

Supplementary material

Table S1: Meta-ethnography reporting guidelines (eMERGE)(1)

No.	Criteria headings	Reporting criteria	Page no.
Phase 1 – selecting meta-ethnography and getting started			
Introduction			
1	Rationale and context for meta-ethnography	Describe the gap in research or knowledge to be filled by the meta-ethnography, and the wider context of the meta-ethnography	3-4
2	Aim(s) of meta-ethnography	Describe the meta-ethnography aim(s)	4
3	Focus of meta-ethnography	Describe the meta-ethnography review question(s) (or objectives)	4
4	Rationale for using meta-ethnography	Explain why meta-ethnography was considered the most appropriate qualitative synthesis methodology	4
Phase 2 – Deciding what is relevant			
Methods			
5	Search strategy	Describe the rationale for the literature search strategy	4
6	Search processes	Describe how literature search was carried out and by whom	4-5
7	Selecting primary studies	Describe the process of study screening and selection, and who was involved	4-5
Findings			
8	Outcome of study selection	Describe the results of study searches and screening	6
Phase 3 – Reading included studies			
Methods			
9	Reading and data extraction approach	Describe the reading and data extraction method and processes	5
Findings			
10	Presenting characteristics of included studies	Describe characteristics of the included studies	6
Phase 4 – Determining how studies are related			
Methods			
11	Process for determining how studies are related	Describe the methods and processes for determining how the included studies are related: <ul style="list-style-type: none"><li>Which aspects of studies were compared?</li><li>How the studies were compared?</li></ul>	5
Findings			
12	Outcomes of relating studies	Describe how studies relate to each other	8, 11-12
Phase 5 – Translating studies into one another			

Methods			
13	Process of translating studies	Describe the methods of translation: <ul style="list-style-type: none"><li>Describe steps taken to preserve the context and meaning of the relationships between concepts within and across studies</li><li>Describe how the reciprocal and refutational translations were conducted</li><li>Describe how potential alternative interpretations or explanations were considered in translation</li></ul>	5-6
Findings			
14	Outcome of translation	Describe the interpretive findings of the translation	8-12
Phase 6 – Synthesising translations			
Methods			
15	Synthesis process	Describe the methods used to develop overarching concepts (“synthesised translations”) Describe how potential alternative interpretations or explanations were considered in the synthesis	5-6
Findings			
16	Outcome of synthesis process	Describe the new theory, conceptual framework, model, configuration, or interpretation of data developed from the synthesis	11-12
Phase 7 – Express the synthesis			
Discussion			
17	Summary of findings	Summarise the main interpretive findings of the translation and synthesis and compare them to existing literature	12-16
18	Strength, limitation, and reflexivity	Reflect on and describe the strengths and limitations of the synthesis: <ul style="list-style-type: none"><li>Methodological aspects - for example, describe how the synthesis findings were influenced by the nature of the included studies and how the meta-ethnography was conducted.</li><li>Reflexivity - for example, the impact of the research team on the synthesis findings</li></ul>	16-17
19	Recommendations and conclusions	Describe the implication of the synthesis	17

**Table S2. Enhancing Transparency in Reporting the Synthesis of Qualitative Research (ENTREQ) statement(2).**

No	Item	Guide and description	Page no.
1	Aim	State the research question the synthesis addresses.	3-4
2	Synthesis methodology	Identify the synthesis methodology or theoretical framework which underpins the synthesis, and describe the rationale for choice of methodology (e.g. meta-ethnography, thematic synthesis, critical interpretive synthesis, grounded theory synthesis, realist synthesis, meta-aggregation, meta-study, framework synthesis).	4-5
3	Approach to searching	Indicate whether the search was pre-planned (comprehensive search strategies to seek all available studies) or iterative (to seek all available concepts until they theoretical saturation is achieved).	4-5
4	Inclusion criteria	Specify the inclusion/exclusion criteria (e.g. in terms of population, language, year limits, type of publication, study type).	4
5	Data sources	Describe the information sources used (e.g. electronic databases (MEDLINE, EMBASE, CINAHL, psycINFO, Econlit), grey literature databases (digital thesis, policy reports), relevant organisational websites, experts, information specialists, generic web searches (Google Scholar) hand searching, reference lists) and when the searches conducted; provide the rationale for using the data sources.	4-5
6	Electronic Search strategy	Describe the literature search (e.g. provide electronic search strategies with population terms, clinical or health topic terms, experiential or social phenomena related terms, filters for qualitative research, and search limits).	4-5
7	Study screening methods	Describe the process of study screening and sifting (e.g. title, abstract and full text review, number of independent reviewers who screened studies).	4-5
8	Study characteristics	Present the characteristics of the included studies (e.g. year of publication, country, population, number of participants, data collection, methodology, analysis, research questions).	6-7
9	Study selection results	Identify the number of studies screened and provide reasons for study exclusion (e.g. for comprehensive searching, provide numbers of studies screened and reasons for exclusion indicated in a figure/flowchart; for iterative searching describe reasons for study exclusion and inclusion based on modifications t the research question and/or contribution to theory development).	Figure 1
10	Rationale for appraisal	Describe the rationale and approach used to appraise the included studies or selected findings (e.g. assessment of conduct (validity and robustness), assessment of reporting (transparency), assessment of content and utility of the findings).	5
11	Appraisal items	State the tools, frameworks and criteria used to appraise the studies or selected findings (e.g. Existing tools: CASP, QARI, COREQ, Mays and Pope(3); reviewer developed tools; describe the domains assessed: research team, study design, data analysis and interpretations, reporting).	5
12	Appraisal process	Indicate whether the appraisal was conducted independently by more than one reviewer and if consensus was required.	5
13	Appraisal results	Present results of the quality assessment and indicate which articles, if any, were weighted/excluded based on the assessment and give the rationale.	5, 8

