EDUCATIONAL PROGRAMS TO IMPROVE FLUID RESTRICTION COMPLIANCE AND INTERDIALYTIC WEIGHT GAIN IN HEMODIALYSIS PATIENTS: A SYSTEMATIC REVIEW

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Abstract

Backgrounds; Chronic Kidney Disease (CKD) is a global health problem considered a major cause of the increasing prevalence of non-communicable diseases worldwide. One treatment option is hemodialysis. A significant issue for HD patients is fluid restriction and Intradialytic Weight Gain (IDWG). Educational programs provided to HD patients have a positive impact on fluid restriction compliance. The success of fluid restriction can be assessed by measuring IDWG.. **Objectives**; A systematic review was conducted to evaluate the use of educational programs to improve fluid restriction compliance and IDWG in CKD patients undergoing hemodialysis. **Methods**; This study followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, taking into account four stages: identification, selection, eligibility assessment, and inclusion. **Results;** A total of 14 studies were included in this systematic review, all of which implemented educational programs using various methods with outcomes aimed at improving fluid restriction compliance and IDWG in CKD patients undergoing hemodialysis. Nine studies were experimental studies, and five were randomized controlled trials. **Conclusions**; This review shows significant potential in applying educational programs using various methods to improve fluid restriction compliance and IDWG. Educational program strategies using various methods can be implemented in the care of CKD patients undergoing hemodialysis.

Keywords*:* Chronic Kidney Disease AND hemodialysis patients, Health Education Program , Fluid restriction compliance and Intradialytic Weight Gain

BACKGROUND

Chronic Kidney Disease (CKD) is problem considered global health as contributor main to prevalence disease No infectious in the world (Luyckx et al., 2018) . CKD affects about 13% of global population , and level death as a result Keep going increasing , especially in developing countries (Bikbov et al., 2020) . Estimated that the total number of individuals affected by CKD stages 1–5 worldwide at this time This reach around 843.6 million people (Kovesdy, 2022) . In 2018 , the prevalence of CKD in Indonesia increased enhancement to 0.38%, which is equivalent with around 713,783 people. One of possible actions made choice is action hemodialysis .

Hemodialysis (HD) becomes type most therapy applied after transplant , okay in incident *nor* prevalence (Castaño et al., 2023) . In Indonesia, HD became method the most common treatment used . According to report Indonesian Renal Registry (IRR) 2017 , available a total of 77,892 patients underwent HD therapy active in the year the (IRR, 2018) . HD is method applied For increase function affected kidney failure permanent . (IRR, 2018) . Problem common frequently faced by patients who undergo associated HD therapy with not enough obedient in consuming fluid .

Patients undergoing HD should comply with restrictions tight fluid (Hunter et al., 2023) . Many of patients undergoing HD have history Disobedient to restrictions fluid , (Nadri et al., 2020) . Obedience HD patients against restrictions recommended fluid Still low (Beerendrakumar et al., 2018). Success management intake fluid can assessed through measurement Intradialytic Weight Gain (IDWG) (Priska, 2019) . IDWG is an increase in the volume of fluid manifested through enhancement weight , and this used as indicator For measure extent of fluid accumulated during period between session dialysis (Gultom et al., 2022) . IDWG has connected with a number complications in patients undergoing HD (Maimani et al., 2021) . Complications the cause often patient must treated at home Sick with level more deaths tall (Özkan et al., 2022) . For overcome problem this is necessary exists more effort intensive For increase obedience to restrictions liquid .

Obedience restrictions fluid can improved through education . Approach holistic that includes support strong social and effective education very important in help deep HD patients face and obey restrictions fluids and diet are necessary For guard health (Sukarrini et al., 2022) . Education provided to HD patients have impact positive to level obedience they to diets and restrictions fluid (Başer et al., 2019) .

A number of study has done about education dietary compliance and restrictions fluids in HD patients . Among them research conducted by Dsouza et al., (2023) state that group intervention experience much improvement more big in knowledge about management disease , compliance to restrictions fluids , and compliance to pattern Eat If compared to with group control . Study Another was conducted by Zheng et al., (2023) which stated that management mode team nursing new can increase level compliance , self-efficacy , and quality life patient with CKD disease Because of Therefore , there *is a need for educational programs in overcome obedience restrictions fluids and IDWG.*

METHODS

1. Study Design

   A review systematic done For evaluate implementation of the educational program used in frame increase obedience restrictions fluids and IDWG in CKD patients undergoing hemodialysis . Overview This consider PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) norms , with considers 4 phases : Identification , Selection , Eligibility , and Inclusion (Shamseer et al., 2015) .

