Study (year)	Country	Sample		Type of intervention		Intervention duration	Outcomes
		I	C	I	C		
Wei 2020	China	42	42	Comprehensive nursing care: Exercise training + health education	Usual care	--	①②
Zhou et al 2016	China	30	30	Comprehensive nursing care: Exercise training + health education + dietary intervention	Usual care	24 weeks	①②
Li et al2008	China	23	25	Comprehensive nursing care: dietary intervention + health education	Usual care	24 weeks	①②
Lu 2022	China	30	28	Comprehensive nursing care: Exercise training + health education + dietary intervention	Usual care	24 weeks	①②③
Abreu et al 2017	Brazil	25	19	Resistance exercise: Applying ankle-cuffs and elastic bands for training	Usual care	12 weeks	①②③
Wang et al 2019	China	20	20	Aerobic exercise: Cycling exercise program	Usual care	24 weeks	①②
Afshar et al 2010	Iran	7	7	Resistance exercise: Applying ankle weights for knee extension flexion and hip abduction-flexion for training	Usual care	8 weeks	①②
		7	7	Aerobic exercise: Cycling exercise program	Usual care	8 weeks	①②
Dai et al 2021	China	20	30	Resistance exercise	Usual care	24 weeks	①②③
Yan et al 2022	China	47	47	Resistance exercise: Applying exercise equipment for training, such as sandbags	Usual care	12 weeks	①②
Cai et al 2022	China	44	44	Resistance exercise: Applying sandbags, elastic bands, etc. for training	Usual care	24 weeks	①②③
Tayebi et al 2018	Iran	17	14	Resistance exercise: Included the isometric grip exercise and an isometric contraction of the leg and core	Usual care	8 weeks	②③

Liao et al 2016	China	20	20	Aerobic exercise: Cycling exercise program	Usual care	12 weeks	②③
Leng 2012	China	39	42	Aerobic exercise: Walking, brisk walking, jogging, tai chi, etc.	Usual care	24 weeks	①②③
Wang et al 2021	China	26	28	Aerobic exercise: Cycling exercise program	Usual care	24 weeks	①②
Wilund et al 2010	US	8	9	Aerobic exercise: Cycling exercise program	Usual care	16 weeks	②③
Su et al 2022	China	45	45	Aerobic exercise: Cycling exercise program, brisk walking	Usual care	--	①②
Wang et al 2023	China	43	41	ONS: A variety of substances such as protein, fat, carbohydrates, water, multivitamins, minerals and whey	Usual care	12 weeks	①②③
Chen et al 2019	China	54	54	ONS: Including protein, glutamine component, energy and iron, calcium elements	Usual care	24 weeks	①②③
Jeong et al 2019	US	45	44	ONS:30 grams of whey	Usual care	48 weeks	②③
		49	44	ONS combined with Aerobic exercise: oral protein supplement (30 grams of whey) ; Aerobic exercise: cycle ergometers	Usual care	48 weeks	②③
Limwannata et al 2021	Thailand	30	24	ONS: Including protein, Carbohydrate and Fat	Usual care	4 weeks	②③
Bolasco et al 2011	Italy	15	14	ONS: Oral amino acid supplementation	Usual care	12weeks	①②③
Tan et al 2015	China	31	31	ONS: Including energy, protein, fat and carbohydrate	Usual care	12 weeks	①②③

Yang et al 2021	China	120	120	ONS: Including energy, fat and unsaturated fatty acids et al	Usual care	12 weeks	①②③
Wen et al 2022	China	49	43	ONS: Oral nonprotein calorie jelly: including energy, fat and carbohydrate	Usual care	24 weeks	①②③
Sezer et al 2014	Turkey	29	29	ONS: including protein, energy, fat, carbohydrate , sodium, potassium and phosphorus	Usual care	24 weeks	①②③
Yu et al 2018	China	31	31	ONS: Doesn't state nutritional content	Usual care	12 weeks	②③
Ai 2020	China	40	40	Dietary intervention: Develop an individual programme to provide 1.2-1.4 g/kg of high-quality protein (eggs, milk, lean meat) and low-fat diet; adjust sugar, potassium and sodium intake with nutritional indicators; supplement with micronutrients; and provide guidance on dietary measurements and record-keeping	Usual care	12 weeks	① ②③
(Sun, Sun & Yang (2022a)	China	60	59	Dietary intervention: According to the 2021 edition of the Chinese Nutrition Guidelines for Chronic Kidney Disease [1], the diet plan was formulated: 1) accurate measurement, distribution of scale instruments and quantitative control table; 2) accurately record food types and portions using diary cards; 3) accurate assessment and adjustment of diet plan according to biochemical test results; 4) Accurate correction of deviations to correct dietary misunderstandings and defects of patients	Usual care	24 weeks	①②
Zhou 2020	China	37	37	Dietary intervention: Individualized dietary regimen according to the patient's condition. High-quality protein (milk, chicken, lean meat, etc.), alpha keto acid tablets if necessary, low-fat diet (1.5 g/(kg/d), sugar 5 g/(kg/d), vitamin and trace element supplementation, and enhanced education	Usual care	--	①②