14	Data extraction	Indicate which sections of the primary studies were analysed and how were the data extracted from the primary studies? (e.g. all text under the headings “results /conclusions” were extracted electronically and entered into a computer software).	5
15	Software	State the computer software used, if any.	5
16	Number of reviewers	Identify who was involved in coding and analysis.	5-6
17	Coding	Describe the process for coding of data (e.g. line by line coding to search for concepts).	5-6
18	Study comparison	Describe how were comparisons made within and across studies (e.g. subsequent studies were coded into pre-existing concepts, and new concepts were created when deemed necessary).	5-6
19	Derivation of themes	Explain whether the process of deriving the themes or constructs was inductive or deductive.	5-6
20	Quotations	Provide quotations from the primary studies to illustrate themes/constructs and identify whether the quotations were participant quotations of the author’s interpretation.	9-11
21	Synthesis output	Present rich, compelling and useful results that go beyond a summary of the primary studies (e.g. new interpretation, models of evidence, conceptual models, analytical framework, development of a new theory or construct).	9-12

Table S3. Preferred Reporting Items for Systematic reviews and Meta-Analyses

Section	Item #	Checklist item	Location
TITLE			
Title	1	Identify the report as a systematic review.	Title page
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Abstract, pages 1-2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Introduction, page 3-4
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Introduction, page 4
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Selection criteria, page 4
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Data sources and searches, page 4-5
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Supplementary table 4
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Data sources and searches, page 4-5
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Data extraction, page 5
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Did not apply
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Did not apply

Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Did not apply
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Did not apply
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Data sources and searches, page 4-5
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Data synthesis, page 5
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Data synthesis, page 5-6
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Data synthesis, page 5-6
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Did not apply
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Did not apply
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Quality appraisal, page 5
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Did not apply
<b>RESULTS</b>			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Figure 1
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Did not apply
Study characteristics	17	Cite each included study and present its characteristics.	Study characteristics, pages 6-7

Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Supplementary tables 6-8
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Did not apply
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Did not apply
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Qualitative data synthesis, page 8-11
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Did not apply
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Did not apply
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Did not apply
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Did not apply
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Discussion, page 12-16
	23b	Discuss any limitations of the evidence included in the review.	Strength and limitation, page 16
	23c	Discuss any limitations of the review processes used.	Strength and limitation of the method, page 2
	23d	Discuss implications of the results for practice, policy, and future research.	Future research, page 17
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Page 4

	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Did not apply
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Did not apply
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Funding statement, page 18
Competing interests	26	Declare any competing interests of review authors.	Competing interest, page 2
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Availability of data, page 18

Section and Topic	Item #	Checklist item	Reported (Y/N)
TITLE			
Title	1	Identify the report as a systematic review.	Y
BACKGROUND			
Objectives	2	Provide an explicit statement of the main objective(s) or question(s) the review addresses.	Y
METHODS			
Eligibility criteria	3	Specify the inclusion and exclusion criteria for the review.	Y
Information sources	4	Specify the information sources (e.g. databases, registers) used to identify studies and the date when each was last searched.	Y
Risk of bias	5	Specify the methods used to assess risk of bias in the included studies.	Y
Synthesis of results	6	Specify the methods used to present and synthesise results.	Y
RESULTS			
Included studies	7	Give the total number of included studies and participants and summarise relevant characteristics of studies.	Y
Synthesis of results	8	Present results for main outcomes, preferably indicating the number of included studies and participants for each. If meta-analysis was done, report the summary estimate and confidence/credible interval. If comparing groups, indicate the direction of the effect (i.e. which group is favoured).	Y



DISCUSSION			
Limitations of evidence	9	Provide a brief summary of the limitations of the evidence included in the review (e.g. study risk of bias, inconsistency and imprecision).	Y
Interpretation	10	Provide a general interpretation of the results and important implications.	Y
OTHER			
Funding	11	Specify the primary source of funding for the review.	N/A
Registration	12	Provide the register name and registration number.	Y