2. Search Strategy

Original research based on PICO (Population, Intervention, Comparators, and Outcomes).

Table 1. PICO criteria for inclusion in the systematic review

Parameter	Inclusion Criteria
Population	*Chronic Kidney Disease AND hemodialysis patients*
Intervention	Health Education Program
Comparators	-
Outcomes	Fluid restriction compliance and *Intradialytic Weight Gain*

In search relevant studies , author do search article published in English between 2014 until by 2023. A number of electronic databases that the author use including , Cumulative Index for Nursing and Allied Health Literature (CINAHL), Scopus, PubMed, ProQuest (including the ProQuest Dissertation and Theses Database), Google Scholar, and Sciencedirect. Writer using the keywords " Chronic *Kidney Disease* " or " *hemodialysis patients* " and "Health Education Program" and " *fluid restriction and Intradialytic Weight Gain* ". Reference list and bibliography from studies found were also searched . Literature gray is obtained from articles that have been there is also use as literature.

3. Selection Criteria

Election article done by two independent reviewer with notice criteria inclusion including : (1) Articles *Randomized Controlled Trial* (RCT) ; (2) Experimental Study Articles (3) Articles with educational program intervention health ; (4) Articles published 10 years old last (5) Articles containing compliance outcomes restrictions fluids and IDWG. Critical exclusion including (1) Qualitative Design Study ; (2) Review Article ; (3) Study without intervention education health.

4. Data extraction

Data collection from study to be entered in review systematic carried out by the author in a way independent after move article to in device soft review data management systematic (*Rayyan*). This matter aim For ensure that all data has been obtained . After the article fulfil condition For Final inculcation then article will be analyzed use application *Elicit* . Analysis results articles in *Elicit* will be exported to *Microsoft Excel* for gather relevance datafor analyzed furthermore . Writer collect information form Name researcher , year publication , country of origin , design study , aims, sample , design intervention education , outcomes, results and conclusions.

5. Quality Assessment

Writer evaluate selected studies use *Critical Appraisal Skills Program RCT* and *Experimental Study* (Sterne et al., 2019). We do evaluation to a number of aspects, such as the randomization process , deviation from intervention , missing outcome data, measurement results , and elections reported results . Each domain is assessed as low risk of bias , no risk of bias clear , or high risk of bias . If there are insufficient information Enough For rated , we contact writer . If not There is response from writer for 14 days , we evaluated the available data . Every difference opinion between two evaluator resolved through discussion and examination by the assessor other .

6. Data synthesis and statistical analysis

Review systematic This adopt approach synthesis narrative , following framework suggested by *the Center For Reviews and Dissemination* , (2009) . Decision to No conduct meta- analysis taken Because exists heterogeneity among included studies. Figure 1 illustrates stages identification and selection study.

RESULTS AND DISCUSSION

1. Search Results

   Search identified a total of 552 articles : 532 of electronic database searches , and 20 of manual search . After doing a duplicate filter article so left out 486 articles . Sorting abstract and title result exclusion of 361 articles excluded , so leaving 125 articles . Filter by criteria inclusion and exclusion so leaving 44 article . For filtering text full , 30 articles considered after reading text full . By overall , 14 articles entered in analysis end . Figure 1 depicts the retrieval process literature . Characteristics included research presented in Table 2.
2. Quality Assessment Results

   Quality Assessment using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Experimental Studies and Randomized controlled trial. Evaluation tool JBI has been critical designed by JBI and colleagues . Iteration special from tool This has developed by the JBI Effectiveness Methods Group with guidance from Committee JBI Scientific . Like version previous , version latest This presenting question marker For help evaluator recognize is steps certain bias safeguards has considered in moderate primary literature reviewed . However , in difference with version previous , version latest has organize questions become three category : validity internal, external , or conclusions statistics . Related questions with Internal validity has also been grouped based on the domain of bias addressed . Additionally, tools This has arranged in a way more structured For makes it easier evaluation is biased at various levels level (e.g. , bias at level results or biased in level results). After passing extensive peer review through Committee JBI Scientific , tools This has Approved .

   In this review 9 articles use Critical Appraisal Checklist for Experimental Studies (Table 3) and 5 articles use Randomized controlled trial, where for experimental studies there are 4 articles that meet 8 of the 9 criteria (Parker, (2019) , Rosdiana et al., (2018) , Shaker et al., (2017) , Sharaf, (2016)) and there are 5 articles that meet 9 criteria (Fauzi & Oktaviani, (2022) , Fadlalmola & Elkareem, (2020) , Nadri et al., (2020) , Başer et al., (2019) , Alikari et al., (2019)) . Whereas For There are 2 Randomized controlled trial articles meets 10 of 13 criteria (Arad et al., (2021) , Griva et al., (2018)), only there is 1 article that meets 9 of the 13 criteria (Dsouza. et al., 2023) . And last there were 2 articles that met 8 of the 13 criteria (Irajpour et al., (2024) , Torabikhah et al., (2023)). Explanation more carry on can be seen in table 4.