Xu et al 2022	China	25	25	Dietary intervention: After the evaluation of patients, a personalized diet plan was formulated, containing high-quality protein (eggs, fish, lean meat, etc.) accounting for more than 50% of the intake of food, sugar 5-6g/kg, sodium 6g/d, plant fat, vitamins and trace elements, and strengthening health education	Usual care	--	①②
Wang 2019	China	37	37	Dietary intervention: Nutritionist customized program, fat 1.5g/kg, sugar 5g/kg, high-quality protein (eggs, milk, meat), α-keto acid tablets, vitamin and trace elements supplement, strengthen health education	Usual care	24 weeks	①②③
Wang 2018	China	30	30	Dietary intervention: Nutritionist customized personalized diet plan. Fat 1.5g/kg, sugar 5g/kg, high quality protein (eggs, milk, lean meat) 1.2gkg, can add α-keto acid, vitamin and trace elements, strengthen health education.	Usual care	--	①②③
Deng 2011	China	48	48	Dietary intervention: The patients' nutritional status and dietary habits were evaluated to develop individualized diet plans. Contain high quality protein (eggs, fish, lean meat, etc.), calories, fat and other nutrients supplement; Water and electrolyte regulation included potassium, sodium salt, phosphorus (0.6-1.2g/d); Vitamins and trace elements were supplemented, and health education was strengthened	Usual care	96 weeks	①②
Li et al 2020	China	20	20	Dietary intervention: According to the patient's condition, the diet plan was customized: 200-250g grain per day, fat accounting for 20%-30% of total energy, glucose <50g (⩽10% of total energy), protein 1.5g/kg (preferably chicken, fish and beef), and calorie 146kcal/kg. Instruction in proper cooking techniques, such as potassium removal of vegetables, and adjustment of diet based on biochemical examinations	Usual care	--	②③
Xu et al 2016	China	46	46	Dietary intervention: According to the patient's condition, the Nutritionist made a personalized diet plan: fat 15 g/kg, sugar 5g/kg, supplemented lean	Usual care	24 weeks	①②③

				meat, milk, eggs and other high-quality protein, oral α-keto acid tablets, vitamin and trace elements, and strengthened health education			
Kozlowska et al 2023	Poland	35	35	Dietary intervention: Individualized diet plans according to European guidelines [2], meals provided by diet catering companies with nutritional values of about 20%± of the average requirement.: energy 416 ± 23 kcal, protein 16.4 ± 0.6 g, fat 14.2 ± 1.6 g, total carbohydrates 58.2 ± 5.6, potassium 452.7 ± 79.6 mg, and phosphorus 183.9 ± 10.5 mg	Usual care	24 weeks	①②③
Feng et al 2020	China	68	68	Health education: Electronic Intelligent Tool + Nutritional Guidance: (1) build a WeChat group to guide patients and their families to use the personalized dietary application for kidney disease; (2) enter patient information into the WeChat public number applet to automatically generate a daily diet plan; (3) the applet recommends recipes, provides illustrations of the amount of food, and the patient chooses his/her own food; and (4) the patient eats according to the recommendation and provides feedback on the use of the applet on a monthly basis	Usual care	48 weeks	①②
Zeng et al 2020	China	50	50	Health education:(1) Establish wechat group and QQ group, including supervisor nurses, dietitians, specialists and patients; (2) nurse-in-charge provided psychological guidance, enhanced diet implementation, and encouraged sports and sports activities; (3) Network assistance of dietitian for results feedback, answers to nutrition knowledge, recipe adjustment, and personalized guidance; (4) The whole process is supervised by specialists	Usual care	24 weeks	①②

Shi et al 2021	China	79	78	Health education: Hemodialysis specialist nurses, nephrologists, nutrition managers and medical information technicians. The head nurse was responsible for the overall arrangement, organization of training and content writing, and the team solved the problems in the intervention together. (2) Nutrition education module: Information technology engineers set up a "nutrition learning garden for hemodialysis patients" on the hospital platform, which was exclusive to the experimental group. Researchers designed individualized nutrition programs and pushed them through columns. Patients can log in with ID and leave messages for interaction. Researchers replied in time, and designed the next push content according to the feedback. Content is not repeated, and past content remains searchable. The team designed the push content according to the evaluation results and literature	Usual care	12 weeks	①②
Vijaya et al 2019	India	139	138	Health education: Dietary patterns are developed by a renal dietitian on a monthly basis based on the patient's condition. Dietary guidance is also provided to dialysis patients in the form of one-on-one counselling or group counselling, and hands-on nutritional education sessions are provided to family members and friends of the patients	Usual care	24 weeks	③

