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Internet-based treatment for eating disorders: bridging the treatment gap

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Publications

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Curriculum Vitae

Pieter Johannes Rohrbach was born in Alphen aan den Rijn, the Netherlands, on 2 November 1991. After following secondary education at the Groene Hart Lyceum, Alphen aan den Rijn, he started studying Psychology at Leiden University (2009-2012) and completed the master Clinical Psychology (2012-2014). From 2014-2017, Pieter completed his second master in Media Technology at Leiden University cum laude. Meanwhile, he participated in a 3-year minor at the Royal Conservatory of The Hague, practicing jazz drums. In 2017 Pieter started his PhD research at GGZ Rivierduinen Eating Disorders, in collaboration with the Leiden University Medical Center and Leiden University, where he could combine knowledge obtained from the two masters of Clinical Psychology and Media Technology by researching e-mental health for eating disorders. The research described in this doctoral dissertation is a reflection of Pieter's scientific output during his PhD studies.

Chapter A

Supplemental Material for Chapter 2

A.1 SPIRIT Checklist

SPIRIT 2013 Checklist: Recommended items to address in a clinical trial protocol and related documents*

Section/item	Item No	Description	Page
Administrative information			
Title	1	Descriptive title identifying the study design, population, interventions, and, if applicable, trial acronym	1
Trial registration	2a	Trial identifier and registry name. If not yet registered, name of intended registry	4
	2b	All items from the World Health Organization Trial Registration Data Set	1
Protocol version	3	Date and version identifier	32
Funding	4	Sources and types of financial, material, and other support	33-34
Roles and responsibilities	5a	Names, affiliations, and roles of protocol contributors	1-2
	5b	Name and contact information for the trial sponsor	1
	5c	Role of study sponsor and funders, if any, in study design; collection, management, analysis, and interpretation of data; writing of the report; and the decision to submit the report for publication, including whether they will have ultimate authority over any of these activities	33-34
	5d	Composition, roles, and responsibilities of the coordinating centre, steering committee, endpoint adjudication committee, data management team, and other individuals or groups overseeing the trial, if applicable (see Item 21a for data monitoring committee)	n.a.
Introduction			
Background and rationale	6a	Description of research question and justification for undertaking the trial, including summary of relevant studies (published and unpublished) examining benefits and harms for each intervention	4-10
	6b	Explanation for choice of comparators	4-10
Objectives	7	Specific objectives or hypotheses	8-10

Trial design	8	Description of trial design including type of trial (eg, parallel group, crossover, factorial, single group), allocation ratio, and framework (eg, superiority, equivalence, noninferiority, exploratory)	10-11
Methods: Participants, interventions, and outcomes			
Study setting	9	Description of study settings (eg, community clinic, academic hospital) and list of countries where data will be collected. Reference to where list of study sites can be obtained	11
Eligibility criteria	10	Inclusion and exclusion criteria for participants. If applicable, eligibility criteria for study centres and individuals who will perform the interventions (eg, surgeons, psychotherapists)	11
Interventions	11a	Interventions for each group with sufficient detail to allow replication, including how and when they will be administered	11-13
	11b	Criteria for discontinuing or modifying allocated interventions for a given trial participant (eg, drug dose change in response to harms, participant request, or improving/worsening disease)	n.a.
	11c	Strategies to improve adherence to intervention protocols, and any procedures for monitoring adherence (eg, drug tablet return, laboratory tests)	12-13 and 13-14
	11d	Relevant concomitant care and interventions that are permitted or prohibited during the trial	13
Outcomes	12	Primary, secondary, and other outcomes, including the specific measurement variable (eg, systolic blood pressure), analysis metric (eg, change from baseline, final value, time to event), method of aggregation (eg, median, proportion), and time point for each outcome. Explanation of the clinical relevance of chosen efficacy and harm outcomes is strongly recommended	8-9 and 14-22
Participant timeline	13	Time schedule of enrolment, interventions (including any run-ins and washouts), assessments, and visits for participants. A schematic diagram is highly recommended (see Figure)	10-11 and Figure 1 and Table 1
Sample size	14	Estimated number of participants needed to achieve study objectives and how it was determined, including clinical and statistical assumptions supporting any sample size calculations	25
Recruitment	15	Strategies for achieving adequate participant enrolment to reach target sample size	11
Methods: Assignment of interventions (for controlled trials)			
Allocation:			
Sequence generation	16a	Method of generating the allocation sequence (eg, computer-generated random numbers), and list of any factors for stratification. To reduce predictability of a random sequence, details of any planned restriction (eg, blocking) should be provided in a separate document that is unavailable to those who enrol participants or assign interventions	10-11

Allocation concealment mechanism	16b	Mechanism of implementing the allocation sequence (eg, central telephone; sequentially numbered, opaque, sealed envelopes), describing any steps to conceal the sequence until interventions are assigned	10
Implementation	16c	Who will generate the allocation sequence, who will enrol participants, and who will assign participants to interventions	10
Blinding (masking)	17a	Who will be blinded after assignment to interventions (eg, trial participants, care providers, outcome assessors, data analysts), and how	10
	17b	If blinded, circumstances under which unblinding is permissible, and procedure for revealing a participant's allocated intervention during the trial	n.a.
Methods: Data collection, management, and analysis			
Data collection methods	18a	Plans for assessment and collection of outcome, baseline, and other trial data, including any related processes to promote data quality (eg, duplicate measurements, training of assessors) and a description of study instruments (eg, questionnaires, laboratory tests) along with their reliability and validity, if known. Reference to where data collection forms can be found, if not in the protocol	14-22
	18b	Plans to promote participant retention and complete follow-up, including list of any outcome data to be collected for participants who discontinue or deviate from intervention protocols	22 and 23
Data management	19	Plans for data entry, coding, security, and storage, including any related processes to promote data quality (eg, double data entry; range checks for data values). Reference to where details of data management procedures can be found, if not in the protocol	30-31
Statistical methods	20a	Statistical methods for analysing primary and secondary outcomes. Reference to where other details of the statistical analysis plan can be found, if not in the protocol	25-30
	20b	Methods for any additional analyses (eg, subgroup and adjusted analyses)	27-28
	20c	Definition of analysis population relating to protocol non-adherence (eg, as randomised analysis), and any statistical methods to handle missing data (eg, multiple imputation)	26
Methods: Monitoring			
Data monitoring	21a	Composition of data monitoring committee (DMC); summary of its role and reporting structure; statement of whether it is independent from the sponsor and competing interests; and reference to where further details about its charter can be found, if not in the protocol. Alternatively, an explanation of why a DMC is not needed	31
	21b	Description of any interim analyses and stopping guidelines, including who will have access to these interim results and make the final decision to terminate the trial	n.a.
Harms	22	Plans for collecting, assessing, reporting, and managing solicited and spontaneously reported adverse events and other unintended effects of trial interventions or trial conduct	n.a.

Auditing	23	Frequency and procedures for auditing trial conduct, if any, and whether the process will be independent from investigators and the sponsor	n.a.
Ethics and dissemination			
Research ethics approval	24	Plans for seeking research ethics committee/institutional review board (REC/IRB) approval	11 and 34
Protocol amendments	25	Plans for communicating important protocol modifications (eg, changes to eligibility criteria, outcomes, analyses) to relevant parties (eg, investigators, REC/IRBs, trial participants, trial registries, journals, regulators)	n.a.
Consent or assent	26a	Who will obtain informed consent or assent from potential trial participants or authorised surrogates, and how (see Item 32)	23
	26b	Additional consent provisions for collection and use of participant data and biological specimens in ancillary studies, if applicable	n.a.
Confidentiality	27	How personal information about potential and enrolled participants will be collected, shared, and maintained in order to protect confidentiality before, during, and after the trial	30-31
Declaration of interests	28	Financial and other competing interests for principal investigators for the overall trial and each study site	33-34
Access to data	29	Statement of who will have access to the final trial dataset, and disclosure of contractual agreements that limit such access for investigators	30-31 and 34
Ancillary and post-trial care	30	Provisions, if any, for ancillary and post-trial care, and for compensation to those who suffer harm from trial participation	23-25
Dissemination policy	31a	Plans for investigators and sponsor to communicate trial results to participants, healthcare professionals, the public, and other relevant groups (eg, via publication, reporting in results databases, or other data sharing arrangements), including any publication restrictions	34
	31b	Authorship eligibility guidelines and any intended use of professional writers	n.a.
	31c	Plans, if any, for granting public access to the full protocol, participant-level dataset, and statistical code	n.a.
Appendices			
Informed consent materials	32	Model consent form and other related documentation given to participants and authorised surrogates	n.a.
Biological specimens	33	Plans for collection, laboratory evaluation, and storage of biological specimens for genetic or molecular analysis in the current trial and for future use in ancillary studies, if applicable	n.a.