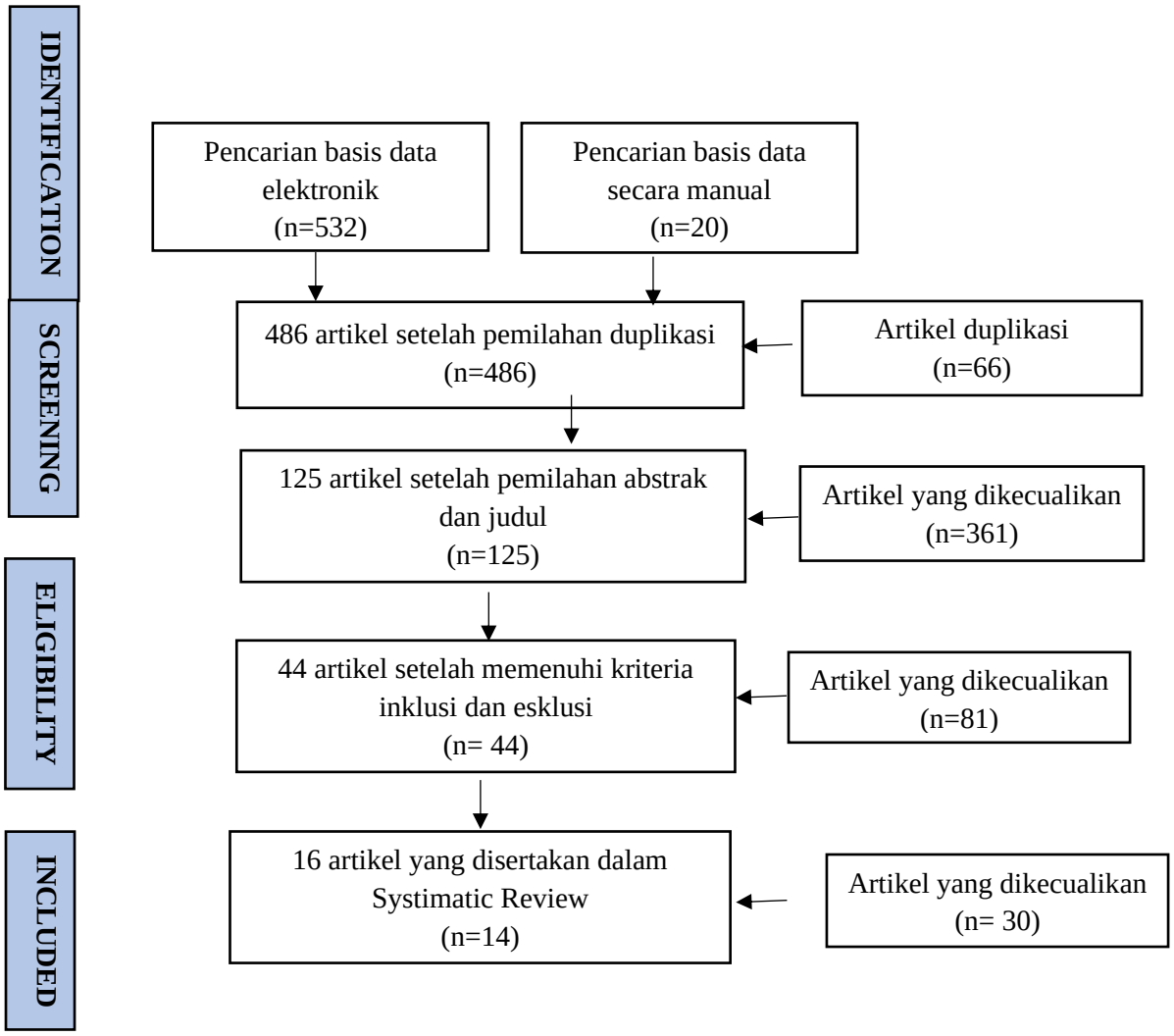

Figure 1. Flow diagram search article

3. Characteristics of the studies

Article which include as much four mercy published articles between 2016 until by 2024. From various countries in the world including Iran, India, Indonesia, Sudan , Morocco , Turkey, Australia, Greece, UK and Egypt. All article do intervention in the form of educational programs Mostly article using Quasi Experimental , namely a total of 9 articles , 5 article use method Randomized controlled trial. Characteristics complete from studies , incl type intervention , types control , and duration follow further , overall article show that There is enhancement obedience restrictions fluid and decreased IDWG after provided educational programs with various method every the article , shown in Table 2.

