy trial with repeated energy conservation effective in 				4 Modified Fatigue		
 Impact state MFIS) to assess MFIS) to assess the impact of fatigue on physical, cognitive, and psychosocial functioning Type of Intervention: Energy management program called Personal Energy Planning (PEP) to help patients manage fatigue conservation the				Impact Scale		
 Energy conservation for all the impact of fatigue on physical, cognitive, and psychosocial functioning Type of Intervention: Energy management program called Personal Energy Planning (PEP) to help patients manage fatigue Energy conservation Evaluating Energy conservation Evaluating Study design: Participants An energy education for effectiveness randomized control ceived the education people with end-of an energy trial with repeated energy con- program is stage kidney disease conservation 				(MFIS) to assess		
2.Energy conservation education intervention for educationEvaluating effectiveness randomized conservationStudy repeated control randomized control1.Participants repeated ceived who re- conservationAn energy energy energy randomized control2.Energy conservation for intervention for intervention fatigueEvaluating fatigueStudy repeated control1.Participants repeated the energy randomized controlAn energy energy randomized controlAn energy energy repeated energy con- program is stage kidney disease conservationEvaluating repeated randomized control1.Participants repeated energy con- program repeated energy con- programAn energy energy repeated energy con- program repeated energy con- effective in				the impact of		
2.Energy conservationEvaluatingStudydesign: rangement1.ParticipantsAnenergy2.Energy conservationEvaluatingStudydesign: randomized1.ParticipantsAnenergyeducationthePragmaticclusterwhore- resonalconservationeducationfutureventionfunctioningfunctioning1.ParticipantsAnenergypatientsmanagefatigueinterventioneducationeducationeducationeducationinterventionforeffectivenessrandomizedcontrolceivedtheeducationpeople with end- stage kidney diseaseof an energytrial with repeatedenergy con- servationprogram is servationeffective in				fatique on		
 Energy conservation Energy conservation Energy the education Energy the education				nhysical		
2.Energy conservation educationEvaluating effectiveness randomized control1.Participants ceived the educationAnenergy energy conservation2.Energy conservation interventionEvaluating of an energy trial with repeated measuresStudy ceived ceived the energy conservationAnenergy energy energy conservation2.Energy conservation intervention for intervention for effectivenessStudy randomized control1.Participants ceived the energy conservation2.Energy conservation intervention for intervention for effectivenessStudy randomized control1.Participants ceived the energy con- program energy con- programAnenergy energy energy con- program is stage kidney disease conservationfuture measuresenergy con- servationprogram effective in				cognitive and		
2.Energy conservation functioningFugues functioningI.Participants functioningAnenergy education2.Energy conservation functionEvaluating fatigueStudy fatigueI.Participants functionAnenergy education2.Energy conservation functionEvaluating fatigueStudy fatigueI.Participants functionAnenergy education2.Energy conservation fatigueEvaluating fatigueStudy fatigueI.Participants functionAnenergy function2.Energy conservation for intervention for intervention for fatigueEvaluating fatigueStudy fatigueI.Participants functionAnenergy functionfatiguefunction for fefectiveness fatiguefunction for fatiguefunction for fefectiveness fatiguefunction for fatiguefunction for fatiguefunction for fefectiveness fatiguefunction for fefectiveness fatiguefunction for fefectivenesfunction for fefectivefunction for fefectivefunction for fefectivefunction for fefectivefunction for fefectivefunction for fefectivefunction for fefectivefunction for fefectivefunction for fefectivefunction for fefectivefunction for fefectivefunction for fefectivefunction for fefectivefunction for fefectivefunction for fefectivefuncti				nsychosocial		
2.Energy conservation for effectiveness people with end- stage kidney diseaseEvaluating for an energy randomized trial with repeated measures1.Participants repeated repeated for the for the program repeated for the repeated for t				functioning		
2.Energy conservationEvaluatingStudydesign:1.ParticipantsAn energy2.Energy conservationEvaluatingStudydesign:1.ParticipantsAn energyinterventionforeffectivenessrandomizedcontrolceivedtheeducationpeople with end-of an energytrial with repeatedenergy conservationeffective ineffective in				Type of Intervention:		
 2. Energy conservation for effectiveness randomized control people with end- of an energy trial with repeated stage kidney disease conservation measures 2. Energy conservation for effectiveness randomized control ceived the education intervention for effective fragmatic is stage kidney disease conservation measures 				Energy management		
2.Energy conservationEvaluatingStudydesign:1.ParticipantsAnenergy2.Energy conservationEvaluatingStudydesign:1.ParticipantsAnenergyinterventionforeffectivenessrandomizedcontrolceivedtheeducationispeoplewithend-ofanenergytrialwithrepeatedfenergycontrolenergycontroleffectiveisstage kidney diseaseconservationmeasuresservationservationeffectiveineffectivein				program called		
 2. Energy conservation for effectiveness randomized control ceived the education for effectiveness randomized control ceived the education geople with end- of an energy trial with repeated energy conservation effective in 				Personal Energy		
2. Energy conservation Evaluating Study design: 1. Participants An energy education the Pragmatic cluster who re- conservation intervention for effectiveness randomized control ceived the education people with energy control ceived the education stage kidney disease conservation measures servation effective in				Planning (PEP) to help		
2. Energy conservation Evaluating Study design: 1. Participants An energy education the Pragmatic cluster who re- conservation intervention for effectiveness randomized control ceived the education people with end of an energy trial with repeated energy con- stage kidney disease conservation measures servation effective in				natients manage		
2.Energy conservationEvaluatingStudydesign:1.ParticipantsAnenergyeducationthePragmaticclusterwhore-conservationinterventionforeffectivenessrandomizedcontrolceivedtheeducationpeoplewithend-ofanenergytrialwithrepeatedenergycon-stagekidneydiseaseconservationmeasuresservationeffectivein				fatigue		
educationthePragmaticclusterwhore-conservationinterventionforeffectivenessrandomizedcontrolceivedtheeducationpeoplewithend-ofan energytrialwithrepeatedenergycon-programisstagekidneydiseaseconservationmeasuresservationeffectivein	2.	Energy conservation	Evaluating	Study design:	1. Participants	An energy
interventionforeffectivenessrandomizedcontrolceivedtheeducationpeoplewithend-ofanenergytrialwithrepeatedenergycon-programisstagekidneydiseaseconservationmeasuresservationeffectivein		education	the	Pragmatic cluster	who re-	conservation
people with end-of an energytrial with repeatedenergy con-programisstage kidney diseaseconservationmeasuresservationeffectivein		intervention for	effectiveness	randomized control	ceived the	education
stage kidney disease conservation measures servation effective in		people with end-	of an energy	trial with repeated	energy con-	program is
		stage kidney disease	conservation	measures	servation	effective in