Table S4. Search strategy

CENTRAL	Scopus	EBSCOHost (including MEDLINE, CINAHL & SPORTDiscus)
1. MeSH descriptor: [Renal Insufficiency, Chronic]	1. All fields: chronic AND kidney AND disease OR	1. TX (chronic renal failure or ckd or esrd or renal insufficiency or kidney failure or chronic kidney failure or kidney disease or renal disease or renal failure or kidney failure or renal insufficiency, chronic or chronic kidney diseases of uncertain etiology or kidney failure, chronic or cardiorenal syndrome)
2. MeSH descriptor: [Kidney Failure, Chronic]	2. All fields: dialysis OR	2. TX (dialysis or hemodialysis or haemodialysis or peritoneal dialysis or renal replacement therapy)
3. MeSH descriptor: [Cardio-Renal Syndrome]	3. All fields: kidney AND transplant OR kidney AND transplantation AND	3. TX (kidney transplantation or kidney transplant or renal transplant or renal transplantation)
4. ("chronic renal failure" or "ckd" or "esrd" or "renal insufficiency" or "kidney failure" or "chronic kidney failure") OR ("kidney disease" or "renal disease" or "renal failure" or "kidney failure" or "kidney transplant") OR ("dialysis" or "hemodialysis" or "haemodialysis" or "peritoneal dialysis" or "renal replacement therapy") OR ("kidney transplantation" or "kidney transplant" or "renal transplant" or "renal transplantation")	4. All fields: digital AND technology  OR	4. TX (lifestyle changes or lifestyle modification or lifestyle choices or lifestyle change or intervention)
5. #1 OR #2 OR #3 OR #4	5. ehealth OR	5. TX (healthy lifestyle or healthy life habit or exercise or diet, healthy)
6. MeSH descriptor: [Telemedicine]	6. smartphone AND apps AND	6. TX (lifestyle education or lifestyle teaching or health promotion advice)
7. MeSH descriptor: [Telerehabilitation]	7. exercise OR	7. TX (ehealth or e-health or telecare or telemedicine or telehealth or digitalhealth or mhealth or telehealth)
8. MeSH descriptor: [Remote Consultation]	8. diet AND	8. TX (mhealth or mobile health or m-health or mobile app or mobile application or smartphone application or app or apps)
9. ("ehealth" or "e-health" or "telecare" or "telemedicine" or "telehealth" or "digital health" or "mhealth" or "telehealth") OR ("mhealth" or "mobile health" or "m-health" or	9. qualitative AND research OR	9. TX (telerehabilitation or tele-rehabilitation or internet-based or web-based or ehealth)

"mobile app" or "mobile application" or "smartphone application" or "app" or "apps") OR ("digital technology" or "web technology" or "software technology" or "virtual technology") OR ("telerehabilitation" or "tele-rehabilitation" or "virtual rehabilitation" or "remote rehabilitation" or "internet-based" or "web-based" or "chealth")		
10. #6 OR #7 OR #8 OR #9	10. interview OR	10. TX (qualitative research or qualitative study or qualitative methods or interview or focus group)
11. MeSH descriptor: [Healthy Lifestyle]	11. mixed-method	11. TX (mixed methods or mixed method or mixed-method)
12. MeSH descriptor: [Exercise]		12. 1 AND 2 AND 3 AND 4 AND 5 OR 6 AND 7 AND 8 AND 9 AND 10 AND 11
13. MeSH descriptor: [Diet, Healthy]		
14. ("lifestyle changes" or "lifestyle modification" or "lifestyle choices" or "lifestyle change" or "intervention") OR ("healthy lifestyle" or "healthy life habit" or "exercise" or "good diet") OR ("lifestyle education" or "disease education" or "lifestyle teaching" or "health promotion advice")		
15. #11 OR #12 OR #13 OR #14		
16. MeSH descriptor: [Qualitative Research]		
17. MeSH descriptor: [Grounded Theory]		
18. ("qualitative research" or "qualitative study" or "qualitative methods" or "interview" or "focus group") OR ("ethnographic research" or "ethnography" or "ethnographic" or "phenomenological") OR ("mixed methods" or "mixed method" or "mixed-method")		
19. #16 OR #17 OR #18		
20. #5 AND #10 AND #15 AND #19		

Table S5. Technology Functionality Framework(4)

Functionality category	Definition
Inform	Provide information using various formats (e.g., textual, audiovisual)
Instruct	Provide instructions to health consumers
Record	Collect data inputted by health consumers
Display	Display users' data as graphs
Guide	Provide guidelines to inform course of action based on users' data (e.g., recommend physician consult, course of treatment)
Remind/Alert	Provide reminders
Communicate	Enable provider-consumer communication or provide links to virtual support groups

Study	Duration (weeks)	Description of consumer health informatics	Digital technology function	Participants' preferences
Computerised system (website)				
Castle, 2021(5)	Did not apply	This was a qualitative study that recruited people who received a kidney transplant within <3 months to test the prototype of a website called ExeRTiOn in a supervised one-off research visit. ExeRTiOn has a patient-facing platform and a clinician-facing back-end platform. The clinician-facing back-end platform allows study coordinators to monitor participants' activities, adherence, weekly physical activity and weight. Clinicians also answered questions through a secured built-in messaging system. The website distributes weekly educational sessions on healthy behaviours including goal-setting, meal planning and managing physical activity after transplant.	Inform, Instruct, Record, Display, Guide, Remind, Communicate	<ul style="list-style-type: none"><li>- Personalised goal-settings</li><li>- Self-monitoring of weight and physical activity,</li><li>- Provision of lifestyle guidance</li><li>- Combined patient-expert and clinicians' input</li><li>- Weekly automated emails or messages</li><li>- Communication between participants and care providers</li><li>- Clear navigational features (e.g., more navigation buttons).</li></ul>
Castle, 2022(6)	12	This was a mixed-methods randomised controlled trial that explored the feasibility, acceptability and user-experience of a refined prototype of a website called ExeRTiOn. ExeRTiOn a password protected website that contained both a patient-facing and back-end clinician-facing platform. The website has a secure encrypted two-way message function to support communication between participants and clinicians. Participants attended an in-person orientation session then completed 12-weekly educational sessions independently. The website included kidney transplant specific education from physicians, tips from patient-experts, a home exercise diary, a resource page, graphs of self-reported physical activity minutes and body weight. Clinicians encouraged physical activity and healthy eating goals. Participants were prompted to self-monitor physical activity levels and body weight	Inform, Instruct, Record, Display, Guide, Remind, Communicate	<ul style="list-style-type: none"><li>- Information on managing cravings following transplantation</li><li>- Self-monitoring of physical activity and body weight</li><li>- Supervision and support from a qualified clinician to facilitate gradual increase in physical activity following transplantation.</li></ul>