4. Review Results

We target For identify educational programs provided to HD patients . We classified 14 articles this is the case in all CKD patients undergoing HD. Whole article with population CKD patients undergoing HD as well do intervention in the form of an educational program with compliance outcomes restrictions fluids , diet compliance , compliance treatment and IDWG in HD patients .

As an outcome obtained from to 14 articles This have positive results for HD patients where educational programs with various models are set out in each article can increase obedience restrictions fluids , diet compliance , compliance treatment and IDWG in HD patients . All 14 articles This have diverse samples variety start from 17 participants (Parker,

2019) and the most namely 160 participants (Dsouza. et al., 2023) , whose sample shared into 2 groups ie group interventions and groups control consists of 10 articles and that only has 1 group of 4 articles.

4.1 Education Program

Educational programs provided with various method including : Training patients by group peers (Irajpour et al., 2024) , giving education and booklets (Dsouza. et al., 2023) , use application mobile health (In Care) and training stare face (Torabikhah et al., 2023) , hemodialysis diet education program (Fauzi & Oktaviani, 2022) , educational program patient and follow up carry on telephone (Arad et al., 2021), implementation of patient education programs hemodialysis (Fadlalmola & Elkareem, 2020) , educational program to obedience to dietary measures and restrictions fluid (Nadri et al., 2020).

Nutrition education book For dialysis patients (Başer et al., 2019) , education on improvement knowledge patient about hemodialysis base about diet and fluid management (Parker, 2019), education and booklets (Alikari et al., 2019), education towards IDWG (Rosdiana et al., 2018), training program management self interactive and oriented (HED-SMAR); HED-SMART (Griva et al., 2018), guideline developed nutrition to enhancement weight between sessions on patients hemodialysis (Shaker et al., 2017), and education to obedience patient hemodialysis to restrictions fluid and sodium (Sharaf, 2016). All educational programs on produce good outcomes for patient

4.2 Obedience Restrictions Fluid

From all 14 articles This there are 10 articles focused For increase compliance restrictions fluid after carrying out educational programs . Education by groups peer increase obedience patient to consumption fluid in the interval between two dialysis session (Irajpour et al., 2024) . Intervention education can increase knowledge and obedience to patients hemodialysis in India, one of them is obedience fluids and diet (Dsouza. et al., 2023) . Education programs patient and follow up carry on call led by a nurse own impact significant to obedience treatment to patients hemodialysis is one of them is restrictions fluids , and dietary recommendations (Arad et al., 2021) . Educational program effective in increase knowledge patient about hemodialysis and quality live , this program covers information about draft hemodialysis , treatment access vascular disease , complications , diet and fluid restrictions (Fadlalmola & Elkareem, 2020). education programs own impact positive on compliance patient to dietary measures and restrictions fluid (Nadri et al., 2020). Training provided to patient hemodialysis give contribution positive to obedience they to diet and fluid restrictions (Başer et al., 2019) , Education helps patient increase knowledge Diet and fluid management , so help obedience to restrictions fluid (Parker, 2019). Intervention education can increase knowledge , compliance , and quality life (Alikari et al., 2019). HED-SMART provides an effective and practical model For increase health in patients hemodialysis . Observed improvements in marker clinical and compliance (Griva et al., 2018). Intervention education for patients who undergo it hemodialysis cause enhancement obedience to restrictions fluid and sodium (Sharaf, 2016).

Evaluation obedience restrictions liquid on all article use existing questionnaire validated Results are measured with reliable way use validated tools , Questionnaires Obedience Disease End Stage Renal (ESRD-AQ), which has confirmed its reliability and validity in study previously.

4.3 Intradialytic Weight Gain

From all 14 articles there are 5 articles that focus For lower enhancement inter body weight dialysis session . Use application mobile health (Di Care) online significant reduce enhancement inter body weight dialysis session (Torabikhah et al., 2023) . There is difference significant in addition intradialysis body weight between group interventions and groups control (Fauzi & Oktaviani, 2022) . patient education hemodialysis can own influence positive towards IDWG (Rosdiana et al., 2018). Guidelines developed nutrition own effect positive in increase knowledge patient hemodialysis and reducing enhancement weight between session (Shaker et al., 2017). Intervention education for patients who undergo it

hemodialysis cause enhancement obedience to restrictions fluids and sodium, as is proven with decline enhancement Interdialysis weight and value pressure blood (Sharaf, 2016).