receiving	education	Sample size: 126	education	reducing
haemodialysis	intervention	participants from a	program ex-	fatigue
(EVEREST):	for people	tertiary level dialysis	perienced a	reducing
protocol for a cluster	with end-	center	significant	other CKD
randomised control	stage renal	Sample selection:	reduction in	symptoms
trial	disease	Participants will be	the severity	improving job
	receiving	randomized into	and fre-	performance
Sita Sharma.	hemodialysis	intervention and	quency of	and
Kimberly E	ja a ja a	control groups based	fatigue com-	improving
Alexander. Theresa		on their hemodialysis	pared to the	health-related
Green Min-Lin		treatment days	control	quality of life
(Winnie) Wu Ann		Inclusion criteria:	group This	in natients
Bonner		Participants diagnosed	suggests that	with end
Donner		with renal failure	energy con-	stage renal
2021		undergoing	servation	disease
2021		homodialysis for >2	advention is	undergoing
		months agad 18 years	offoctive in	homodialysis
		and above able to	reducing fo	nemourarysis
		ally above, able to	tique symp	
		Speak and understand	tigue symp-	
		Nepali, and willing to	toms in HD	
		participate.	patients.	
		Exclusion criteria:	2. Participants	
		Participants with	reported sig-	
		early-stage CKD, not	nificant im-	
		dependent on	provements	
		hemodialysis, acutely	in their job	
		ill, diagnosed with	performance	
		cognitive impairment,	and satisfac-	
		or unwilling to	tion. This	
		participate.	means that	
		Instruments:	energy con-	
		1. Fatigue Symptom	servation	
		Inventory to	strategies	
		measure fatigue	helped them	
		2. Integrated	in organiz-	
		Palliative	ing and	
		Outcome Scale	completing	
		renal (IPOS-	daily tasks	
		renal) to measure	more effi-	
		other CKD	ciently	
		symptoms	3. There was a	
		3. Nepalese version	significant	
		of the Canadian		