*It is strongly recommended that this checklist be read in conjunction with the SPIRIT 2013 Explanation & Elaboration for important clarification on the items. Amendments to the protocol should be tracked and dated. The SPIRIT checklist is copyrighted by the SPIRIT Group under the Creative Commons “Attribution-NonCommercial-NoDerivs 3.0 Unported” license.

A.2 Integrity checklist psychologist/expert-patient sessions

The current session is an EMAIL / CHAT

A. Structure

The following elements should ALL be present in an email or a chat session:

E-mail	Chat
1.Extraction of the question 2.Formulation of an answer 3.Ending	1.Warm welcome 2.Establishing the topic 3.Establishing what will be discussed in the current chat 4.Discussing the topic / conveying support or advice 5.Ending
All present? YES / NO	All present? YES / NO

B. Content/Interventions

The aim of the intervention is to make people aware of their eating problems and to provide ways/suggestions to enlarge this insight, counteract eating related problems and/or to stimulate seeking help.

NOTE. If a method/delivery/intervention falls under more categories it only counts as one (no double counts).

The session took at least 20 minutes	YES / NO
The situation was assessed / summarized for participants	YES / NO
The topic of conversation was established	YES / NO
Count the interventions present in the form of:	AMOUNT
1. Giving support / empathy	1
2. Reflecting feelings	2
3. Motivating	3
4. Expressing concern	4
5. Asking for more clarity	5
Count the interventions present in the form of:	AMOUNT
1. Providing Psychoeducation	1
2. Providing advice	2
3. Concretizing aims or goals	3
4. Stimulating thinking / reflection	4
5. Confronting	5
6. Challenging cognitions / beliefs	6
7. Suggesting to seek help / treatment	7
8. Explain procedures	8

9. Other. . .	9
At the end of the session	
1. the participant knows what to do in the short term (coming week)	YES / NO
2. concrete advice or directions are provided by the supporter	YES / NO
3. suggestion(s) about dealing with obstacles or difficulties is/are provided	YES / NO
NUMBER OF 'YES' (range 0-6)	
NUMBER OF INTERVENTIONS (sum of interventions)	

C. Method of Delivery

Contents the way in which interventions are delivered to the participant.

NOTE. If a method/delivery/intervention falls under more categories it only counts as one (no double counts).

A. Interventions were present in the form of:	
1. Sharing (common) knowledge or scientific findings to introduce or complement advice or psychoeducation	YES / NO
2. Sharing (common) knowledge or scientific findings to show support or to reduce stigma/feelings of shame (“many people with eating problems. . .”)	YES / NO
3. Presenting solutions to problems by mentioning (directly) that is has been found to work in research or by other people (“. . . works for many people with eating problems”)	YES / NO
4. Sharing one’s own experience in a way that a participant feels recognized / to break stigmatization / to give hope to participants	YES / NO
5. Sharing one’s own experience to offer advice	YES / NO
6. Sharing one’s own experience to stimulate seeking help or treatment	YES / NO
7. Sharing one’s own experience to offer psychoeducation	YES / NO
B1 At the end of the session it is evident that the supporter is a person with knowledge about the problems the participant is currently struggling with and maintains a psychologist approach	YES / NO
B2 At the end of the session it is evident that the supporter has had experience with (a form of) the problems the participant is currently struggling with	YES / NO
C1 The supporter never talks about his/her own life (e.g. a situation, feeling/emotion, thought(process), difficulty, success) during the session	YES / NO
C2 The supporter has revealed something (e.g. a situation, feeling/emotion, thought(process), difficulty, success) about his/her life as a tool to offer support to the participant during the session (can overlap with the first check of this table)	YES / NO
D The supporter never uses medical terminology or medical abbreviations (or if it used: explains what the term/abbreviation means or verifies that the participant knows what the term/abbreviation means)	YES / NO

E1 I (the rater) believe the supporter is a psychologist	YES / NO
E2 I (the rater) believe the supporter is an expert patient	YES / NO

Integrity - Final Score		
A	Structure	YES / NO
B	Content	
	Number of interventions used	...
	Number of YES (range 0-6)	...
C	Method	
	Number of YES in A1-3, B1, C1, E1 (range 0-6)	...
	Number of YES in A4-7, B2, C2, D1, E2 (range 0-8)	...

Chapter B

Supplemental Material for Chapter 3

B.1 Overview of statistical models

Condition contrasts (CC)

Condition	CC1	CC2	CC3
Waiting list control	-1	0	0
Feedback	1/3	-1/2	-1
Expert-patient support	1/3	-1/2	1
Feedback + Expert-patient support (combination)	1/3	1	0

Time contrasts (TC)

Measurement	TC1	TC2	TC3	TC4	TC5
T0, baseline	-1	0	0	0	0
T1, post intervention	1	-1	-1	-1	-1
T2, 3-month FU	0	1	0	0	0
T3, 6-month FU	0	0	1	0	0
T4, 9-month FU	0	0	0	1	0
T5, 12-month FU	0	0	0	0	1

The fifteen possible condition and time contrast combinations were tested separately for the Eating Disorder Examination Questionnaire, General Self-Efficacy Scale, 4-item Patient Health Questionnaire and the 12-item Social Support List (see Table B2.1). Multiple testing was accounted for using a Bonferroni adjustment.

B.2 Results of all tested models

Abbreviations

CC=Condition contrast, CI = confidence interval, TC=Time contrast

CC1 = Three active interventions (Feedback only, expert-patient support only and Feedback plus expert-patient support) versus waiting list control condition

CC2 = Feedback plus expert-patient support condition versus Feedback only and expert-patient support only

CC3 = Feedback only versus expert-patient support only

TC1 = baseline versus post intervention

TC2 = post intervention versus 3-month follow-up

TC3 = post intervention versus 6-month follow-up

TC4 = post intervention versus 9-month follow-up

TC5 = post intervention versus 12-month follow-up

B2.1 Tested statistical models for the Eating Disorder Examination Questionnaire

CC	TC	Time effects		Time-condition interaction effects		Cohen's <i>d</i>
		β (95% CI)	<i>t</i> (<i>p</i>)	β (95% CI)	<i>t</i> (<i>p</i>)	
1	1	-0.18 (-0.22; -0.14)	-8.12 (< .001)	-0.15 (-0.22; -0.07)	-3.66 (< .001)	0.38
1	2	-0.12 (-0.18; -0.07)	-4.34 (< .001)	0.05 (-0.04; 0.15)	1.05 (.30)	0.11
1	3	-0.16 (-0.22; -0.09)	-4.48 (< .001)	0.05 (-0.07; 0.17)	0.88 (.38)	0.11
1	4	-0.23 (-0.31; -0.15)	-5.73 (< .001)	0.11 (-0.04; 0.26)	1.49 (.14)	0.20
1	5	-0.27 (-0.35; -0.19)	-6.67 (< .001)	0.16 (0.02; 0.29)	2.26 (.02)	0.25
2	1	-0.23 (-0.28; -0.18)	-8.81 (< .001)	-0.04 (-0.12; 0.03)	-1.17 (.24)	0.12
2	2	-0.11 (-0.17; -0.04)	-3.35 (< .001)	0.01 (-0.08; 0.10)	0.24 (.81)	0.03
2	3	-0.14 (-0.21; -0.06)	-3.57 (< .001)	0.02 (-0.09; 0.13)	0.34 (.74)	0.04
2	4	-0.19 (-0.28; -0.11)	-4.28 (< .001)	-0.03 (-0.15; 0.10)	-0.41 (.68)	-0.05
2	5	-0.22 (-0.31; -0.13)	-4.87 (< .001)	-0.04 (-0.18; 0.09)	-0.64 (.52)	-0.09
3	1	-0.21 (-0.26; -0.15)	-6.73 (< .001)	0.01 (-0.06; 0.07)	0.17 (.87)	0.02
3	2	-0.11 (-0.19; -0.03)	-2.78 (.01)	0.06 (-0.02; 0.14)	1.52 (.13)	0.21
3	3	-0.15 (-0.24; -0.06)	-3.13 (< .001)	0.02 (-0.07; 0.12)	0.52 (.60)	0.07
3	4	-0.18 (-0.29; -0.07)	-3.33 (< .001)	0.06 (-0.05; 0.17)	1.05 (.30)	0.16
3	5	-0.20 (-0.31; -0.09)	-3.66 (< .001)	0.01 (-0.09; 0.12)	0.25 (.80)	0.04