Table 2. Characteristics of included studies

Writer Year	Title	Country	Study design	Research purposes	Sample	Intervention Education	Conclusion
Irajpour et al., (2024)	The Effects of Peer Education on Treatment Adherence among Patients Receiving Hemodialysis : A Randomized Controlled Trial	Iran	Randomized controlled trial.	Evaluate effect education peer to obedience treatment in between receiving patients hemodialysis .	The sample consists of 76 patients selected in a way random of the 85 patients who complied condition . They chosen from center Noor hemodialysis and Hazrat Ali Asghar Hospital	Intervention in study This involve training patients by group peer . Leaders group accept training a total of 8 sessions (12 hours) for increase knowledge and information they before start practice patient other . They given package training which contains a training manual and workshop CD for strengthen information provided to patient other	Education by groups peer increase obedience patient to consumption fluid in the interval between two session dialysis .
Dsouza. et al., (2023)	Effect of Educational Intervention on Knowledge and Level of Adherence among Hemodialysis Patients: A Randomized	India	Randomized controlled trial.	Study This aim For show results positive in knowledge patient and level obedience	In research Currently , there are 160 patients shared hemodialysis become two group : group interventions and groups control ,	Intervention in study This involve giving education and booklets to group intervention , temporary group control accept maintenance standards at the center dialysis	Study This find that intervention education can increase knowledge and obedience to patients hemodialysis in India. Obedience increase in matter HD presence , duration , and shortening episodes , as well
	Controlled Trial				each consisting of 80 patients		obedience fluids and diet. This study own limitations like measurement Subjective compliance and lack thereof intervention psychological / affective . By overall , study This show results positive in obedience through evaluation subjective .
Torabikhah et al., (2023)	Comparing the effects of mHealth app use and face-to-face training on the clinical and laboratory parameters of dietary and fluid intake adherence in hemodialysis patients: a randomized clinical trial	Iran	Randomized controlled trial.	Research purposes This is For compare effectiveness use application mobile health (In Care) with training stare advance in increase obedience to Diet and fluid restrictions in patients hemodialysis .	A total of 70 patients hemodialysis recruited in study This use convenience sampling method	In research here , there is two type interventions carried out , namely use application mobile health (In Care) and training stare advance	Research result show that use application mobile health (Di Care) online significant reduce enhancement inter body weight session hemodialysis (IDWG) and improve levels of potassium, phosphorus , total cholesterol , triglycerides , and ferritin in blood compared to with training stare face . Second group show enhancement in obedience to treatment , however group application own more results Good in IDWG terms and rates triglycerides . Apps also help in monitor and record patient data For study more carry on . By Overall , the Di Care application is

							proven become effective tool in increase obedience to Diet and fluid restrictions in patients hemodialysis .
Fauzi & Oktaviani, (2022)	Effects of a Hemodialysis Diet Education Program on Hemodialysis Patients	Indonesia	Quasi Experimental pre- posttest with group control .	The purpose of study This is For evaluate effect from the hemodialysis diet education program recurring in patients hemodialysis .	Research sample consists of the 19 participants divided become group interventions and groups control . Group intervention consists of 10 participants . whereas group control consists from 9 participants . The convenience sampling method was used For election respondents	Intervention in study This is a hemodialysis diet education program given repeatedly to group intervention for 8 weeks . with session education done four times a week for 15 minutes every session .	Study This find that program cause enhancement Dietary knowledge and compliance maintenance yourself in between patient . Apart from that , there are difference significant in addition intradialysis body weight between group interventions and groups control . Study This recommend that educational program repeated can help prevent complications in patients hemodialysis
Arad et al., (2021)	Do the patient education program and nurse-led telephone follow-up improvement	Iran	Randomized controlled trial.	The purpose of study This is For evaluate effect from educational programs patient and follow up carry on call led by a nurse to obedience treatment to patients	Study This involving 66 divided participants become two group , that is group control (n = 33) and group intervention (n = 33)	Intervention in study This includes educational programs patient and follow up carry on call led by a nurse for 3 months . Participants in groups intervention receive educational programs patient through message text every days and	Research result show that educational program patient and follow up carry on call led by a nurse own impact significant to obedience treatment to patients hemodialysis . Group intervention show significant improvement in obedience to presence
	treatment adherence in hemodialysis patients? A randomized controlled trial			hemodialysis . Study This aim For show that implementation intervention the can increase obedience treatment to patients hemodialysis .		contacts telephone twice a week for 20 minutes	session hemodialysis . uses medication , restrictions fluids , and dietary recommendations were compared with group control.
Fadlalmola & Elkareem, (2020)	Impact of an educational program on knowledge and quality of life among hemodialysis patients in Khartoum state	Sudan	Quasi-experimental study with a pre- and posttest design	The purpose of study This is For evaluate effectiveness from an educational program to knowledge and quality life patient hemodialysis in Khartoum state, Sudan.	Amount sample as many as 100 patients fail kidney chronic undergoing hemodialysis routine involved in study This	Intervention in study This covers implementation of educational programs for patients hemodialysis For increase knowledge and quality life they . This program covers information about draft hemodialysis . treatment access vascular disease , complications , diet and fluid restrictions , medication , and activity For help patient adapt with disease and treatment	The result show enhancement knowledge and improvement quality significant life after program implementation . Educational program effective in increase knowledge patient about hemodialysis and quality life . The writers recommend implementation of a similar program in hemodialysis units For ensure patient own knowledge about disease them and their management .