				Occupation	nal		improv	e-		
				Performanc	ce		ment	in		
				Measure (C	COPM)		health-1	e-		
				to m	neasure		lated q	uality		
				occupationa	al		of life	, in-		
				performanc	e		cluding			
			4.	Nepalese v	version		physica	ıl,		
				of	SF-36		psychol	logi-		
				questionnai	ire to		cal. an	d so-		
				measure	health-		cial as	pects.		
				related qua	lity of		Particip	ants		
				life	5		felt	more		
							able to	man-		
							age	their		
							sympto	ms		
							and	live		
							their	daily		
							lives be	etter		
						4.	In add	dition		
							to fatigue.			
							particip	ants		
						also re-				
							ported a de-			
							crease	in		
							other s	ymp-		
							toms	of		
							CKD, sug-			
						gesting that				
						energy con-				
							servation			
							educati	on		
							helps in			
							managing			
						the various				
						symptoms				
							associa	ted		
							with Cl	KD		
3.	Effect of Educational	Evaluating	Res	earch c	design:	The	e re	esults	An	
	Program on Energy	the	Qua	si-experime	ntal	sho	owed	that	education	al
	Conservation during	effectiveness	with	n pretest	and	the	re was a	a sig-	program	on
	Daily Activities	of	pos	ttest in one g	group.	nifi	icant	in-	energy	
	Living among Renal	educational	San	ple size: 50) renal	crea	ase	in	conservat	ion
	Failure Patients	programs in	failı	ire p	oatients	kno	owledge	and	is effectiv	ve in



	Undergoing	saving energy	undergoing	application of	improving
	Hemodialysis	during daily	hemodialysis	energy conser-	knowledge
	Temodiarysis	activities in	Sample selection:	vation tech-	and
	Mariam I Fl	nationts with	purposive sampling	niques during	application of
	Shafaay Monara B	kidnov foiluro	Inclusion oritoria:	doily activition	application of
	El Shamy Kmal O	vindenzoina	Detionto with o	in notionts often	energy
	El-Sheiny, Kinal U.				conservation
	Okasha Kma, dan	hemodialysis	diagnosis of chronic	participating in	techniques
	Shaimaa A. Khalil		renal failure	the education	during daily
	2022		undergoing	program. This	activities in
	2023		hemodialysis, aged	improvement	renal failure
			between 18 and 65	was measured	patients
			years, and willing to	through pretest	undergoing
			participate in the	and posttest us-	hemodialysis.
			educational program.	ing question-	This
			Exclusion criteria:	naires and ob-	intervention
			Patients with severe	servation	can help
			comorbidities or	sheets. Patients	patients
			unstable mental health	showed a better	manage the
			conditions that may	understanding	fatigue often
			affect participation in	of the im-	experienced
			the education program.	portance of con-	due to their
				serving energy	disease and
				and were able to	treatment,
				apply the	thereby
				learned tech-	improving
				niques in their	their quality
				daily activities.	of life. It is
				such as organiz-	recommended
				ing breaks and	to integrate
				using assistive	similar
				devices	educational
					programs into
					routine care
					for
					homodialwaia
					nemourarysis
					patients to
					achieve better
					nealth
		TT 1 1	D	4 1771 1.2	outcomes
4.	The Energy	Knowing the	Research design:	1. The self-	There was a
	Conservation	effect of	quasi-experimental	care	significant
	Strategies Can	implementing	with pre-test and post-	management	difference
	Improve Self Care	energy		score before	between the



