A Meta-analysis of eHealth Interventions to Promote Physical Activity in Young, Middle-Aged, and Late Middle-Aged Adults with Obesity or Overweight

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Table 1s

Database, Search Keywords, and Search Results

database	search keywords	search results
CINAHL	S1: physical activity OR physical training OR exercis* OR aerobic OR walk OR running OR bicycle OR cycling OR swim OR yoga OR danc* OR gardening S2: eHealth OR mHelath OR digital OR computer OR web OR online OR internet OR mobile application OR phone OR email OR exergame* OR accelerometer* S3: adults with obesity OR adults with overweight OR obese adult OR obese patient S4: S1 AND S2 AND S3	255 results (01/01/2010 - 05/23/2022) + 36 results (05/24/2022 - 10/29/2024)
Cochrane	#1: (physical activity):ti,ab,kw OR (physical training):ti,ab,kw OR (exercis*):ti,ab,kw OR (aerobic):ti,ab,kw AND (walk):ti,ab,kw #2: (digital):ti,ab,kw OR (online):ti,ab,kw OR (internet):ti,ab,kw OR (web):ti,ab,kw OR (app):ti,ab,kw #3: (adults with obesity):ti,ab,kw OR (adults with overweight):ti,ab,kw OR (obese adult):ti,ab,kw OR (obese patient):ti,ab,kw #4: #1 AND #2 AND #3	946 results (01/01/2010 - 05/23/2022) + 136 results (05/24/2022 - 10/29/2024)
Embase	#1: ('physical activity':ti,ab,kw OR 'physical training':ti,ab,kw OR exercis*:ti,ab,kw OR aerobic:ti,ab,kw OR walk:ti,ab,kw OR running:ti,ab,kw OR bicycle:ti,ab,kw OR cycling:ti,ab,kw OR swim:ti,ab,kw OR yoga:ti,ab,kw OR danc*:ti,ab,kw OR gardening:ti,ab,kw) AND ([controlled clinical trial]/lim OR [randomized controlled trial]/lim) #2: (ehealth:ti,ab,kw OR mhelath:ti,ab,kw OR digital:ti,ab,kw OR computer:ti,ab,kw OR web:ti,ab,kw OR online:ti,ab,kw OR internet:ti,ab,kw OR 'mobile application':ti,ab,kw OR phone:ti,ab,kw OR 'text messag*':ti,ab,kw OR email:ti,ab,kw OR 'electronic mail':ti,ab,kw OR multimedia:ti,ab,kw OR exergame*:ti,ab,kw OR accelerometer*:ti,ab,kw OR pedometer:ti,ab,kw) AND ([controlled clinical trial]/lim OR [randomized controlled trial]/lim) #3: ('adults with obesity' OR (('adults'/exp OR adults) AND with AND ('obesity'/exp OR obesity)) OR 'adults with overweight' OR (('adults'/exp OR adults) AND with AND ('overweight'/exp OR overweight)) OR 'obese adult' OR (obese AND ('adult'/exp OR adult)) OR 'obese patient'/exp OR 'obese patient' OR (obese AND ('patient'/exp OR patient))) AND ([controlled clinical trial]/lim OR [randomized controlled trial]/lim) #4: #1 AND #2 AND #3	945 results (01/01/2010 - 05/23/2022) + 148 results (05/24/2022 - 10/29/2024)

database	search keywords	search results
PsycINFO	S1: (noft(physical activity) OR noft(physical training) OR noft(exercis*) OR noft(aerobic) OR noft(walk) OR noft(running) OR noft(bicycle) OR noft(cycling) OR noft(swim) OR noft(yoga)) AND PEER(yes) S2: (noft(eHealth) OR noft(mHelath) OR noft(digital) OR noft(computer) OR noft(web) OR noft(online) OR noft(internet) OR noft(app) OR noft(phone) OR noft(email)) AND PEER(yes) S3: ((adults with obesity) OR (adults with overweight) OR (obese adult) OR (obese patient)) AND PEER(yes) S4: (S1 AND S2 AND S3) AND me.exact("Empirical Study" NOT ("Meta Analysis" OR "Literature Review" OR "Systematic Review" OR "Brain Imaging" OR "Mathematical Model"))	192 results (01/01/2010 - 05/23/2022) + 137 results (05/24/2022 - 10/29/2024)
PubMed	#1: ((((((((((physical activity) OR (physical training)) OR (exercis*)) OR (aerobic)) OR (walk)) OR (running)) OR (bicycle)) OR (cycling)) OR (swim)) OR (yoga)) OR (danc*)) OR (gardening) #2: ((((((((((((((eHealth) OR (mHelath)) OR (digital)) OR (computer)) OR (web)) OR (online)) OR (internet)) OR (mobile application)) OR (phone)) OR (text messag*)) OR (email)) OR (electronic mail)) OR (multimedia)) OR (exergame*)) OR (accelerometer*)) OR (pedometer) #3: (((adults with obesity) OR (adults with overweight)) OR (obese adult)) OR (obese patient) #4: #1 AND #2 AND #3	1554 results (01/01/2010 - 05/23/2022) + 534 results (05/24/2022 - 10/29/2024)