Nadri et al., (2020)	Effect of a hemodialysis patient education on fluid control and diet	Morocco	Prospective, single- center randomized study	The purpose of study This is For evaluate contribution from implementation of educational programs to obedience to dietary measures and restrictions fluid.	Study done against 50 people, divided into 2 groups namely a group of 25 people intervention and 25 person groups control	Group intervention receive educational programs , meanwhile No there are educational programs in place For group control	Study This show that implementation of educational programs own impact positive on compliance patient to dietary measures and restrictions fluid .
Başer et al., (2019)	The effect of a hemodialysis patient education program on fluid control and dietary compliance	Turkey	Quasi Experimental pre- posttest with control group	For see chief restrictions diet and fluids after done training and nutrition education for patient dialysis	Study done with 78 people consisting from group intervention (N = 38) group controls (N = 40).	Participant group intervention given "Nutrition Education Book For Patient Dialysis ". Participants in group intervention trained through four session education for 4 months and tools measurement given to they. Participant in group control interviewed twice , once at the start research and 2 months very then and tools measurement given to they .	Training provided to patient hemodialysis give contribution positive to obedience they to diet and fluid restrictions , Obedience patient to diets and restrictions fluid increase.
Parker, (2019)	Use of an Educational Intervention to	Australia	Quasi Experimental Pre-test/post-test	For know effectiveness intervention education	20 patients agree For participate and sign agreement .	Interventions carried out is intervention education on improvement knowledge patient	Research result show that intervention education help patient increase knowledge
	Improve Fluid Restriction Adherence in Patients on Hemodialysis			on improvement knowledge patient about hemodialysis base about Diet and fluid management .	17 patients finish study .	about hemodialysis base about Diet and fluid management .	Diet and fluid management , so help obedience to restrictions fluid .
Alikari et al., (2019)	The impact of education on knowledge, adherence and quality of life among patients on hemodialysis	Greece	quasi-experimental interventional study	The purpose of study This is For evaluate impact intervention education to level knowledge , quality life (QoL), and compliance to the treatment regimen in between patient hemodialysis (HD), as well For describe connection between variables.	50 patients hemodialysis in a center hemodialysis in West Attica random shared become group intervention 25 patients and groups control 25 patients	Interventions given to groups intervention ie accept education and booklets while in groups control only accept booklet	Intervention education can increase knowledge , compliance , and QoL (quality live) among HD (hemodialysis) patients . Enhancement level knowledge No relate with enhancement obedience . However , improvement obedience can increase a number of QoL dimensions .
Rosdiana et al., (2018)	The effect of education on interdialytic weight gain in patients undergoing hemodialysis	Indonesia	Quasi-experimental method, with a pretest and posttest group design without a control group.	Study This aim For explain effect education against IDWG.	Amount sample study were 34 respondents with technique taking purposive sampling sample .	Respondent given 3 sessions education with different material in each sessions and body weight were observed during two Sunday after session education end	Research result show that patient education hemodialysis can own influence positive against IDWG.