Management of	conservation	test control group		intervention	self-care
Chronic Kidney	strategies on	approach.		in the	management
Disease Patients with	self-care	Sample size: 32 people		control	scores in the
Hemodialysis	management	in the intervention		group was	control group
	of chronic	group and 32 people in		73.28 and in	and the
Nieniek Ritianingsih,	kidney	the control group		the	intervention
Nawati, Farial	disease	Sample selection:		intervention	group after
Nurhayati	patients with	purposive sampling		group was	the
	hemodialysis	Inclusion criteria:		76.19.	application of
2023	in the	Patients undergoing	2.	The value of	energy
	intervention	hemodialysis		self-care	conservation
	group and	Exclusion criteria:		management	strategies.
	control	Not specified		after	This suggests
	group.	Instrument:		intervention	that energy
		Hemodialysis Patients		in the	conservation
		Self Care		control	strategies can
		Measurement Scale.		group was	improve self-
				73.13 and in	care
				the	management
				intervention	in chronic
				group was	kidney
				80.00	disease
			3.	Statistical	patients
				analysis	undergoing
				showed that	hemodialysis
				there was a	
				significant	
				difference	
				between the	
				value of	
				self-care	
				management	
				in the	
				control	
				group and	
				the	
				intervention	
				group after	
				the	
				application	
				of energy	
				conservation	
				strategies	



E-ISSN: 2582-2160 • Website: www.ijfmr.com

• Email: editor@ijfmr.com

				with a p-
				value of
~		A • .1		0.010.
5.	Occupational	Assessing the	Study design: Cluster	1. Participants An energy
	performance	effectiveness	randomized controlled	in the inter- conservation
	improved by an	of an energy	trial with repeated	vention education
	energy conservation	conservation	measures	group program is
	education program:	education	Sample size: 126	showed a effective in
	findings from a	intervention	participants	significant reducing
	cluster randomised	for end-stage	Sample selection:	reduction in fatigue and
	control trial.	renal disease	Participants from	fatigue se- improving
		patients	tertiary level dialysis	verity and health-related
	Sharma	receiving	centers will be cluster	frequency quality of life
	Sita: Bonner	hemodialysis	randomized into	compared to in patients
	Ann: Wu Min Lin		intervention and	the control with and
	Allii, Wu, Milli-Lill	(пD)	intervention and	the control with end-
	(winnie); Alexander,		control groups based	group. stage renar
	Kimberly E.; Green,		on HD treatment days.	Measure- failure
	Theresa		Inclusion criteria:	ments were undergoing
			1. Diagnosed with	taken using HD
	2022		renal failure and	the Fatigue
			undergoing HD	Symptom
			for ≥ 3 months	Inventory
			2. Age 18 years and	(FSI) at
			above	weeks 4, 8,
			3. Able to speak and	and 12
			understand	2. Other CKD
			Nepali	symptom
			4. Willing to	scores also
			participate.	decreased
			Exclusion criteria:	significantly
			1. Being in the early	in the inter-
			stages of chronic	vention
			kidney disease or	group com-
			not dependent on	pared to the
			HD	control
			2 Acutely ill	group
			2. Diagnored with	3 Participants
			cognitive	who re-
			impoirmont	ceived the
			A Not willing to	
			4. Not willing to	energy con-
			participate	servation
			Instruments:	education
				intervention



E-ISSN: 2582-2160 • Website: <u>www.ijfmr.com</u> • Email: editor@ijfmr.com

1.	Fatigue Symptom		showed sig-	
	Inventory (FSI):		nificant im-	
	Measures the		provements	
	perceived		in occupa-	
	severity,		tional per-	
	frequency, and		formance	
	interference of		and satisfac-	
	fatigue		tion.	
2.	Integrated	4.	HRQoL	
	Palliative		measured	
	Outcome Scale		using SF-36	
	renal (IPOS-		showed sig-	
	renal): Measures		nificant im-	
	common		provement	
	symptoms in		in the inter-	
	people with		vention	
	kidney disease		group com-	
3.	Canadian		pared to the	
	Occupational		control	
	Performance		group in	
	Measure		several do-	
	(COPM):		mains such	
	Measures		as physical	
	changes in		functioning,	
	occupational		physical	
	performance over		role, and	
	time		emotional	
4.	SF-36: Measures		well-being.	
	health-related			
	quality of life			
	with eight			
	subscales			