Yao et al 2020	China	48	46	Health education:(1) Establish a diet education group: learn the Diet Education Manual for maintenance hemodialysis Patients, diet management, wechat and peer support, forgetting curve and other knowledge. (2) Evaluation: patients' diet management behavior was evaluated and graded into excellent, good and poor levels, individualized education programs were formulated, and patients were taught to use Internet and wechat to receive education. (3) Diet education: hierarchy: nurses were assigned according to the score of diet management behavior; Stage type: according to the forgetting curve, they were divided into early stage, middle stage and late stage, and different intensities of education were given. Diversification: distribution of health education manuals, combined with individual health education, according to the score of diet management behavior was divided into three grades: excellent, medium and poor. A 3-day food diary card was used to record food intake. Wechat group, video lectures, peer support, etc. were selected according to the patient's condition. (4) Follow-up management: outpatient, wechat, telephone and home visits, and follow-up frequency was adjusted according to the situation	Usual care	24 weeks	①②
Fakhrpour et al 2020	Iran	24	21	Aerobic and Resistance exercise: Cycling exercise program + Resistance exercise of the lower	Usual care	16 weeks	①
Tabibi et al 2023	Iran	35	33	Aerobic and Resistance exercise: Aerobic exercise included moving legs back and forth, shoulder abduction and adduction et al; Resistance exercise included exercises for the upper and lower limbs as well as core strength exercises using body weight, weight cuffs, dumbbells, and elastic bands of varying intensity	Usual care	24 weeks	①②
Fang et al 2023	China	29	30	Aerobic and Resistance exercise: Cycling exercise + Resistance exercise for the upper and lower limbs	Usual care	12 weeks	①

Frih et al 2017	Tunisia	21	20	Aerobic and Resistance exercise: Aerobic exercise included endurance program included ergometer cycling and treadmill walking; Resistance exercise included dynamic closed and open-chain strengthening exercises. Such as the quadriceps muscles, pectoral muscles, triceps brachia muscles, biceps brachia muscles, and hamstrings were trained on a multigym	Usual care	16 weeks	①②
Zhu et al 2020	China	53	53	Aerobic and Resistance exercise: Aerobic exercise included cycling exercise, jogging ea al; Resistance exercise inculded sandbags, stretch cords, et al	Usual care	12 weeks	①②
Martin-Alemañy et al 2020	Mexico	12	13	ONS combined with Aerobic exercise: ONS included energy, Protein, Carbohydrate and Fat et al; Aerobic exercise: Pedaling astationary bike	ONS	12 weeks	① ②③
		9	13	Carbohydrate and Fat et al; Resistance exercise: Patients were trained according to an adaptation of the program “Exercise: A Guide for People on Dialysis” [3]	ONS	12 weeks	① ②③
Martin-Alemañy et al 2016	Mexico	17	19	ONS combined with Resistance exercise: ONS included energy, Protein, Fat and vitamins et al; Resistance exercise: Patients were trained according to an adaptation of the program “Exercise: A Guide for People on Dialysis” [3]	ONS	12 weeks	②
Hristea et al 2016	France	7	9	ONS combined with Aerobic exercise: ONS: adjusted to EBP guideline settings and patient needs [4]; Aerobic exercise: submaximal individualized cycling exercise using a cycloergometer[4]	ONS	24 weeks	①②③

Martin-Alemañy et al 2022	Mexico	10	14	ONS combined with Aerobic and Resistance exercise: ONS included energy, Protein, Carbohydrate and Fat et al; Aerobic exercise: Cycling exercise program; Resistance exercise: Patients were trained according to an adaptation of the program "Exercise: A Guide for People on Dialysis" [3]	ONS	24 weeks	②
Dong et al 2011	US	10	12	ONS combined with Resistance exercise: ONS included energy, Protein, Carbohydrate and Fat et al; Resistance exercise: A pneumatic leg press machine	ONS	24 weeks	①③

[1] CHINESE SOCIETY OF NEPHROLOGISTS C M D A, EXPERT COLLABORATION GROUP OF NUTRITIONAL THERAPY GUIDELINES OF KIDNEY DISEASE COMMITTEE OF CHINESE SOCIETY OF INTEGRATED TRADITIONAL CHINESE AND WESTERN MEDICINE. Clinical practice guideline for nutritional therapy of chronic kidney disease in China (2021 edition) [J]. National Medical Journal of China, 2021, 101(8): 539-59.

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