Griva et al., (2018)	Hemodialysis Self-Management Intervention Randomized Trial (HED-SMART): A Practical Low- Intensity Intervention to Improve Adherence and Clinical Markers in Patients Receiving Hemodialysis	UK	Randomized controlled trial.	Study This aim For know Serum potassium and phosphate concentrations , increased weight between dialysis (IDWG) , reported compliance yourself , and skills management self at 1 week , 3 months , and 9 months after intervention .	Deep sample study This consists of 235 participants from group intervention 134 samples and groups control 101 samples	Training program management self interactive and oriented (HED-SMAR); HED-SMART, developed use principles solution problems and theories learning social , delivered in group format by professionals health for 4 sessions .	HED-SMART provides an effective and practical model For increase health in patients hemodialysis . Observed improvements in marker clinical and compliance based on report self , if maintained on monitoring period long , yes in a way significant reduce associated complications with disease end stage kidney . Remember feasibility of such a program this , he own potency big For complete maintenance normal .
Shaker et al., (2017)	Effect of Developed Nutritional Guidelines on Interdialytic Weight Gain among Hemodialysis Patients	Egypt	Quasi experimental study	The purpose of study This is For evaluate effect guidelines developed nutrition to enhancement weight between sessions on patients hemodialysis .	Study carried out at the New Mansoura General Hospital. The sample consisted of 70 patients hemodialysis mature	Two tools used in study This . Tool 1 ; Assessment Sheet Nutrition , tools This consists from three part as following : characteristics demographics , Knowledge Patient Hemodialysis Related	Research result show enhancement significant in knowledge patient hemodialysis about guidelines developed nutrition . There is decline significant in index average score mass body , increase weight between session , and serum sodium. There is
						Guidelines Nutrition and measurements anthropometry . Tool to 2: Assessment Sheet Interdialysis Weight Gain . This tool consists from three part as following : Measurement Interdialysis Weight Gain , Symptoms Excess Fluids and Investigations Laboratory Biochemistry . This includes two element like serum sodium (Na) levels and serum potassium (K) levels .	enhancement significant in obedience liquid in between patient hemodialysis after implementation guidelines developed nutrition . Study conclude that implementation guidelines developed nutrition own effect positive in increase knowledge patient hemodialysis and reducing enhancement weight between session .
Sharaf, (2016)	The impact of educational interventions on hemodialysis patients' adherence to fluid and sodium restrictions	Egypt	Q *uation-experimental study*	The purpose of study This is For investigate effect intervention education to obedience patient hemodialysis to restrictions fluid and sodium.	Data is collected of the 45 patients who underwent hemodialysis routine for a minimum of 6 months	Intervention education done in 3 sessions in a row . One month after education , these parameters estimated repeat .	Intervention education for patients who undergo it hemodialysis cause enhancement obedience to restrictions fluids and sodium, as is proven with decline enhancement Interdialysis weight and value pressure blood.

Table 3 Quality Appraisal Using Joanna Briggs Institute Critical Appraisal Checklist for Experimental Studies.

Quality Criteria	Fauzi & Oktaviani, (2022)	Fadlalmola & Elkareem, (2020)	Nadri et al., (2020)	Başer et al., (2019)	Parker, (2019)	Alikari et al., (2019)	Rosdiana et al., (2018)	Shaker et al., (2017)	Sharaf, (2016)
1. Is it clear in the study what is the 'cause ' and what is the 'effect' (ie there is no confusion about which variable comes first)?	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Were the participants included in any comparisons similar?	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or intervention of interest?	✓	✓	✓	✓	✓	✓	✓	✓	✓
4. Was there a control group?	✓	✓	✓	✓	X	✓	X	X	X
5. Were there multiple measurements of the outcome both pre and post the intervention/exposure?	✓	✓	✓	✓	✓	✓	✓	✓	✓
6. Was follow up complete and if not, were differences between groups in terms of their follow up thoroughly described and analyzed ?	✓	✓	✓	✓	✓	✓	✓	✓	✓
7. Were the outcomes of participants included in any comparisons measured in the same way?	✓	✓	✓	✓	✓	✓	✓	✓	✓
8. Are outcomes measured in a reliable way?	✓	✓	✓	✓	✓	✓	✓	✓	✓
9. Was appropriate statistical analysis used?	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 4 Quality Appraisal Using Joanna Briggs Institute Critical Appraisal Checklist for Randomized controlled trial.

Quality Criteria	Irajpour et al., (2024)	Dsouza. et al., (2023)	Torabikhah et al., (2023)	Arad et al., (2021)	Griva et al., (2018)
Bias related to selection and allocation					
1. Was true randomization used for assignment of participants to treatment groups?	✓	✓	✓	✓	✓
2. Was allocation to treatment groups concealed?	X	✓	X	✓	✓
3. Were treatment groups similar at the baseline?	✓	✓	✓	✓	✓
Bias related to administration of intervention/exposure					
4. Were participants blind to treatment assignment?	X	X	X	X	X
5. Were those delivering the treatment blind to treatment assignment?	X	X	X	X	X
6. Are treatment groups treated identically other than the intervention of interest?	X	X	X	X	X
Bias related to assessment, detection and measurement of the outcome					
7. Are outcome assessors blind to treatment assignment?	X	X	X	✓	✓
8. Are outcomes measured in the same way as treatment groups?	✓	✓	✓	✓	✓
9. Were outcomes measured in a reliable way	✓	✓	✓	✓	✓
Bias related to participant retention					
10. Was follow up complete and if not, were differences between groups in terms of their follow up thoroughly described and analysed?	✓	✓	✓	✓	✓
Statistical Conclusion Validity					
11. Were participants analyzed in the groups to which they were randomized?	✓	✓	✓	✓	✓
12. Was appropriate statistical analysis used?	✓	✓	✓	✓	✓