Table 2s

Reasons for Exclusion of Each Study During Second-Step Full-Text Screening of Retrieved Articles

reference	1. year/ articles	2. eHealth for PA	3. RCT to test eHealth	4. age 18-65	5. BMI 25 or higher	6. PA assessment	7. sufficient statistical information	8. not pilot or feasibility studies	9. not gray literature	eligibility
1	1	0	1	1	1	1	0	1	1	0
2	0	0	1	1	0	1	0	1	1	0
3	1	0	0	1	1	1	0	1	1	0
4	1	0	1	1	1	1	1	1	1	0
5	1	1	1	1	1	1	1	1	1	1
6	1	0	1	0	1	1	1	1	1	0
7	1	1	1	1	1	1	1	0	1	0
8	1	0	1	0	1	1	1	0	1	0
9	1	0	1	0	1	1	1	1	1	0
10	1	0	1	1	1	1	1	1	1	0
11	1	1	1	0	1	1	0	1	1	0
12	1	1	1	1	1	0	0	1	1	0
13	0	1	1	1	1	0	0	1	1	0
14	1	1	1	0	1	1	1	1	1	0
15	1	1	0	0	1	1	1	1	1	0
16	1	0	1	1	1	1	0	1	1	0
17	1	1	1	0	1	0	0	1	1	0
18	1	0	1	0	1	1	0	1	1	0
19	1	0	1	0	1	1	0	1	1	0
20	1	0	1	1	1	1	1	0	1	0
21	1	0	1	0	1	1	1	0	1	0
22	1	1	1	0	1	1	1	0	1	0
23	1	1	1	0	1	1	1	1	1	0

reference	1. year/ articles	2. eHealth for PA	3. RCT to test eHealth	4. age 18-65	5. BMI 25 or higher	6. PA assessment	7. sufficient statistical information	8. not pilot or feasibility studies	9. not gray literature	eligibility
24	1	1	1	1	0	1	0	1	1	0
25	0	1	1	1	0	1	0	1	1	0
26	0	1	0	0	0	1	0	1	1	0
27	1	1	1	0	1	1	1	1	1	0
28	1	0	0	0	1	1	0	0	1	0
29	1	0	1	1	1	1	1	0	1	0
30	1	0	1	1	1	1	0	1	1	0
31	1	1	1	0	1	1	0	1	1	0
32	0	1	1	1	1	1	1	1	1	0
33	1	0	0	0	0	1	1	0	1	0
34	1	1	1	0	1	1	0	0	1	0
35	1	0	1	1	1	1	1	1	1	0
36	0	0	1	0	1	1	1	1	1	0
37	1	1	1	1	1	1	1	1	1	1
38	1	0	1	0	1	1	1	1	1	0
39	1	0	1	0	1	1	0	1	1	0
40	1	1	1	0	1	1	1	1	1	0
41	1	1	0	0	1	1	1	1	1	0
42	1	1	1	1	1	1	1	0	1	0
43	1	1	1	1	1	1	0	1	1	2
44	1	0	1	0	1	1	0	0	1	0
45	1	1	1	0	1	1	1	1	1	0
46	1	0	1	1	1	1	1	1	1	0
47	1	1	1	0	1	1	0	1	1	0
48	1	1	1	0	1	1	1	0	1	0
49	0	1	1	0	1	1	0	1	1	0

reference	1. year/ articles	2. eHealth for PA	3. RCT to test eHealth	4. age 18-65	5. BMI 25 or higher	6. PA assessment	7. sufficient statistical information	8. not pilot or feasibility studies	9. not gray literature	eligibility
50	0	0	1	0	0	1	1	1	1	0
51	1	1	1	0	1	1	0	1	1	0
52	1	1	1	0	1	1	0	1	1	0
53	1	1	1	1	1	1	0	1	1	0
54	1	1	1	0	1	0	0	1	1	0
55	1	0	1	1	0	1	0	0	1	0
56	1	0	1	1	1	0	0	1	1	0
57	1	1	1	1	1	0	0	1	1	0
58	1	1	1	0	1	1	1	1	1	0
59	1	1	0	1	1	1	0	1	1	0
60	0	0	1	1	1	1	1	1	1	0
61	1	0	1	1	1	1	1	1	1	0
62	1	0	1	0	1	1	1	1	1	0
63	0	1	1	0	1	1	0	1	1	0
64	1	1	0	1	1	1	1	0	1	0
65	1	0	1	1	1	1	0	1	1	0
66	1	0	1	0	0	1	0	1	1	0
67	1	0	1	1	1	1	0	0	1	0
68	1	1	0	1	1	1	0	0	1	0
69	1	1	1	1	1	1	1	1	1	1
70	1	1	1	0	1	1	0	1	1	0
71	1	0	0	0	1	1	0	1	1	0
72	1	1	1	1	1	1	1	1	1	1
73	0	0	1	0	1	1	0	1	1	0
74	0	1	1	1	1	1	1	1	1	0
75	1	0	0	0	0	1	1	1	1	0