B2.2 Tested statistical models for the 4-item Patient Health Questionnaire

CC	TC	Time effects		Time-condition interaction effects		Cohen's <i>d</i>
		β (95% CI)	<i>t</i> (<i>p</i>)	β (95% CI)	<i>t</i> (<i>p</i>)	
1	1	-0.41 (-0.58; -0.23)	-4.61 (< .001)	-0.22 (-0.52; 0.08)	-1.43 (.15)	0.12
1	2	-0.08 (-0.25; 0.08)	-1.00 (.32)	0.16 (-0.12; 0.44)	1.11 (.27)	0.11
1	3	-0.07 (-0.26; 0.12)	-0.74 (.46)	-0.07 (-0.39; 0.26)	-0.42 (.68)	0.05
1	4	-0.17 (-0.39; 0.05)	-1.51 (.13)	0.14 (-0.27; 0.54)	0.67 (.51)	0.08
1	5	-0.42 (-0.63; -0.20)	-3.85 (< .001)	0.24 (-0.13; 0.60)	1.28 (.20)	0.13
2	1	-0.48 (-0.68; -0.27)	-4.56 (< .001)	-0.14 (-0.43; 0.15)	-0.94 (.35)	0.10
2	2	-0.03 (-0.21; 0.16)	-0.30 (.76)	-0.16 (-0.42; 0.11)	-1.14 (.25)	-0.13
2	3	-0.10 (-0.31; 0.12)	-0.87 (.38)	0.22 (-0.07; 0.51)	1.47 (.14)	0.17
2	4	-0.12 (-0.37; 0.13)	-0.95 (.34)	0.08 (-0.28; 0.44)	0.43 (.67)	0.05
2	5	-0.34 (-0.59; -0.09)	-2.67 (.01)	0.10 (-0.24; 0.44)	0.59 (.55)	0.07
3	1	-0.41 (-0.66; -0.15)	-3.14 (< .001)	0.13 (-0.13; 0.38)	0.96 (.34)	0.11
3	2	0.05 (-0.17; 0.27)	0.43 (.66)	-0.01 (-0.23; 0.21)	-0.06 (.95)	0.01
3	3	-0.20 (-0.46; 0.05)	-1.6 (.11)	0.10 (-0.15; 0.34)	0.79 (.43)	0.10
3	4	-0.16 (-0.47; 0.15)	-1.03 (.30)	-0.06 (-0.38; 0.26)	-0.36 (.72)	0.05
3	5	-0.39 (-0.69; -0.09)	-2.52 (.01)	-0.20 (-0.5; 0.1)	-1.33 (.19)	0.18

B2.3 Tested statistical models for the General Self-Efficacy Scale

CC	TC	Time effects		Time-condition interaction effects		Cohen's <i>d</i>
		β (95% CI)	<i>t</i> (<i>p</i>)	β (95% CI)	<i>t</i> (<i>p</i>)	
1	1	0.09 (-0.18; 0.35)	0.65 (.52)	0.09 (-0.40; 0.59)	0.37 (.71)	0.04
1	2	0.16 (-0.09; 0.42)	1.23 (.22)	-0.08 (-0.55; 0.40)	-0.32 (.75)	0.04
1	3	0.13 (-0.12; 0.38)	1.02 (.31)	-0.08 (-0.55; 0.39)	-0.34 (.73)	0.04
1	4	0.21 (-0.16; 0.58)	1.10 (.27)	-0.29 (-0.99; 0.42)	-0.80 (.43)	0.12
1	5	0.38 (0.07; 0.69)	2.40 (.02)	-0.15 (-0.73; 0.43)	-0.50 (.62)	0.06
2	1	0.12 (-0.19; 0.43)	0.75 (.45)	-0.14 (-0.59; 0.31)	-0.61 (.54)	0.07
2	2	0.14 (-0.16; 0.43)	0.90 (.37)	-0.15 (-0.56; 0.27)	-0.70 (.48)	0.09
2	3	0.11 (-0.18; 0.40)	0.72 (.47)	-0.20 (-0.62; 0.22)	-0.94 (.35)	0.12
2	4	0.11 (-0.31; 0.54)	0.53 (.59)	-0.32 (-0.90; 0.26)	-1.09 (.28)	0.15
2	5	0.33 (-0.03; 0.70)	1.78 (.08)	-0.32 (-0.85; 0.21)	-1.20 (.23)	0.16
3	1	0.19 (-0.20; 0.58)	0.96 (.34)	-0.14 (-0.52; 0.25)	-0.71 (.48)	0.09
3	2	0.21 (-0.14; 0.57)	1.16 (.25)	-0.07 (-0.44; 0.30)	-0.35 (.72)	0.05
3	3	0.21 (-0.16; 0.57)	1.11 (.27)	0.03 (-0.34; 0.40)	0.17 (.87)	0.02
3	4	0.28 (-0.21; 0.76)	1.12 (.26)	0.08 (-0.40; 0.56)	0.34 (.74)	0.05
3	5	0.50 (0.05; 0.94)	2.20 (.03)	0.18 (-0.25; 0.61)	0.82 (.41)	0.12

B2.4 Tested statistical models for the 12-item Social Support List

CC	TC	Time effects		Time-condition interaction effects		Cohen's <i>d</i>
		β (95% CI)	<i>t</i> (<i>p</i>)	β (95% CI)	<i>t</i> (<i>p</i>)	
1	1	-0.04 (-0.35; 0.26)	-0.28 (.78)	-0.19 (-0.72; 0.35)	-0.69 (.49)	0.07
1	2	-0.16 (-0.49; 0.17)	-0.94 (.35)	0.02 (-0.58; 0.62)	0.07 (.94)	0.01
1	3	-0.17 (-0.54; 0.20)	-0.90 (.37)	0.37 (-0.27; 1.02)	1.14 (.26)	0.13
1	4	-0.10 (-0.57; 0.38)	-0.39 (.70)	0.18 (-0.61; 0.97)	0.44 (.66)	0.06
1	5	0.35 (-0.10; 0.80)	1.52 (.13)	0.20 (-0.58; 0.97)	0.50 (.62)	0.06
2	1	-0.11 (-0.46; 0.24)	-0.60 (.55)	0.17 (-0.33; 0.66)	0.66 (.51)	0.07
2	2	-0.15 (-0.52; 0.23)	-0.77 (.44)	-0.58 (-1.14; -0.02)	-2.05 (.04)	0.29
2	3	-0.04 (-0.46; 0.38)	-0.20 (.84)	-0.27 (-0.93; 0.39)	-0.80 (.43)	0.12
2	4	-0.03 (-0.55; 0.49)	-0.12 (.91)	-0.46 (-1.22; 0.30)	-1.19 (.23)	0.17
2	5	0.42 (-0.09; 0.93)	1.62 (.11)	-0.52 (-1.27; 0.23)	-1.36 (.17)	0.19
3	1	-0.19 (-0.58; 0.20)	-0.95 (.34)	-0.14 (-0.54; 0.26)	-0.69 (.49)	0.09
3	2	0.14 (-0.30; 0.58)	0.63 (.53)	-0.29 (-0.71; 0.14)	-1.31 (.19)	0.18
3	3	0.09 (-0.42; 0.60)	0.35 (.73)	-0.24 (-0.76; 0.28)	-0.91 (.36)	0.13
3	4	0.20 (-0.42; 0.81)	0.63 (.53)	-0.05 (-0.67; 0.57)	-0.16 (.87)	0.03
3	5	0.68 (0.09; 1.27)	2.26 (.02)	-0.23 (-0.79; 0.34)	-0.78 (.44)	0.11

B.3 Reliable Change Index

To calculate the reliable change index (RCI) the method described by Jacobson & Truax (1991) was used.