		weekly. Personalised reminders were generated when two consecutive sessions were not completed. After completing 12 weeks of education, participants were able to revisit the website as they see fit for another 12 months.		
Donald, 2022(7)	8	This was an explanatory sequential mixed-methods study of people with chronic kidney disease 3-4 that sought to evaluate participants' acceptability, perceived self-efficacy and potential factors related to the implementation and utility of a website called My Kidney My Health. The My Kidney My Health website is a patient-facing, open-access, interactive website that provides education using various audiovisual formats (e.g., videos, reading materials). The website included tailored tools to encourage behaviour change and promote provider-consumer communication, including My Food List, Depression Screener, My Question List.	Inform, Record, Communicate	<ul style="list-style-type: none"> <li>- Information regarding travel, mental and sexual health and peer support.</li> <li>- Modes of delivering education such as webinars and content specific for families and caregivers.</li> </ul>
<b>Multicomponent</b>				
Chang, 2020(8)	8	This was a pre-post, mixed methods feasibility study of 16 people with chronic kidney disease 1-3a that sought to evaluate the feasibility and acceptability of a dietary counselling program that included weekly telephone calls and daily dietary entry using smartphone applications. There were two smartphone apps in this study. For the first 7 patients, the authors used a customised app that included daily sodium tracker, daily survey to quantify fruits and vegetable intake, daily healthy lifestyle reminders, weekly goal targets for sodium and fruit/vegetable consumption, and a provider-consumer for communication and sharing of dietary data. However, the first app received negative patient feedback regarding its functionality. As a result, the authors switched to a commercially available app for the other 9 patients. The commercially available app also allowed consumers to track and share dietary data. Participants also received phone call reminders from investigators once every week.	Inform, Record, Guide, Remind, Communicate	<ul style="list-style-type: none"> <li>- Apps were beneficial to track and receive feedback on sodium and energy intake however usability was limited by functional challenges such as crashes and navigational difficulties</li> <li>- Remote counselling using telephone was beneficial but convenience in scheduling was important when utilising this approach.</li> </ul>
Shen, 2022(9)	Did not apply	This was a basic interpretive, cross-section qualitative study with semi-structured interviews that sought to examine the perceptions, attitudes and needs of people with chronic kidney disease 1-5 regarding electronic self-management interventions in general and a website-based digital intervention in specific. Participants were asked about their perception regarding general electronic health self-management interventions that help them to maintain a healthy lifestyle, meet their life-participation needs, care for their chronic condition and prevent further exacerbation. These electronic health	<u>General electronic health self-management interventions:</u> unclear function.  <u>Website:</u> Inform, Record, Display, Communicate	For general electronic health technology: <ul style="list-style-type: none"> <li>- Provides access to relevant and conducive health information</li> <li>- Support communication with care providers outside clinical visits</li> <li>- Facilitate self-monitoring of physiological parameters.</li> </ul>