reference	1. year/ articles	2. eHealth for PA	3. RCT to test eHealth	4. age 18-65	5. BMI 25 or higher	6. PA assessment	7. sufficient statistical information	8. not pilot or feasibility studies	9. not gray literature	eligibility
76	1	1	1	1	1	0	0	1	1	0
77	0	1	1	1	1	1	0	1	1	0
78	0	0	1	1	1	1	0	1	1	0
79	1	1	1	1	1	1	0	1	1	2
80	1	1	1	0	1	0	0	0	1	0
81	1	1	1	0	1	1	0	1	1	0
82	1	0	1	1	1	1	0	1	1	0
83	0	1	1	1	1	1	0	1	1	0
84	1	1	1	0	1	1	0	1	1	0
85	1	1	1	1	1	1	1	1	1	1
86	1	1	1	1	1	1	1	1	1	1
87	1	1	0	1	1	1	1	1	1	0
88	0	0	1	0	0	1	0	1	0	0
89	1	1	0	0	0	0	0	1	1	0
90	1	1	1	0	1	1	1	1	1	0
91	1	1	1	1	1	1	1	1	1	1
92	1	1	1	1	1	1	1	1	1	1
93	1	0	1	1	1	1	1	0	1	0
94	0	1	0	1	1	1	1	1	1	0
95	1	0	1	0	0	1	1	1	1	0
96	0	1	1	0	1	1	1	0	1	0
97	0	1	0	0	1	1	0	0	1	0
98	0	0	1	0	1	1	1	1	1	0
99	1	0	1	0	1	1	1	1	1	0
100	1	1	0	1	1	1	0	1	1	0
101	1	1	1	1	1	1	1	1	1	1

reference	1. year/ articles	2. eHealth for PA	3. RCT to test eHealth	4. age 18-65	5. BMI 25 or higher	6. PA assessment	7. sufficient statistical information	8. not pilot or feasibility studies	9. not gray literature	eligibility
102	1	1	1	1	1	1	1	0	1	0
103	1	1	1	1	1	1	0	1	1	2
104	1	1	0	0	1	1	1	0	1	0
105	1	0	1	0	0	1	1	0	1	0
106	1	0	1	0	1	1	1	0	1	0
107	0	1	1	0	1	1	1	1	1	0
108	1	1	1	0	1	1	1	1	1	0
109	1	0	0	1	1	1	1	0	1	0
110	1	0	1	1	1	1	0	1	1	0
111	1	1	1	1	1	1	1	1	1	1
112	1	0	1	1	1	1	1	1	1	0
113	1	0	1	0	0	1	1	0	1	0
114	1	0	0	0	1	1	1	1	1	0
115	1	0	1	1	1	1	0	1	1	0
116	1	1	1	0	1	0	0	1	1	0
117	1	1	1	0	1	1	1	1	1	0
118	1	1	1	0	0	1	0	1	1	0
119	1	1	0	0	1	1	0	1	1	0
120	1	1	0	1	1	1	0	1	1	0
121	0	0	1	0	1	1	1	1	1	0
122	1	0	1	0	1	1	0	1	1	0
123	1	0	0	1	1	1	1	1	1	0
124	1	0	0	1	1	1	0	1	1	0
125	1	1	1	1	1	0	0	1	1	0
126	0	1	1	0	1	1	0	1	1	0
127	1	0	0	0	1	1	0	1	1	0