The standard deviation (SD) of the Eating Disorder Examination Questionnaire (EDE-Q, primary outcome measure) total scores at baseline was 1.04. Cronbach's α between the 22 items that constitute the EDE-Q total score was used as the reliability measure. Cronbach's α was .90. The RCI was calculated with the following formula.

$$RCI = \sqrt{2 * SE^2} * 1.96$$

Where

$$SE = SD * \sqrt{1 - \alpha}$$

The RCI was 0.89. Derived from the RCI, the number of participants (averaged across 100 imputed datasets) showing reliable deterioration, no change and reliable improvement was 14, 261 and 80 respectively. No significant difference in these frequencies between conditions was found, $\chi^2(6) = 11.14, p = .08$. Frequencies of reliable deterioration, no change and reliable improvement per condition can be found in Table B3.1. Mean change in EDE-Q scores from baseline to post intervention was 0.38 (pooled $SD = 0.76$), with higher scores meaning more improvement. The mean (SD) in the Feedback, combination, expert-patient support and waitlist condition was 0.42 (0.72), 0.54 (0.71), 0.40 (0.85) and 0.06 (0.70) respectively.

B3.1 Frequencies of reliable deterioration, no change and reliable improvement per condition ($N = 355$)

	Feedback ($N = 88$)	Feedback + Expert- patient support ($N = 90$)	Expert- patient support ($N = 87$)	Waiting list ($N = 90$)	Total sample ($N = 355$)
Reliable deterioration	3	3	1	7	14
No change	65	61	65	71	261
Reliable improvement	20	26	21	12	80

Note. Table rows may not add up to the frequencies shown in the 'total sample' column, because of rounding to whole participants across 100 imputed datasets.

Reference

Jacobson, N. S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology, 59*, 12-19. <https://doi.org/10.1037//0022-006x.59.1.12>

B.4 Intervention check results

To verify that support sessions carried out by expert patients were different from those by psychologists, an intervention check was created and rated by two master level psychology students (see study protocol for the intervention check). The two raters evaluated 15 chat and 15 email sessions of psychologist and 15 chat and 15 email sessions of expert patients. Hypotheses in the study protocol concerning the intervention check are addressed here in six separate questions.

Question 1: Could raters distinguish interventions between psychologists and expert patients?

Across the two raters, for 94% of the sessions the supporter was correctly identified as psychologist or expert patient. Agreement between raters was 95%. Additionally, it was hypothesized that methods to convey interventions would differ between psychologists and expert-patients. Indeed, expert-patient deliveries (i.e., interventions that include own experiences) were more frequent than psychologist deliveries (i.e., interventions that include common or scientific knowledge) in sessions executed by expert patients, and less frequent than psychologist deliveries in sessions executed by psychologists (this was true for 95% of the sessions). Similarly, typical psychologist deliveries were more frequent in sessions by psychologists and less frequent in expert-patient sessions compared to expert-patient deliveries (this was true for 95% of the sessions). In other words, expert patients were more likely to convey interventions using their own experiences, while psychologists were more likely to convey interventions using research or (common) knowledge.

Question 2: Is the structure of chats and emails similar between psychologists and expert patients?

The structure of emails and chats as described in the training protocol for psychologists and expert patients (see study protocol) was followed in all sessions (100% agreement between the two raters). Additionally, structure scores (scale 0 – 6) were calculated based on (1) sessions took 20 minutes, (2) situation was assessed or summarized, (3) topic of conversation was established, (4) participant knew what to do in the short term after the session, (5) concrete advice or directions were provided by the supporter, and (6) suggestions to deal with anticipated obstacles to reach the goals were provided. The mean structure score across sessions was 4.8 ($SD = 1.0$) with no difference in structure scores between expert patients and psychologists (pooled mean difference = 0.1, pooled $SE = 0.4$, pooled $t(3) = 0.32$, $p = .38$).

Question 3: Do psychologists use a broader pallet of (more distinct) interventions?

On average, supporters used 5.5 (pooled $SD = 1.2$) types of interventions (see integrity checklist from study protocol for the full list of interventions). Furthermore, psychologist used significantly more interventions types (a broader pallet of interventions) than expert patients, pooled mean difference = 1.1, pooled $SE = 0.4$, $t(56) = 2.55$, $p < .01$.

Question 4: Do expert patients mention their own experiences in sessions?

Expert patients shared at least some of their own experiences in 93% of the sessions (agree-

ment between raters was 100%).

Question 5: Do psychologists never mention their own experiences in sessions?

Psychologists never shared their own experiences in 100% of the sessions (agreement between raters was 100%).

Question 6: Do psychologists use more medical terms than expert patients?

Medical terms were not used in any of the sessions (100% agreement between raters), regardless of whether the supporter was an expert patient or psychologist.

B.5 Results on intervention usage, satisfaction, help-seeking intentions and behaviors and other e-health use

Assessments will be indicated by the abbreviations T1, T2, T3, T4, T5 for post intervention, 3, 6, 9 and 12-month follow up, respectively. These results are exploratory and based on completed data only. Specifically, intervention usage is based on all participants in the three active intervention conditions; 88, 90 and 87 participants for the Featback, combination and expert-patient support condition respectively. Satisfaction results are based on 212 participants measured at T1. For help-seeking and e-health use results are based on 275 (T1), 249 (T2), 242 (T3), 232 (T4) and 242 (T5) participants.

Intervention usage

In the two conditions where participants could make use of the automated messages system, the average amount of Featback sessions used was 6.03 ($SD = 3.02$, range 0-8). The average amount of used support sessions in the two expert-patient support conditions was 3.97 ($SD = 3.02$, range 0-9). In total, 1074 Featback sessions and 702 support sessions were used. Participants planned 806 sessions, meaning that 104 support sessions did not happen because the participant did not show. Of the 702 used support sessions 368 (52.4%) were via email and 334 (47.6%) via chat, with no differences between the two conditions with expert-patient support in preference for email, $t(175) = 0.47$, $p = .64$, or chat, $t(175) = 1.59$, $p = .12$. Participants in the combined condition with access to both Featback and expert-patient support used significantly less Featback sessions (mean difference = -0.84, $SE = 0.37$; $t(176) = 2.28$, $p = .024$), but not less support sessions (mean difference = -0.83, $SE = 0.45$; $t(175) = 1.86$, $p = .066$) in comparison to the Featback only and expert-patient support only conditions respectively.

Looking at the total amount of sessions used, significant differences were apparent between the intervention conditions ($F(2, 262) = 37.67$, $p < .001$). Participants used the least amount of sessions in the expert-patient support only condition (mean = 4.39, $SD = 3.07$), more in the Featback only condition (mean = 6.45, $SD = 2.09$) and most sessions were used in the combined condition with access to both Featback and expert-patient support (mean = 9.18, $SD = 5.16$), with all comparisons $p < .001$. When looking at intervention usage as percentage of the possible amount of sessions (i.e., 8 in the Featback only and expert-patient support only conditions and 16 in the combined condition) a significant difference was found ($F(2, 262) = 16.80$, $p < .001$) with the Featback only condition having a higher intervention usage (80.7%) compared to the expert-patient support only condition (54.9%), $t(152) = 5.20$, $p < .001$, and the combined condition (57.4%), $t(170) = 5.31$, $p < .001$. There was no apparent difference in this measure of intervention usage between the two conditions with expert-patient support, $t(167.90) = 0.46$, $p = .64$.

Satisfaction

Participants indicated to be satisfied (on a scale from 1 to 10) with the intervention, with a significant difference between the conditions, $F(2, 192) = 15.98$, $p < .001$. The Featback only condition received a lower rating (mean = 5.84, $SD = 1.79$) than the combined

condition (mean = 7.06, $SD = 1.69$), $t(131) = 4.03$, $p < .001$, and the expert-patient only condition (mean = 7.43, $SD = 1.63$), $t(130) = 5.34$, $p < .001$, with no difference between the expert-patient support only and combined conditions, $t(123) = 1.26$, $p = .21$. The total amount of completed Featback and/or expert-patient sessions correlated positively with satisfaction ratings ($r = .18$; $\beta = 0.09$, $t(193) = 2.61$, $p = .010$, indicating that completing more sessions was associated with higher satisfaction. Further exploration revealed no differences in intervention satisfaction between participants who indicated never to have had eating disorder related treatment ($N = 78$, mean = 6.7, $SD = 1.7$) and those who did ($N = 117$, mean = 6.8, $SD = 1.9$), $t(193) = 0.16$, $p = .87$. Details per condition are presented below.

Featback only condition (N = 72)

Overall grade (scale of 1 lowest – 10 highest): 5.8 ($SD = 1.8$).