		self-management interventions were defined as any information and communication technology to deliver health services and information. Next, participants were asked about their perception towards a website called Dutch Medical Dashboard that included self-measurements, visualised hospital data, and education on laboratory tests and healthy lifestyle. The Dutch Medical Dashboard support remote monitoring and tracking of health-related behaviours and disease parameters.		<p>- Participants preferred mobile health apps over websites for self-management as apps were considered more accessible.</p> <p>For website Dutch Medical Dashboard:</p> <ul style="list-style-type: none"> <li>- Provide access to credible CKD-related information</li> <li>- Inform laboratory tests results prior to clinical visits</li> <li>- Options to communicate with care providers.</li> </ul>
Weber, 2021(10)	Did not apply	This was a qualitative study with formative, in-depth interviews that sought to explore the perception of people with chronic kidney disease stages 3-5 regarding various technologies that promote physical activity, including wearable activity trackers, mobile phone health applications, and computerised systems.	The study did not specify the function of digital technology	Participants were eager and willing to try technological solutions to promote physical activity. Participants identified barriers that needed to be addressed including lack of tailored applications, limited technological literacy, potential costs, dissatisfaction with poor design and lack of motivation to use technology long-term.
<b>Telehealth</b>				
Gibson, 2020(11)	24	This was a mixed methods randomised controlled trial that sought to assess the feasibility and acceptability of videoconferencing technology to deliver nutrition and physical activity intervention among kidney transplant recipients. Participants in the intervention group completed weekly 1-hour educational sessions via videoconferencing for 12 weeks. These sessions contained information on nutrition, PA, and behavioural change strategies tailored to kidney transplant recipients. Remotely delivered coaching sessions comprised interactive discussion and group physical activity. Interactive discussions provide opportunities for participants to learn about portion sizes and healthy cooking skills as well as share sample menus. Participants also completed three, 10-15 minutes bouts of moderate intensity physical activity (i.e., 3-6 METs) daily in home settings. Participants were instructed to accumulate at least 150 minutes of moderate intensity physical activity per week, as tolerance allowed.	Inform, Instruct, Record, Communicate	<ul style="list-style-type: none"> <li>- Monitoring dietary consumption was difficult but assisted in developing a greater awareness of dietary habits</li> <li>- Preferences: additional sessions to instruct exercise, timing the intervention to avoid the holiday season, and extending the duration of the intervention beyond 3 months.</li> </ul>
Kelly, 2019(12) and Warner, 2019(13)*	24	This was a mixed-methods process evaluation that was embedded in a randomised controlled trial that sought to evaluate the feasibility and acceptability of a telehealth intervention to support dietary self-management in people with chronic kidney disease 3-4. Participants in the intervention group received six telephone calls (one fortnightly) and personalised text messages (1-4 weekly as determined by personal preferences). Each telephone call contains information on goal setting; the Australian Dietary and physical	Inform, Record, Communicate	<ul style="list-style-type: none"> <li>- Regular communication and encouragement</li> <li>- Personalised approach to dietary counselling</li> <li>- Access to appropriately qualified health professionals</li> <li>- Flexible scheduling</li> <li>- Ability to participate in the comfort of own home</li> <li>- Understandable health education, practical problem solving and realistic goal setting.</li> </ul>

		activity guidelines; diet in kidney disease; self-monitoring checklists; and a reference section with recommendations for others. During these calls, dietitians assisted participants to develop feasible and achievable goals. In addition to phone calls, participants also received personalised text messages which educate them on self-monitoring guidance, goal checks, and educational tips. Finally, they also receive telehealth support by dietitians who were trained in motivational interviewing.		
<b>Mobile health (application software)</b>				
Khoury, 2019(14)	Did not apply	This was a qualitative study with semi-structured interview that sought to explore the perception of people with chronic kidney disease 3-4 regarding a smartphone app called the KELA.AE app. The KELA.AE app provided educational regarding the diagnosis, evaluation, prevention, and treatment of chronic kidney disease – bone mineral disease. This information was delivered in accordance with clinical practice guidelines from the Kidney Disease Improving Global Outcomes. The app delivered education in various ways including podcasts, videos and notifications. The app also provided Emirati food recipes that were adapted to the renal diet (i.e., containing less phosphorous, sodium, and potassium). The app included self-monitoring features, including a food intake diary and laboratory value tracker.	Inform, Instruct, Record, Display.	<ul style="list-style-type: none"> <li>- Preference for digital modes of delivering information including app-based podcasts and videos over traditional paper-based education.</li> <li>- Communication options with a dietitian</li> <li>- Search feature to ascertain the nutritional content of traditional Saudi Arabian cuisine.</li> </ul>
O'Brien, 2020(15)	Did not apply	This was a qualitative study with content analysis design that aimed to explore the perceptions of kidney transplant recipients who use mobile health applications for self-management. Participants identified important function including health tracking, feedback and usability.	The study did not use a specific app.	<ul style="list-style-type: none"> <li>- Tracking of medication (dose and schedule) and health (nutrition, fluid, laboratory values and physical activity),</li> <li>- Personalised feedback (short messaging services, awards, colour coded bar graphs to indicate abnormal health values)</li> <li>- Optimal factors of usability (large font, easily understandable and navigable information).</li> </ul>
<b>Mobile health (short messaging services)</b>				
Dawson, 2021(16) and Dawson, 2021(17)*	24	This pair of papers included a randomised feasibility study and a supplementary qualitative study with semi-structured interview that aimed to evaluate the feasibility of unidirectional mobile phone short messaging services to improve dietary self-management in people who received haemodialysis. Participants in the intervention group received usual care and 3 text messages per week over 24 weeks. Text messages required no response from participants and can include content such as advice, information, and motivation and support to improve healthy renal dietary patterns (restriction	Inform, Remind, Guide	<ul style="list-style-type: none"> <li>- Informative and simple education that was CKD-specific</li> <li>- Regular dietary reminders</li> <li>- Personalised information to promote behaviour change.</li> </ul>

		for potassium, phosphorus, sodium, and fluid), general healthy eating and lifestyle behaviors.		
Unclear mobile health				
Sieverdes, 2015 (18)	Did not apply	This was a qualitative study with in-depth key informant interviews that aimed to explore barriers and perceptions of physical activity and the use of mobile health technology to promote physical activity for people on the kidney transplant wait list.	The study did not specify which type of mobile health technology was used.	- mobile health technology that can support self-monitoring of physical activity. Participants believed that monitoring physical activity would provide information and improve their confidence to increase physical activity.
Unclear technology				
Mathur, 2021(19)	Did not apply	This was a qualitative study with semi-structured interviews that aimed to explore the role of digital health tools in promote physical activity for people with solid organ transplant. However, the exact type of digital health tool was not specified.	The study did not specify the type of technology used.	- An integrated system that can support physical activity, diet, fluid and medication - Provide information about the type and timing of exercise - Support self-monitoring and sharing of data with specific care provider - Facilitate social support between others with similar care experiences

\*Supplementary publications with the same participants.