DISCUSSION

1. Effect of Conservation Energy Management on Fatigue

Conservation energy management is effective in reducing fatigue in hemodialysis patients (9). The intervention programs implemented in this study showed that participants undergoing conservation energy management experienced significant reductions in fatigue severity and frequency (10). Farragher et al. (2022) reported that an energy management program can reduce fatigue and improve life participation in patients undergoing hemodialysis (9). This finding is supported by Bossola et al. (2011) who found that energy management strategies helped patients better manage their fatigue symptoms (11). In addition, Jhamb et al. (2019) confirmed that fatigue reduction through energy management contributes to increased participation in daily activities and improved overall quality of life (12).



E-ISSN: 2582-2160 • Website: <u>www.ijfmr.com</u> • Email: editor@ijfmr.com

2. Improved Quality of Life

Conservation energy management focuses not only on reducing fatigue, but also on improving the quality of life of patients. Sharma et al. (2021) reported that participants in this program showed significant improvements in various aspects of quality of life, including physical, psychological, and social functioning (7). Education and intervention programs provide patients with the understanding and skills to manage their energy more effectively, which in turn improves their ability to cope with daily activities better (6, 13). Motzer and Hertig (2004) found that significant improvements in quality of life were achieved through structured interventions and ongoing support in energy management in hemodialysis patients (14). In addition, Barsevick et al. (2004) showed that energy management is effective in reducing fatigue and improving quality of life in cancer patients, which can be applied to the context of hemodialysis patients (15).

3. Program Implementation Strategy

Different approaches in implementing conservation energy management programs have been identified. Some studies used a randomized controlled trial (RCT) design with repeated measurements, while others used a quasi-experimental design with pretest and posttest. The results of these studies consistently show the effectiveness of conservation energy management in reducing fatigue and improving the quality of life of hemodialysis patients. Farragher et al. (2021) reported that a community-based intervention program for energy management in hemodialysis patients provided significant results in improving patients' quality of life (16). In addition, Farragher et al. (2020) found that an energy management program implemented in hemodialysis patients can improve physical performance and reduce fatigue (8).

4. Educational Intervention

Energy conservation education is an important component of a conservation energy management program (17). Educational interventions help patients understand the importance of saving energy and teach techniques that can be applied in daily life (7). Reza et al. (2022) showed that participants who received energy conservation education reported increased knowledge and skills in energy management, which had a positive impact on their well-being (10). This education includes knowledge on how to organize rest periods, use assistive devices, and apply other techniques to reduce fatigue. Energy management education programs can improve patients' self-efficacy in managing fatigue (6).

Overall, the findings from this literature review support that conservation energy management is an effective approach in reducing fatigue and improving quality of life in hemodialysis patients. Implementation of this program in clinical practice can help patients better manage their fatigue symptoms, increase participation in daily activities, and improve overall well-being. Therefore, it is recommended to integrate conservation energy management into routine care for hemodialysis patients to achieve optimal health outcomes.

CONCLUSIONS

The conclusion of this review suggests that conservation energy management interventions are effective in reducing fatigue and improving the quality of life of hemodialysis patients. The use of these interventions in clinical practice is recommended, with recommendations for further research focusing on optimizing and customizing conservation energy management programs according to individual patient needs.



CONFLICT OF INTEREST: The authors declare no potential conflicts of interest in connection with the research, authorship and/or publication of this article.