Overview systematic This from experimental study articles and RCTs that focus on educational programs For increase obedience restrictions fluid and IDWG in CKD patients undergoing HD. From research said said that educational program with various method in each the article can increase compliance restrictions fluid and lower increase inter body weight dialysis session .

Various method education has applied in increase understanding and compliance patient hemodialysis to procedure maintenance they . Methods the covers group training peer , gift education via booklet, usage application mobile health , as well as face-to-face programs face . In addition , special diet education For patient hemodialysis is also proven useful , as is the follow-up program carry on telephone and education to obedience to dietary measures and restrictions fluid . A number research , such as those conducted by (Irajpour et al. (2024), Dsouza et al. (2023), Torabikhah et al. (2023), and Fauzi & Oktaviani (2022)), have show positive results from application various educational programs the . Educational programs that focus on aspects certain like diet management , knowledge base about hemodialysis , or enhancement understanding to restrictions fluids and sodium, also provide meaningful contribution in increase quality maintenance for patient . With Thus , education is an integral part of maintenance patient hemodialysis and various approach that has been tested try own potency For increase results treatment as well as quality life patient .

In carrying out educational programs can use several educational models can increase desired result achieved . Peer education own potency big For increase level obedience patient hemodialysis to timetable sessions and rules restrictions fluid . This is effective and affordable method , which is very recommended For increase obedience in treatment patient with condition chronic (Irajpour et al., 2024) . Implementation guidelines developed nutrition own effect positive in increase knowledge patient hemodialysis and reducing enhancement weight between session (Shaker et al., 2017). Giving education and booklets can increase knowledge and obedience to patients hemodialysis , compliance increase in matter HD presence , duration , and shortening episodes , as well obedience fluids and diet (Dsouza. et al., 2023) .

Utilization technology and information in giving education has also been done done and caused good effect . Use application mobile health (Di Care) online significant reduce enhancement inter body weight session hemodialysis (IDWG) and improve levels of potassium, phosphorus , total cholesterol , triglycerides , and ferritin in blood (Torabikhah et al., 2023) . Education programs patient and follow up carry on call led by a nurse own impact significant to obedience treatment to patients hemodialysis (Arad et al., 2021) .

Implementation education with do training also becomes good way For reach desired result . Training provided to patient hemodialysis give contribution positive to obedience they to Diet and fluid restrictions , where Dietary compliance and restrictions fluid increased (Başer et al., 2019) . Training program management self interactive and oriented (HED-SMAR); HED-SMART, developed use principles solution problems and theories learning social , delivered in group format by professionals health for 4 sessions . HED-SMART provides an effective and practical model For increase health in patients hemodialysis . Observed improvements in marker clinical and compliance (Griva et al., 2018).

Educational programs provided to HD patients aim For increase knowledge patients (Dsouza. et al., (2023) , Fauzi & Oktaviani, (2022) , Parker, (2019) , Fadlalmola & Elkareem, (2020) , Shaker et al., (2017)), after patient own knowledge menai maintenance HD patients include in restrictions fluid so will increase behavior obedience restrictions fluid (Irajpour et al., (2024) , Dsouza. et al., (2023) . Arad et al., (2021) , (Fadlalmola & Elkareem, 2020), (Nadri et al., 2020), Başer et al., (2019) , (Parker, 2019), (Alikari et al., 2019), (Griva et al., 2018), (Sharaf, 2016)). If patient has obedient to restrictions fluid so will minimize complications that occur during dialysis one of them is IDWG (Torabikhah et al., (2023) Fauzi & Oktaviani, (2022) . Rosdiana et al., (2018), (Shaker et al., 2017), (Sharaf, 2016). Eventually patient will increase quality his life (Alikari et al., 2019).

CONCLUSION

Overview systematic This show that implementation of educational programs with various method very influence the treatment program HD patients like increase obedience treatment , compliance restrictions liquid , IDWG arrived with repair quality life patient . With providing educational programs can change behavior the patient in the end will minimize complications that occur in HD patients . The need for a good educational program strategy in change behavior This done with various method education applied in services for HD patients .

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