Participants were neutral about the quality ($M = 3.0$, $SD = 0.8$; scale 1 excellent – 4 poor) and received support ($M = 4.1$, $SD = 1.5$; scale 1 very dissatisfied – 7 very satisfied) of Featback. The majority of participants ($n = 46$, 63.9%) in this condition did not learn new things from the program, but it did help to make participants ($n = 42$, 58.3%) more aware of their problems. Sixty (83.3%) of the participants thought the feedback of the messages was at least moderately applicable. All participants thought the idea of individual monitoring to be good. The most useful features in this condition were rated to be the weekly feedback on well-being, the tips and advice in the Featback messages and the feeling of working towards recovery. Free text on negative aspects of Featback concerned (1) the program being too shallow or focusing too little on underlying mechanisms, (2) the program not being intensive/long enough, (3) missing personal contact/someone to talk to, (4) messages not being applicable or useful. Positive aspects of Featback concerned (1) making one aware of one's problems, (2) motivating messages containing diverse and useful advice, (3) being low-threshold and a good first step.

Featback and expert-patient support (N = 72)

Overall grade (scale of 1 lowest – 10 highest): 7.1 ($SD = 1.7$).

Participants in this condition were satisfied with the quality ($M = 2.6$, $SD = 0.9$; scale 1 excellent – 4 poor) and received support ($M = 5.1$, $SD = 1.4$; scale 1 very dissatisfied – 7 very satisfied). The majority of participants ($n = 48$, 66.7%) learned new things from the intervention and it helped to make participants ($n = 53$, 73.6%) more aware of their problems. Sixty-four (88.9%) of the participants thought the feedback of the automated messages was at least moderately applicable. All participants thought the idea of individual monitoring to be good and almost all participants (63, 87.5%) thought the idea of extra individual support of an expert patient to be good. The most useful feature in this condition was rated to be the expert-patient support. Other useful features were the weekly feedback on wellbeing, the tips and advice in the Featback messages and the feeling of working towards recovery. Negative and positive aspects of the Featback messages were similar to those described before. Negative aspects of the expert-patient support concerned (1) 20-minute chats were too short, (2) no match regarding the eating disorder between participant and supporter, (3) technical problems with making appointments or chats. Positive aspects of the expert-patient support concerned (1) the warm and empathic approach of expert pa-

tients, (2) having someone to talk to/being recognized/not feeling alone or crazy, (3) honest and open feedback that was applicable, (4) gaining insight.

Expert-patient support ($N = 68$)

Overall grade (scale of 1 lowest – 10 highest): 7.4 ($SD = 1.6$).

Positive and negative aspects of expert-patient support were similar to those mentioned before. The main negative aspect was that many participants argued that 20-minute chat sessions were very brief. The main positive aspect was that many participants felt recognized and easily understood, which was the basis for fruitful contact with useful advice.

Help seeking intentions and behaviors

Help seeking intentions and behaviors and the influence of the active interventions were inquired. Participants reported (on a 7-point scale) to believe to be in need of help at T1 ($M = 5.6$, $SD = 1.5$) and across T1-T5 ($M = 5.0$, pooled $SD = 1.8$) and even more in need of professional help at T1 ($M = 5.9$, $SD = 1.4$) and across T1-T5 ($M = 5.7$, pooled $SD = 1.5$). At T1-T5 150 (54.5%), 156 (62.7%) 140 (57.9%) 125 (53.9%) 130 (36.6%) participants indicated to have pursued professional help because of disordered eating or body dissatisfaction. The majority went to treatment facilities or a psychologist. Of the participants who pursued professional help 22.0% (T1), 12.8% (T2), 16.3% (T3), 15.9% (T4) and 16.9% (T5) indicated that the intervention stimulated them to take this step.

Some participants (ranging from 10/108 (9.3%) at T4 and 28/130 (21.5%) at T1) did not seek out professional help, but did have intentions to do so. Of these participants 57.7% (T1), 81.8% (T2), 38.5% (T3), 55.6% (T4) and 42.9% (T5) indicated that the intervention stimulated them to form the intention to pursue professional help.

However, a majority of participants (ranging from 102/130 (78.5%) at T1 to 98/108 (90.7%) at T4) who did not pursue professional help also did not have intentions to seek help. Most named reasons for not pursuing help were (1) not considering the problems to be serious enough, (2) not wanting others to find out about the eating problem, (3) feelings of shame, (4) fear of stigmatization, (5) worries about costs, (6) not knowing where to go and (7) believing that health professionals will only make it worse or will not understand or take it seriously.

eHealth use

The majority of participants, specifically 193 (70.2%), 191 (76.7%), 161 (66.7%), 150 (64.7%) and 148 (61.2%) at T1, T2, T3, T4 and T5, indicated to have used websites beside Featback in relation to their eating problems. The number of participants using a forum declined from 134 (48.7%) at T1 to 70 (28.9%) at T5, with the majority of participants indicating not to have used a forum, 141 (51.3%) at T1 and 172 (71.1%) at T5. Of the participants who indicated to have used a forum around one third actively participated by posting content themselves; on average 31.1% (range 26.3%-35.7%) at each assessment. Lastly, participants were asked whether they have made use of another email or chat service for their eating problem. On average 15.2% (range 12.0%-18.1%) of participants at each assessment had made use of another email or chat service, mostly provided by the Proud2Bme community.

Chapter C

Supplemental Material for Chapter 4

C.1 Prisma 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review	- Title
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	- Abstract
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	- Introduction
Rationale	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	- Pooling cost-effectiveness data: last paragraph
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	- Eligibility criteria
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.	- Search strategy and selection criteria
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	- Search strategy and selection criteria - Multimedia Appendix
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.	- Search strategy and selection criteria: last paragraph
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.	- Search strategy and selection criteria: last paragraph

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.	- Data preparation - Multimedia Appendix
	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.	- Data preparation - Multimedia Appendix
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.	- Quality assessment
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.	- Statistical analyses - Table 1
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)).	- Table 2 and 3 - Statistical analyses: moderators
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	- Data preparation - Table 1
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	- Table 2 and 3 - Statistical analyses: heterogeneity and publication bias
	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.	- Statistical analyses - Statistical analyses: pooling incremental net benefits - Statistical analyses: heterogeneity and publication bias
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	- Statistical analyses: moderators
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	- Statistical analyses: sensitivity analyses
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 assessment - Statistical analyses: sensitivity analyses
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	- Statistical analyses: sensitivity analyses

RESULTS

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 - Table 2 and 3 - Characteristics of included studies
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	- Multimedia Appendix

Study characteristics	17	Cite each included study and present its characteristics.	- Table 2 and 3
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	- Table 4 - Table 5
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.	- Table 2 and 3
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	- Risk of bias and quality of economic evaluation - Sensitivity analyses
	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.	- Quality of life - Costs - Cost-effectiveness - Moderator analyses
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	- Sensitivity analyses - Cost-effectiveness
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	- Publication bias - Sensitivity analyses
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	- Sensitivity analyses
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed. 95% CIs are presented.	- Quality of life - Costs - Cost-effectiveness - Moderator analyses - Sensitivity analyses
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	- Discussion: first paragraph
	23b	Discuss any limitations of the evidence included in the review.	- QALYs and mental health interventions - Meta-analyses on cost-effectiveness data
	23c	Discuss any limitations of the review processes used.	- Limitations
	23d	Discuss implications of the results for practice, policy, and future research.	- Discussion: first and second paragraph - Future directions
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.	- Abstract - Methods
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	- Abstract - Methods
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	- Deviations from the protocol
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	- Acknowledgements
Competing interests	26	Declare any competing interests of review authors.	- Conflicts of interest

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.	All available upon reasonable request - Multimedia Appendix
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C.2 Full Pubmed search string