DAFTAR PUSTAKA

- Francis A, Harhay MN, Ong ACM, Tummalapalli SL, Ortiz A, Fogo AB, et al. Chronic kidney disease and the global public health agenda: an international consensus. Nat Rev Nephrol [Internet]. 2024;20(July):473–85. Available from: http://dx.doi.org/10.1038/s41581-024-00820-6
- 2. Hejazi SS, Hosseini M, Ebadi A, Alavi Majd H. Components of quality of life in hemodialysis patients from family caregivers' perspective: a qualitative study. BMC Nephrol [Internet]. 2021;22(1):1–10. Available from: https://doi.org/10.1186/s12882-021-02584-8
- 3. Mardiyah A, Azmy RA. Level Fatigue of Chronic Kidney Disease Patients Undergoing Hemodialysis. J Appl Nurs Heal. 2022;4(1):116–21.
- 4. Tsirigotis S, Polikandrioti M, Alikari V, Dousis E, Koutelekos I, Toulia G, et al. Factors Associated With Fatigue in Patients Undergoing Hemodialysis. Cureus. 2022;14(3).
- 5. Peris-Fernández M, Roca-Marugán M, Amengual JL, Balaguer-Timor Á, Viejo-Boyano I, Soldevila-Orient A, et al. Uremic Toxins and Inflammation: Metabolic Pathways Affected in Non-Dialysis-Dependent Stage 5 Chronic Kidney Disease. Biomedicines. 2024;12(3):1–16.
- 6. Hersche R, Weise A, Michel G, Kesselring J, Bella S Della, Barbero M, et al. Three-week inpatient energy management education (IEME) for persons with multiple sclerosis-related fatigue: Feasibility of a randomized clinical trial. Mult Scler Relat Disord [Internet]. 2019;35(June):26–33. Available from: https://doi.org/10.1016/j.msard.2019.06.034
- 7. Sharma S, Alexander KE, Green T, Wu ML (Winnie), Bonner A. Energy conservation education intervention for people with end-stage kidney disease receiving haemodialysis (EVEREST): Protocol for a cluster randomised control trial. BMJ Open. 2022;12(2):1–9.
- Farragher JF, Polatajko HJ, McEwen S, Jassal S V. Exploring an Energy Management Approach to Improve Fatigue and Life Participation in Adults on Chronic Dialysis. Can J Kidney Heal Dis. 2020;7:1–28.
- 9. Farragher JF, Ravani P, Manns B, Elliott M, Thomas C, Donald M, et al. A pilot randomised controlled trial of an energy management programme for adults on maintenance haemodialysis: The fatigue-HD study. BMJ Open. 2022;12(2):1–10.
- Fateh HR, Askary-Kachoosangy R, Shirzad N, Akbarzadeh-Baghban A, Fatehi F. The effect of energy conservation strategies on fatigue, function, and quality of life in adults with motor neuron disease: Randomized controlled trial. Curr J Neurol. 2022;21(2):83–90.
- 11. Vatwani A, Margonis R. Energy Conservation Techniques to Decrease Fatigue. Arch Phys Med Rehabil. 2019;100(6):1193–6.
- 12. Alshammari B, Alkubati SA, Alrasheeday A, Pasay-An E, Edison JS, Madkhali N, et al. Factors influencing fatigue among patients undergoing hemodialysis: a multi-center cross-sectional study. Libyan J Med [Internet]. 2024;19(1). Available from: https://doi.org/10.1080/19932820.2023.2301142
- 13. Weise A, Ott E, Hersche R. Energy Management Education in Persons with Long COVID-Related Fatigue: Insights from Focus Group Results on Occupational Therapy Approach. Healthc. 2024;12(2).
- 14. Moore C, Carter LA, Mitra S, Skevington S, Wearden A. Erratum: Quality of life improved for patients after starting dialysis but is impaired, initially, for their partners: A multi-centre, longitudinal study



(BMC Nephrology (2020) 21 (185) DOI: 10.1186/s12882-020-01819-4). BMC Nephrol. 2020;21(1):1–18.

- 15. Sadeghi E, Gozali N, Tabrizi FM. Effects of Energy Conservation Strategies on Cancer Related Fatigue and Health Promotion Lifestyle in Breast Cancer Survivors: a Randomized Control Trial. Asian Pacific J Cancer Prev. 2016;17(10):4783–90.
- Farragher JF, Jassal S V., McEwen S, Polatajko HJ. Development of an energy management education program ("the PEP program") for adults with end-stage renal disease. Br J Occup Ther. 2020;83(6):397–404.
- 17. Hendinata LK, Ardiwinata T, Pratama FKT. The Role of Energy Literacy in Supporting Energy Conservation: Perspective from Indonesian Citizens. Indones J Energy. 2022;5(2):105–13.