reference	1. year/ articles	2. eHealth for PA	3. RCT to test eHealth	4. age 18-65	5. BMI 25 or higher	6. PA assessment	7. sufficient statistical information	8. not pilot or feasibility studies	9. not gray literature	eligibility
128	1	0	0	0	0	1	1	1	1	0
129	1	0	1	0	1	1	1	1	1	0
130	1	1	1	1	1	1	0	1	1	2
131	1	1	1	0	1	1	0	1	1	0
132	1	1	0	0	1	1	1	1	1	0
133	1	1	1	0	1	1	1	0	1	0
134	1	0	0	0	0	1	0	1	1	0
135	1	1	0	0	1	1	0	1	1	0
136	0	1	1	0	0	1	1	1	1	0
137	1	1	1	0	1	1	1	1	1	0
138	1	1	0	0	1	1	1	1	1	0
139	1	1	0	0	1	1	0	1	1	0
140	1	1	0	0	1	1	0	1	1	0
141	1	1	1	1	0	1	1	1	1	0
142	0	0	1	0	1	1	1	1	1	0
143	1	1	1	1	1	1	1	0	1	0
144	1	1	1	0	0	1	1	1	1	0
145	1	1	1	1	1	0	0	1	1	0
146	1	1	1	0	0	1	1	1	1	0
147	1	1	1	1	1	1	1	1	1	1
148	1	1	1	0	1	1	1	1	1	0
149	1	1	0	1	1	1	1	1	1	0
150	1	0	1	1	1	1	1	0	1	0
151	1	1	0	0	1	1	0	1	1	0
152	1	1	0	1	0	1	1	1	1	0

reference	1. year/ articles	2. eHealth for PA	3. RCT to test eHealth	4. age 18-65	5. BMI 25 or higher	6. PA assessment	7. sufficient statistical information	8. not pilot or feasibility studies	9. not gray literature	eligibility
153	1	1	1	0	1	1	0	1	1	0
154	1	0	1	0	1	0	0	1	1	0
155	1	1	0	0	1	0	0	1	1	0
156	1	1	1	1	1	1	0	1	1	2
157	1	1	1	1	1	1	1	1	1	1
158	1	1	1	0	1	1	1	1	1	0
159	1	0	1	0	1	1	0	1	1	0
160	1	0	1	0	1	1	1	1	1	0
161	1	1	1	0	1	1	1	1	1	0
162	1	1	1	1	1	1	0	1	1	2
163	1	1	0	0	0	1	1	0	1	0
164	1	1	1	0	1	1	1	0	1	0
165	1	1	1	0	0	1	1	1	1	0
166	1	1	0	0	1	1	0	1	1	0
167	1	0	1	0	1	1	1	1	1	0
168	1	1	0	1	1	1	0	1	1	0
169	1	0	0	1	1	1	1	1	1	0
170	1	1	1	0	1	1	0	1	1	0
171	1	1	0	0	0	0	0	1	1	0
172	1	1	0	0	1	1	0	1	1	0
173	1	1	0	0	0	1	0	1	1	0
174	1	1	0	0	0	1	0	1	1	0
175	1	1	1	1	1	0	0	1	1	0
176	1	1	1	1	0	1	0	1	1	0

reference	1. year/ articles	2. eHealth for PA	3. RCT to test eHealth	4. age 18-65	5. BMI 25 or higher	6. PA assessment	7. sufficient statistical information	8. not pilot or feasibility studies	9. not gray literature	eligibility
177	1	0	1	0	1	1	0	1	1	0
178	1	1	1	1	1	1	1	0	1	0
179	1	1	1	0	1	1	1	1	1	0
180	1	1	0	0	0	1	1	1	1	0
181	1	1	1	1	1	1	1	1	1	1
182	1	1	1	0	1	0	0	1	1	0
183	1	1	1	0	0	1	0	1	1	0
184	1	1	0	0	0	1	0	1	1	0
185	1	1	1	0	1	1	0	1	1	0
186	1	1	0	0	1	1	1	1	1	0
187	1	1	0	0	1	1	1	1	1	0
188	1	1	1	0	1	1	0	1	1	0
189	1	1	0	1	1	0	0	1	1	0
190	1	1	0	0	1	0	0	1	1	0
191	1	1	1	0	1	1	0	1	1	0
exclusion percent	13%	35%	26%	59%	16%	10%	50%	17%	1%	

Note. 0 = not eligible, 1 = eligible, 2 = data requested, PA = physical activity, RCT = randomized controlled trial, BMI = body mass index.

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Table 3s

Characteristic Summary of Included Studies

	Number of Studies (*k*)
Sampling Method	
Not reported	1
Probability sampling	1
Non-probability sampling	12
Assignment Method	
Individualized	12
Clustered	2
Matching	
Yes	4
No	10
Study Location	
US	1
Non-US	8
Not reported	5
Risk of Bias	
High risk	3
Some risk	10
Low risk	1
Gender	
Not reported	1
Mixed gender	8
Male only	1
Female only	4
Ethnicity	
Not reported	7
Multiple ethnic group	6
Only black	1
Weight Status	
Overweight (BMI: 25 - 29.9)	1
Obese (BMI: 30 and above)	2
Overweight and obese	11
Intervention Duration	
Not reported	1
Short term (less than 6 months)	6

Intermediate term (from 6 months to 12 months)	7
Long term (more than 12 months)	0
Theory	
Not used	7
Used	7
Assessment	
Self-reports (including interview with questionnaire)	10
Accelerometers	3
Both self-reports and accelerometers	1