(mental disorders[Mesh] OR mental illness[tiab] OR mental disorder[tiab] OR psychological disorder[tiab] OR psychological illness[tiab] OR psychological disease[tiab] OR psychiatric disorder[tiab] OR psychiatric illness[tiab] OR psychiatric disease[tiab] OR mood[tiab] OR anxiety[tiab] OR anxiety disorders[tiab] OR agoraphobia[tiab] OR separation anxiety[tiab] OR neurocirculatory Asthenia[tiab] OR neurotic Disorders[tiab] OR obsessive-compulsive[tiab] OR hoarding disorder[tiab] OR panic disorder[tiab] OR phobic disorders[tiab] OR social phobia[tiab] OR bipolar and related disorders[tiab] OR bipolar[tiab] OR disruptive disorders[tiab] OR impulse control[tiab] OR conduct disorders[tiab] OR firesetting behavior[tiab] OR gambling[tiab] OR trichotillomania[tiab] OR dissociative disorders[tiab] OR dissociative identity disorder[tiab] OR elimination disorders[tiab] OR encopresis[tiab] OR enuresis[tiab] OR diurnal enuresis[tiab] OR nocturnal enuresis[tiab] OR feeding and eating disorders[tiab] OR eating disorders[tiab] OR anorexia nervosa[tiab] OR binge-eating[tiab] OR bulimia nervosa[tiab] OR feeding and eating disorders of childhood[tiab] OR female athlete triad syndrome[tiab] OR food addiction[tiab] OR night eating[tiab] OR pica[tiab] OR mood disorders[tiab] OR cyclothymic disorder[tiab] OR depressive disorder[tiab] OR depression[tiab] OR postpartum depression[tiab] OR major depressive disorder[tiab] OR treatment-resistant depressive disorder[tiab] OR dysthymic disorder[tiab] OR premenstrual dysphoric disorder[tiab] OR seasonal affective disorder[tiab] OR motor disorders[tiab] OR neurocognitive disorders[tiab] OR amnesia[tiab] OR anterograde amnesia[tiab] OR retrograde amnesia[tiab] OR transient global amnesia[tiab] OR cognition disorders[tiab] OR auditory perceptual disorders[tiab] OR cognitive dysfunction OR Huntington disease[tiab] OR consciousness disorders[tiab] OR delirium[tiab] OR emergence delirium[tiab] OR dementia[tiab] OR AIDS dementia complex[tiab] OR Alzheimer[tiab] OR primary progressive aphasia[tiab] OR primary progressive nonfluent aphasia[tiab] OR Creutzfeldt-Jakob[tiab] OR vascular dementia[tiab] OR multi-infarct dementia[tiab] OR diffuse neurofibrillary tangles with calcification[tiab] OR frontotemporal lobar degeneration[tiab] OR frontotemporal dementia[tiab] OR Pick disease of the brain[tiab] OR Kluver-Bucy syndrome[tiab] OR Lewy Body disease[tiab] OR acquired dyslexia[tiab] OR pure alexia[tiab] OR neurodevelopmental disorders[tiab] OR attention deficit and disruptive behavior disorders[tiab] OR ADHD[tiab] OR ADD[tiab] OR attention deficit disorder with hyperactivity[tiab] OR conduct disorder[tiab] OR child behavior disorders[tiab] OR pervasive child development disorders[tiab] OR autism[tiab] OR Asperger syndrome[tiab] OR autistic[tiab] OR communication disorders[tiab] OR language disorders[tiab] OR agraphia[tiab] OR anomia[tiab] OR dyslexia[tiab] OR language development disorders[tiab] OR speech disorders[tiab] OR aphasia[tiab] OR Broca aphasia[tiab] OR conduction aphasia[tiab] OR primary progressive aphasia[tiab] OR primary progressive nonfluent aphasia[tiab] OR Wernicke aphasia[tiab] OR articulation disorders[tiab] OR dysarthria[tiab] OR echolalia[tiab] OR mutism[tiab] OR stuttering[tiab] OR learning disorders[tiab] OR dyscalculia[tiab] OR acquired dyslexia[tiab] OR developmental disabilities[tiab] OR intellectual disability[tiab] OR learning disorders[tiab] OR motor skills disorders[tiab] OR mutism[tiab] OR reactive attachment disorder[tiab] OR childhood schizophrenia[tiab] OR stereotypic movement disorder[tiab] OR tic disorders[tiab] OR Tourette syndrome[tiab] OR neurotic disorders[tiab] OR paraphilic disorders[tiab] OR exhibitionism[tiab] OR fetishism[tiab] OR masochism[tiab] OR pedophilia[tiab] OR sadism[tiab] OR transvestism[tiab] OR voyeurism[tiab] OR personality

disorder[tiab] OR antisocial personality disorder[tiab] OR borderline personality disorder[tiab] OR compulsive personality disorder[tiab] OR dependent personality disorder[tiab] OR histrionic personality disorder[tiab] OR hysteria[tiab] OR paranoid personality disorder[tiab] OR passive-aggressive personality disorder[tiab] OR schizoid personality disorder[tiab] OR schizotypal personality disorder[tiab] OR schizophrenia spectrum and other psychotic disorders[tiab] OR schizophrenia spectrum[tiab] OR psychotic affective disorders[tiab] OR Capgras syndrome[tiab] OR delusional parasitosis[tiab] OR Morgellons disease[tiab] OR paranoid disorders[tiab] OR psychotic disorders[tiab] OR substance-induced psychoses[tiab] OR alcoholic psychoses[tiab] OR schizophrenia[tiab] OR catatonic schizophrenia[tiab] OR disorganized schizophrenia[tiab] OR paranoid schizophrenia[tiab] OR shared paranoid disorder[tiab] OR psychological sexual dysfunctions[tiab] OR dyspareunia[tiab] OR erectile dysfunction[tiab] OR gender dysphoria[tiab] OR premature ejaculation[tiab] OR sexual and gender disorders[tiab] OR vaginismus[tiab] OR sleep wake disorders[tiab] OR dyssomnias[tiab] OR sleep deprivation[tiab] OR circadian rhythm sleep disorders[tiab] OR jet lag syndrome[tiab] OR intrinsic sleep disorders[tiab] OR disorders of excessive somnolence[tiab] OR idiopathic hypersomnolence[tiab] OR Kleine-Levin syndrome[tiab] OR narcolepsy[tiab] OR cataplexy[tiab] OR restless legs syndrome[tiab] OR sleep initiation and maintenance disorders[tiab] OR parasomnias[tiab] OR nocturnal myoclonus syndrome[tiab] OR nocturnal paroxysmal dystonia[tiab] OR REM sleep parasomnias[tiab] OR REM sleep behavior disorder[tiab] OR sleep paralysis[tiab] OR sleep arousal disorders[tiab] OR night terrors[tiab] OR somnambulism[tiab] OR sleep bruxism[tiab] OR sleep-wake transition disorders[tiab] OR somatoform disorders[tiab] OR body dysmorphic[tiab] OR conversion disorder[tiab] OR factitious disorders[tiab] OR Munchausen syndrome[tiab] OR Munchausen syndrome by proxy[tiab] OR hypochondriasis[tiab] OR neurasthenia[tiab] OR substance-related disorders[tiab] OR addiction[tiab] OR alcohol-related disorders[tiab] OR alcohol amnestic disorder[tiab] OR alcoholic Korsakoff syndrome[tiab] OR alcohol withdrawal delirium[tiab] OR alcoholic intoxication[tiab] OR alcoholism [tiab] OR binge drinking[tiab] OR alcoholic psychoses[tiab] OR Wernicke encephalopathy[tiab] OR amphetamine-related disorders[tiab] OR cocaine-related disorders[tiab] OR inhalant abuse[tiab] OR marijuana abuse[tiab] OR marijuana use[tiab] OR neonatal abstinence syndrome[tiab] OR opioid-related disorders[tiab] OR heroin dependence[tiab] OR morphine dependence[tiab] OR opium dependence[tiab] OR phencyclidine abuse[tiab] OR substance-induced psychoses[tiab] OR intravenous substance abuse[tiab] OR oral substance abuse[tiab] OR substance withdrawal syndrome[tiab] OR tobacco use disorder[tiab] OR trauma and stressor related disorders[tiab] OR adjustment disorders[tiab] OR traumatic stress disorders[tiab] OR battered child syndrome[tiab] OR combat disorders[tiab] OR psychological trauma[tiab] OR post-traumatic stress[tiab] OR acute traumatic stress[tiab] OR PTSD[tiab]) **AND** ("telemedicine"[Mesh] OR "telenursing"[Mesh] OR "user-computer interface"[Mesh] OR "multimedia"[Mesh] OR "cell phone"[Mesh] OR "public health informatics"[Mesh] OR "medical informatics"[Mesh] OR "nursing informatics"[Mesh] OR "computers, handheld"[Mesh] OR "mobile applications"[Mesh] OR "internet"[Mesh] OR "patient portals"[Mesh] OR econsult*[tiab] OR e-treat*[tiab] OR e-therap*[tiab] OR e-consult*[tiab] OR edianos*[tiab] OR e diagnos*[tiab] OR mobile health*[tiab] OR mhealth*[tiab] OR m health*[tiab] OR telehealth*[tiab] OR tele health[tiab] OR remote consult*[tiab] OR teleconsult*[tiab] OR tele consult*[tiab] OR telenursing[tiab] OR tele nursing[tiab] OR telediagnos*[tiab] OR tele diagnos*[tiab] OR telemedic*[tiab] OR tele medic*[tiab] OR telemon-