Table S6. Demographics information on consumers

Papers	Settings	Sample (n)	Female, n (%)	Age*	White#	African#	Asian#	Indigenous #	Pacific Islander#	Hispanics#	Mixed heritage#	Other#
Castle, 2021(5)	KTR<3 months	11	6 (55)	50 (14)	6 (54)	3 (28)	1 (9)					1 (9)
Castle, 2022(6)	KTR <3 months	13	6 (46)	44.5 (7.51)	5 (39)	6 (46)	2 (15)					
Donald, 2022(7)	CKD 1-5	15	7 (47)	Range: n (%): - 25-49: 4 (27) - 50-64: 5 (33) - 65-74: 1 (7) - 75+: 5 (33)	13 (87)							2 (13)
Dawson, 2021 (16) & Dawson, 2021(17) *	HD	25	9 (36)	60.2 (13.6)	11 (44)		5 (20)	1 (4)	5 (20)			3 (12)
Sieverdes, 2015(18)	Dialysis	22	10 (45)	46 (11)		18 (82)						4 (18)
Gibson, 2020(11)	KTR 6-12 months	10	5 (50)	44.6 (10)	5 (50)	2 (20)				1 (10)	2 (20)	
Kelly, 2019(12) & Warner, 2019(13)*	CKD 3-4	21	7 (33)	62	17 (81)			1 (5)				3 (14)
Khoury, 2019(14)	HD	6	2 (33)	47 (15)			6 (100)					
O'Brien, 2020(15)	KTR >3 months	20	11 (55)	54 (14.8)	16 (80)	2 (10)						2 (10)
Mathur, 2021(19)	KTR > 1 year	7	NR	NR								
Chang, 2020(8)	CKD 1-3a	8	NR	NR	8 (100)							
Shen, 2022(9)	CKD 1-5	20	11 (55)	41.1 (11.4)			20 (100)					
Weber, 2021(10)	CKD 3-5	19	11 (58)	60.2 (10.2)	4 (21)	9 (47)	3 (16)			2 (11)		1 (5)

Abbreviation: CKD, chronic kidney disease; HD, haemodialysis; KTR, kidney transplant recipients; NR, not reported

\*Supplementary publications with the same consumers.

+Reported as mean (SD), unless where specified

#Reported as n (%)

**Table S7. Quality appraisal as reported in the Critical Appraisal Skills Programme(20)**

<b>Study</b>	Were the aims clear?	Is the qualitative method appropriate?	Was the research design appropriate?	Are the frameworks clear, consistent and conceptually coherent?	Was the recruitment strategy appropriate to the aims?	Was the data collected in a way that addressed the issue?	Has the relationship between author and participants been adequately considered?	Have ethical issues been taken into consideration?	Was data analysis sufficiently rigorous?	Is there a clear statement of findings?
<b>Castle, 2021(5)</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Dawson, 2021(17)</b>	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell	Somewhat	Yes	Yes
<b>Khoury, 2019(14)</b>	Yes	Yes	Yes	Can't tell	Yes	Yes	Can't tell	Yes	Yes	Somewhat
<b>Mathur, 2021(19)</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Somewhat
<b>O'Brien, 2020(15)</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Somewhat
<b>Shen, 2022(9)</b>	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell	Somewhat	Yes	Yes
<b>Sieverdes, 2015(18)</b>	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Somewhat
<b>Warner, 2019(13)</b>	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes
<b>Weber, 2021(10)</b>	Yes	Yes	Yes	Somewhat	Somewhat	Yes	Somewhat	Yes	Somewhat	Somewhat

**Table S8. Quality appraisal (MMAT for qualitative, randomised quantitative and mixed-methods studies(21))**

Study designs	Methodological quality criteria	Castle, 2022(6)	Dawson, 2021(16)	Gibson, 2020(11)	Kelly, 2019(12)
<b>Screening questions</b>	S1. Are there clear research questions?	Yes	Yes	Yes	Yes
	S2. Do the collected data allow to address the research questions?	Yes	Yes	Yes	Yes
<b>Qualitative</b>	1.1. Is the qualitative approach appropriate to answer the research question?	Yes	Yes	Yes	Yes
	1.2. Are the data collection methods adequate to address the research question?	Yes	Yes	Yes	Yes
	1.3. Are the findings adequately derived from the data?	Yes	Yes	Yes	Yes
	1.4. Is the interpretation of results sufficiently substantiated by data?	Yes	Can't tell	Yes	Yes
	1.5. Is there coherence with data sources, collection, analysis and interpretation?	Yes	Can't tell	Yes	Yes
<b>Quantitative randomised controlled trials</b>	2.1. Is randomisation appropriately performed?	Yes	Yes	Yes	Yes
	2.2. Are the groups comparable at baseline?	No	Yes	Yes	Yes
	2.3. Are there complete outcome data?	No	Yes	Yes	Yes
	2.4. Are outcome assessors blinded to the intervention provided?	No	Yes	Yes	Can't tell
	2.5. Did the participants adhere to the assigned intervention?	No	No	Yes	Yes
<b>Mixed methods studies</b>	5.1. Is there an adequate rationale for using a mixed methods design to address the research question?	Yes	Yes	Yes	Yes
	5.2. Are the different components of the study effectively integrated to answer the research question?	No	Can't tell	Yes	Yes
	5.3. Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	Can't tell	Can't tell	Yes	Yes
	5.4. Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?	Yes	No	Yes	Yes
	5.5. Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?	No	No	Yes	Yes