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C.3 Data extraction items

Category	Extracted item
General	<ul style="list-style-type: none"> ● Author ● Year of publication ● Journal ● Country ● Randomized controlled trial (yes/no)
Participants	<ul style="list-style-type: none"> ● Recruitment (com=community/open/mass media; clin=clinical recruitment; scr=systematic screening of a predefined population; other) ● Sample size (total) ● Sample size (per condition) ● % female ● Mean age (standard deviation) ● Targeted mental disorder ● Diagnose (1=formal diagnosis; 2=self-report; 3=other, please specify) ● Instrument for diagnosis ● Inclusion criteria ● Exclusion criteria
Interventions	<ul style="list-style-type: none"> ● Intervention frequency and duration (per condition) ● Follow-up (i.e., time between baseline and last follow-up assessment) ● Assessment time points of quality of life/utility ● Assessment time points of costs/health care use ● Intervention description (per condition) ● Type of guidance (1=fully automated or no guidance; 2=asynchronous or guidance not at the same time such as e-mail/written feedback; 3=synchronous or guidance at the same time such as chat, telephone and face-to-face) ● Intensity of guidance (0=less than once a week; 1=once a week; 2=more than once a week; 3=self-guided; 4=other, please specify)
Questionnaires and methods	<ul style="list-style-type: none"> ● Intention to treat analyses (yes/no) ● Primary outcome + measurement instrument ● Instrument used for quality of life/utility ● Instrument used for costs/health care use ● Source of (health care) unit costs ● Currency + year of indexing ● Discounting (0=none; 1=cost and effects at the same percentage, please specify %; 2=costs and effects at different percentages, please specify both percentages) ● Perspective used (1=health care; 2=societal; 3=other, please specify) ● If societal perspective was used, method for assessing productivity losses (1=friction cost; 2=human capital; 3=other, please specify)

Outcomes	<ul style="list-style-type: none">●QALYs (per condition)●SD/SE/variance/confidence interval of QALYs (per condition)●Delta QALY (i.e., QALYs intervention – QALYs control)●SD/SE/variance/confidence interval of delta QALY●Health care costs (per condition)●SD/SE/variance/confidence interval of health care costs (per condition)●Delta health care costs (i.e., health care costs intervention – health care costs control)●SD/SE/variance/confidence interval of delta health care costs●Societal costs (per condition)●SD/SE/variance/confidence interval of societal costs (per condition)●Delta societal costs (i.e., societal costs intervention – societal costs control)●SD/SE/variance/confidence interval of delta societal costs●Incremental cost-effectiveness ratio●Confidence interval of incremental cost-effectiveness ratio●Cost-effectiveness plane for delta costs and delta QALYs provided (0=no; 1=yes)
Risk of bias	<ul style="list-style-type: none">●Random sequence generation●Allocation concealment●Blinding of participants and personnel●Blinding of outcome assessors●Incomplete outcome data●Selective reporting●Other sources of bias

Quality of economic evaluation (CHEC)	<ul style="list-style-type: none">●Is the study population clearly described?●Are competing alternatives clearly described?●Is a well-defined research question posed in answerable form?●Is the economic study design appropriate to the stated objective?●Is the chosen time horizon appropriate to include relevant costs and consequences?●Is the actual perspective chosen appropriate?●Are all important and relevant costs for each alternative identified?●Are all costs measured appropriately in physical units?●Are costs valued appropriately?●Are all important and relevant outcomes for each alternative identified?●Are all outcomes measured appropriately?●Are outcomes valued appropriately?●Is an incremental analysis of costs and outcomes of alternatives performed?●Are all future costs and outcomes discounted appropriately?●Are all important variables, whose values are uncertain, appropriately subjected to sensitivity analysis?●Do the conclusions follow from the data reported?●Does the study discuss the generalizability of the results to other settings and patient/client groups?●Does the article indicate that there is no potential conflict of interest of study researcher(s) and funder(s)?●Are ethical and distributional issues discussed appropriately?
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SD=standard deviation; SE=standard error; QALY=quality-of-life adjusted life year

C.4 Formulas used for data preparation and final analyses

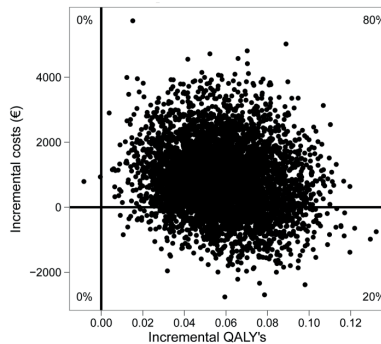
Outcome	Nr.	Formula
Data preparation		
	1	$Var_{\Delta QALY} = SD_{\Delta QALY}^2$
	2	$Var_{\Delta QALY} = SE_{\Delta QALY}^2$
	3	$SE_{\Delta QALY} = \frac{UL - Mean_{\Delta QALY}}{1.96}$
	4	$Var_{\Delta QALY} = \frac{SD_{intervention}^2}{N_{intervention}} + \frac{SD_{control}^2}{N_{control}}$
	5	$Var_{\Delta QALY} = SE_{intervention}^2 + SE_{control}^2$
	6	$Covariance(\Delta QALY, \Delta Costs) = SD_{\Delta QALY} * SD_{\Delta Costs} * r(\Delta QALY, \Delta Costs)$
	7	$INB_{study} = k * \Delta QALY - \Delta Costs$ Where k is society's willingness to pay for one QALY
Pooling studies		
	8	$INB_{pooled} = \sum(weight_{study} * INB_{study})$
	9	$weight_{study} = \frac{1}{Var(INB_{study}) + \tau^2}$
	10	$Var(INB_{study}) = \frac{1/(k^2 * Var_{\Delta QALY} + Var_{\Delta Costs} - 2 * k * Covariance(\Delta QALY, \Delta Costs))}{\sum_{i=1}^{s-1} (1/Var(INB_{study}))}$
	11	$\tau^2 = \frac{\sum_{i=1}^{s-1} (weight_{study})}{\sum_{i=1}^{s-1} (weight_{study})^2}$ Where s is the number of included studies or comparisons, Q is the Cochran statistic and $\tau^2 = 0$ if $Q < s - 1$
Heterogeneity		
	12	$CochranQ = \sum_{i=1}^{s-1} \frac{1}{Var(INB_{study})} * (INB_{study} - INB_{pooled})^2$ Where $Q = 0$ if $Q < s - 1$
	13	$I^2 = \frac{Q - (s-1)}{Q} * 100\%$

Note. The formula used to calculate delta QALY can also be used to calculate delta costs. INB=incremental net benefit; Nr=reference number; QALY=quality-of-life-adjusted life year; SD=standard deviation; SE=standard error; UL=upper limit; Var=variance

C.5 Example of the estimation of the covariance between delta QALY and delta costs with the use of Webplot Digitizer

[Step 1]

Save the target cost-effectiveness plane with delta QALYs (x-axis) and delta costs (y-axis) as an image.

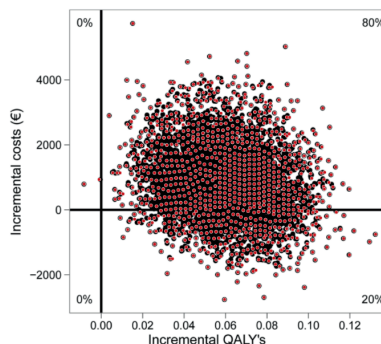


[Step 2]

Upload the image to Webplot Digitizer (<https://automeris.io/WebPlotDigitizer/>). Calibrate x and y values, and select areas to reverse engineer individual data points.

[Step 3]

Run the application and download individual data points into a .csv format.



[Step 4]

Calculate the covariance and, if necessary, the standard deviations of delta QALY and delta costs using the appropriate Excel functions: `=COVARIANCE.S(range delta QALYs; range delta costs)` and `=STDEV.S(range)`.