Table S9. Quality appraisal (MMAT for qualitative, non-randomised quantitative and mixed-methods studies(21))

Study designs	Methodological quality criteria	Chang, 2020(8)	Donald, 2022(7)
Screening questions	S1. Are there clear research questions?	Yes	Yes
	S2. Do the collected data allow to address the research questions?	Yes	Yes
Qualitative	1.1. Is the qualitative approach appropriate to answer the research question?	Yes	Yes
	1.2. Are the qualitative data collection methods adequate to address the research question?	Yes	Yes
	1.3. Are the findings adequately derived from the data?	No	Yes
	1.4. Is the interpretation of results sufficiently substantiated by data?	No	Yes
	1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation?	Yes	Yes
Quantitative non-randomised studies	3.1. Are the participants representative of the target population?	Can't tell	Can't tell
	3.2. Are measurements appropriate regarding both the outcome and intervention (or exposure)?	Yes	Yes
	3.3. Are there complete outcome data?	Yes	Yes
	3.4. Are the confounders accounted for in the design and analysis?	No	Can't tell
	3.5 During the study period, is the intervention administered (or exposure occurred) as intended?	Yes	Yes
Mixed methods studies	5.1. Is there an adequate rationale for using a mixed methods design to address the research question?	No	Yes
	5.2. Are the different components of the study effectively integrated to answer the research question?	No	Yes
	5.3. Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	Yes	Yes
	5.4. Are inconsistencies between quantitative and qualitative results adequately addressed?	Yes	Yes
	5.5. Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?	No	Yes

Table S10. Illustrative quotes

Themes	Sub-themes	Quotes
Simple instruction and engaging design	Convey ideas using plain language and simple instruction	“[the nurses] didn’t talk in medical terms that were over your head or try and make it unmanageable.” – CKD 1-3. (Chang, 2020(8))
		“I would like to see something that just puts it in layman’s terms.” - kidney transplant recipient (O’Brien, 2020(15))
		“I’m a simple person and ah I can only understand simple tasks, and one task at a time, give me too many tasks and I freeze over.” – male in his 60s, CKD 3-4. (Warner, 2019(13))
	Organised and engaging program design elevates user-experience	“I think actually the way you have it set up is quite good because you’ve got all the different areas at the start and so you can just go into whichever area you want to or you should really read them all and, you know go from there, you get some valuable information.” – CKD 1-5 nondialysis. (Donald, 2022(7))
		“It would be cool if the app [mHealth app] ranges where green means good or orange means moderate, red means get a hold of your nurse right away, or something. Or hey, this one’s red, this has been forwarded to your nurse.” - kidney transplant recipient (O’Brien, 2020(15))
Individually tailored approach	Personal and psycho-social factors influence motivation and capacity for change	“You know some of us, we just sit back, we don’t care. After my transplant what else?” – kidney transplant recipient. (Castle, 2021(5))
		“I was going good there for a while. I actually lost I think two and a half kilos. But now I’ve put it back on again...I have a lot going on, I’m looking after both of my parents” – male in his 40s, community dialysis. (Dawson, 2021(17))
		“I have just been moving around a lot more and not in a stable environment of being in familiar surroundings, being unable to replicate...the menus...due to my transient nature of where I am presently.” – male, 46 years old, CKD 3-4. (Kelly, 2019(12))
	Personalised interventions support engagement	“Maybe under different tabs for example- different link or tab. This is for older people with less strength. And then for I don’t know, younger participants? Because I have seen some there was some transplant participants (hospital name), they are younger. They can lift more whilst they recover.” – kidney transplant recipient. (Castle, 2022(6))
		“The phone calls were flexible as far as the time... It wasn’t “this is the time and this is the only time.” “I think that everything was pretty much personalised, yes...the dietician seemed to be... interested in me.” – CKD 1-3. (Chang, 2020(8))
		“I think that it can be better if there are some detailed guidance and those are tailored for me, not for everyone.” - female, 51 years old, CKD 3 (Shen, 2022(9))
A virtual community in care	Promotes provider-consumer partnership	“I knew I’d be getting another [text message] this week... we were like going walking on the road together.” - female in his 60s, CKD 3-4. (Warner, 2019(13))
		“Can you share [my information] with my, uh, physiotherapist? Like he is the one that’s my cheerleader.” – kidney transplant recipient. (Mathur, 2021(19))
		“The support, even just texting and that, it’s still, you know someone’s doing it. It’s, it just makes you feel better as a person, to know someone cares.” - male, 64 years old, CKD 3-4. (Kelly, 2019(12))
	Connects people with common care experience	“a site if there’s something interactive on it... webinar, [or] a patient forum so that people can feel safe chatting with other patients.” - CKD 1-5 non-dialysis. (Donald, 2022(7))
Provide education and action plan	Increase access to lifestyle information and services	“it helps to see what other kidney transplant patients were going through...so it’s a really good support group without getting out of the house.” – kidney transplant recipient. (Gibson, 2020(11))
		Having [the phone calls every 2 weeks] was very beneficial ...15-20, 25 minutes depending on the topic... it’s good to have... that person to talk to, to go back to, um query what are you doing, is it right and um, and how to improve . . . having it regular, not just that “Ah well I’ve got to go and see the dietitian now and then I won’t see them again for another 6 months...” – male in his 40s, CKD 3-4. (Warner, 2019(13))
		“Doctors can know our [disease] status at home. We can communicate with doctors directly online.” - Female, 43 years old, CKD 2. (Shen, 2022(9))
	Consolidate knowledge and	“I liked having access to the resources and the tools. Like I had questions and it was nice to have them answered.” – kidney transplant recipient. (Gibson, 2020(11))
		“you know rather than going on the internet, rather than going on you know other websites and stuff I found that this particular website that there was a lot on there to help.” – kidney transplant recipient. (Castle, 2022(6))

	prevent misinformation	“eHealth applications need to be certified and trusted ... the experts who register in the applications need to be trusted, [...] such as with a detailed introduction of their medical background. (male, 37 years old, CKD 2. (Shen, 2022(9))
		“Online knowledge of food with high potassium is not detailed and sometimes conflicting.” - male, 34 years old, CKD 5 non-dialysis. (Shen, 2022(9))
	Inform healthy choices and support habit formation	“It’s kind of hard to know how much [exercise] you can do, how much you can’t because at first, you don’t want to do anything (laughter). Yeah. You can’t even read a book. Erm it’s really nice to have guidelines and know where you’re supposed to be. I think it’s a really good idea.” – female kidney transplant recipient. (Castle, 2021(5))
		“You’ve got to eat these foods, food groups and that, but you don’t actually know the right quantities...this program shows it to you and it’s like, it’s teaching someone how to walk again.” - male, 46 years old, CKD 3-4 (Kelly, 2019(12)).
		“Sometimes you don’t know what to eat, what to buy and [the information] helped.” – female in her 70s, in-centre dialysis. (Dawson, 2021(17))
	Provides encouragement for healthy behaviours	“because of dialysis you get really tired and lethargic... whenever I got the text it was motivation...I should get up and go walking...it encourages you to get up and do some exercise” – female in her 40s, home dialysis. (Dawson, 2021(17))
		“...it got me off of my duff to be motivated to do it [physical activity] even more and once I started doing it and I realised it was really helping me feel a lot better. It really gave me drive to continue to do it. It made me watch what I ate a lot closer than I ever have in my life.” – male kidney transplant recipient (Gibson, 2020(11)).
		“If I do exercise, what if I damage my new kidney, that’s the only thing that comes to your mind...: but when I saw the exercises on there, it was very much um, you know puts you at ease and you know, you knowing that it’s not anything that is going to hurt you physically.” – female kidney transplant recipient (Castle, 2021(5)).
		“That’s what encouraged me to go on [with the telehealth intervention], because I could see the change, as I was making little adjustments and they were only little adjustments, they weren’t big adjustments... all these little adjustments amount to great leaps and bounds” - male in his 60s, CKD 3-4 (Warner, 2019(13)).
<b>Timely reminders and automated behavioural monitoring</b>	Timely and personalised reminders prompt action	“If I didn’t have the phone calls from [my coach] once a fortnight I probably wouldn’t have taken it as serious as I have.” - male, 65 years old, CKD 3-4 (Kelly, 2019(12)).
		“If you sit down all day, like if you have a sit down desk job, it’ll beep and it’ll say it’s time to stand up. That would be neat if we could do something like, ‘Hey, have you stood up in the last half hour.’” – kidney transplant recipient (O’Brien, 2020(15)).
		“My memory is not real good... that’s why I actually liked it [the reminder], because it was jogging my memory.” – male in his 40s, community dialysis (Dawson, 2021(17)).
	Monitoring behaviour promotes accountability	“I thought it was a good tool and I what I liked in the app is it would give you the sodium level of the meal and then it’d give you a tally at the end of the day...it’s real time data throughout the day at the end of the day so you know where you’re at. I thought that was pretty good, I like that.” – CKD 1-3a (Chang, 2020(8)).
		“So it got me back to a place where I was consistently working out and then setting goals and attaining those goals...the least favourite part [tracking] is the most helpful part...I knew those things but it just made me accountable and cognisant of what I was actually doing and not doing versus what I thought I was doing.” – female kidney transplant recipient (Gibson, 2020(11)).
	Automated data capture enhances behavioural monitoring	“[Monitoring parameters in] the app is easier and much more convenient than recording them in a notebook.” - female, 32 years old, CKD 5 with peritoneal dialysis (Shen, 2022(9)).
		“It [app] could tell if you’re getting dehydrated. You know, like your creatinine goes way up quick, and you just don’t feel right. It [app] should be able to tell you if you didn’t drink enough water.” – kidney transplant recipient (O’Brien, 2020(15)).
		“It’d be so much helpful if when I typed in rice, [the app] automatically put name brands under it so you could select one. Then after that, it’ll give you the measurements, whether it was a cup and a half or two cups and a half...” - kidney transplant recipient (O’Brien, 2020(15)).

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