C.6 Excluded studies with reasons for exclusion

#	Author (year of publication)	Title	Reason for exclusion
1	Adewuya et al. (2019)	The effectiveness and acceptability of mobile telephone adherence support for management of depression in the Mental Health in Primary Care (MeHPriC) project, Lagos, Nigeria: A pilot cluster randomised controlled trial	Wrong outcomes
2	Andersson et al. (2011)	Cost-effectiveness of internet-based cognitive behavior therapy for irritable bowel syndrome: results from a randomized controlled trial	Wrong patient population
3	Andersson et al. (2015)	Cost-effectiveness of an internet-based booster program for patients with obsessive-compulsive disorder: Results from a randomized controlled trial	Wrong outcomes
4	Andersson et al. (2015)	Cost-effectiveness of internet-based cognitive behavior therapy for obsessive-compulsive disorder: Results from a randomized controlled trial	Wrong outcomes
5	Angus et al. (2019)	Cost-effectiveness of strategies to improve delivery of brief interventions for heavy drinking in primary care: results from the ODHIN trial	Wrong study design
6	Axelsson et al. (2018)	Cost-effectiveness and long-term follow-up of three forms of minimal-contact cognitive behaviour therapy for severe health anxiety: Results from a randomised controlled trial	Wrong outcomes
7	Bergstrom et al. (2010)	Internet-versus group-administered cognitive behaviour therapy for panic disorder in a psychiatric setting: a randomised trial	Wrong outcomes
8	Bischof et al. (2010)	Stepped-care intervention for alcohol problems: A cost-effective approach for brief interventions in primary care?	Study protocol
9	Blankers et al. (2012)	Clinical outcomes and economic evaluation of internet-based interventions for harmful alcohol use: a pragmatic randomized trial	Duplicate study
10	Blankers et al. (2012)	Economic evaluation of internet-based interventions for harmful alcohol use alongside a pragmatic randomized controlled trial	Wrong comparator
11	Boege et al. (2015)	Cost-effectiveness of intensive home treatment enhanced by inpatient treatment elements in child and adolescent psychiatry in Germany: A randomised trial	Wrong outcomes
12	Bogosian et al. (2021)	Acceptability and Feasibility of a Mindfulness Intervention Delivered via Videoconferencing for People With Parkinson's	Wrong outcomes
13	Bolier et al. (2014)	Cost-effectiveness of online positive psychology: Randomized controlled trial	Wrong outcomes
14	Botha et al. (2018)	Brief Report: A Randomized Control Trial Assessing the Influence of a Telephone-based Intervention on Readmissions for Patients with Severe Mental Illness in a Developing Country	Wrong outcomes
15	Brabyn et al. (2016)	The second Randomised Evaluation of the Effectiveness, cost-effectiveness and Acceptability of Computerised Therapy (REEACT-2) trial: does the provision of telephone support enhance the effectiveness of computer-delivered cognitive behaviour therapy? A randomised controlled trial	Wrong comparator
16	Budney et al. (2015)	Computer-assisted behavioral therapy and contingency management for cannabis use disorder	Wrong outcomes

17	Calhoun et al. (2016)	Comparative effectiveness of an Internet-based smoking cessation intervention versus clinic-based specialty care for veterans	Wrong outcomes
18	Celano et al. (2015)	Cost-effectiveness of a collaborative care depression and anxiety treatment program in patients with acute cardiac illness	Wrong intervention
19	Chalder et al. (2012)	A pragmatic randomised controlled trial to evaluate the cost-effectiveness of a physical activity intervention as a treatment for depression: the treating depression with physical activity (TREAD) trial	Wrong intervention
20	Chan et al. (2008)	Depression and comorbid PTSD in veterans: Evaluation of collaborative care programs and impact on utilization and costs	Wrong outcomes
21	ChoiYoo et al. (2014)	Cost effectiveness of telecare management for pain and depression in patients with cancer: results from a randomized trial	Wrong outcomes
22	Compen et al. (2017)	Face-to-face versus individual internetbased MBCT versus TAU for distressed cancer patients: The BeMind study	Conference abstract
23	Crow et al. (2009)	The cost effectiveness of cognitive behavioral therapy for bulimia nervosa delivered via telemedicine versus face-to-face	Wrong outcomes
24	Davidson et al. (2013)	Centralized, Stepped, Patient Preference-Based Treatment for Patients With Post-Acute Coronary Syndrome Depression CODIACS Vanguard Randomized Controlled Trial	Wrong outcomes
25	De Boer et al. (2014)	A randomized controlled trial of an Internet-based cognitive-behavioural intervention for non-specific chronic pain: An effectiveness and cost-effectiveness study	Wrong outcomes
26	De Bruin et al. (2016)	Cost-Effectiveness of Group and Internet Cognitive Behavioral Therapy for Insomnia in Adolescents: Results from a Randomized Controlled Trial	Wrong comparator
27	De Graaf et al. (2011)	One-year follow-up results of unsupported online computerized cognitive behavioural therapy for depression in primary care: A randomized trial	Wrong outcomes
28	Dear et al. (2020)	A Cost-effectiveness Analysis of an Internet-delivered Pain Management Program Delivered With Different Levels of Clinician Support: Results From a Randomised Controlled Trial	Wrong patient population
29	Delgadillo et al. (2017)	Improving the efficiency of psychological treatment using outcome feedback technology	Wrong study design
30	Dieng et al. (2013)	A randomised controlled trial of a psycho-educational intervention for melanoma survivors at high risk of developing new primary disease	Study protocol
31	Donohue et al. (2012)	12-Month cost-effectiveness of telephonedelivered collaborative care for treating post-CABG depression	Conference abstract
32	Donohue et al. (2014)	Twelve-month cost-effectiveness of telephone-delivered collaborative care for treating depression following CABG surgery: a randomized controlled trial	Wrong intervention
33	Dorstyn et al. (2012)	Effectiveness of telephone counseling in managing psychological outcomes after spinal cord injury: a preliminary study	Wrong outcomes
34	Downe-Wamboldt et al. (2007)	The effects and expense of augmenting usual cancer clinic care with telephone problem-solving counseling	Wrong outcomes
35	Drost et al. (2016)	A Web-Based Computer-Tailored Alcohol Prevention Program for Adolescents: Cost-Effectiveness and Intersectoral Costs and Benefits	Wrong outcomes

36	Duarte et al. (2014)	Computerised Cognitive Behaviour Therapy for Depression Management: A Cost-Effectiveness Analysis	Duplicate study
37	Duarte et al. (2014)	Computerised cognitive behaviour therapy for depression management: A cost-effectiveness analysis	Conference abstract
38	Dunlap et al. (2019)	Screening and Intervention for Suicide Prevention: A Cost-Effectiveness Analysis of the ED-SAFE Interventions	Wrong outcomes
39	Ebert et al. (2018)	A health economic outcome evaluation of an internet-based mobile-supported stress management intervention for employees	Wrong patient population
40	Egede et al. (2018)	Cost-Effectiveness of Behavioral Activation for Depression in Older Adult Veterans: In-Person Care Versus Telehealth	Wrong outcomes
41	El Alaoui et al. (2017)	Does internet-based cognitive behaviour therapy reduce healthcare costs and resource use in treatment of social anxiety disorder? A cost-minimisation analysis conducted alongside a randomised controlled trial	Wrong outcomes
42	Esmaeili et al. (2020)	Budget Impact Analysis of a Computer-Delivered Brief Alcohol Intervention in Veterans Affairs (VA) Liver Clinics: A Randomized Controlled Trial	Wrong outcomes
43	Everitt et al. (2019)	Therapist telephone-delivered CBT and web-based CBT compared with treatment as usual in refractory irritable bowel syndrome: the ACTIB three-arm RCT	Wrong patient population
44	Fabian et al. (2017)	Cost-effectiveness of Therapist-guided Internet-delivered Cognitive Behavior Therapy for Pediatric Obsessive-Compulsive Disorder	Duplicate study
45	Fortney et al. (2011)	A budget impact analysis of telemedicine-based collaborative care for depression	Wrong outcomes
46	Garrido et al. (2017)	Computer-assisted cognitive remediation therapy in schizophrenia: Durability of the effects and cost-utility analysis	Wrong outcomes
47	Gerhards et al. (2011)	Economic evaluation of online computerized cognitive behavioural therapy without support for depression in primary care: A randomized trial	Conference abstract
48	Gidding et al. (2018)	PsyScan e-tool to support diagnosis and management of psychological problems in general practice: a randomised controlled trial	Wrong outcomes
49	Godfrey et al. (2005)	Cost effectiveness of treatment for alcohol problems: Findings of the randomised UK alcohol treatment trial (UKATT)	Wrong intervention
50	Grafe et al. (2017)	Internet based treatment of depressive symptoms-a health economic evaluation of costs and benefits	Conference abstract
51	Gräfe et al. (2019)	Health economic evaluation of a web-based intervention for depression: the EVIDENT-trial, a randomized controlled study	Wrong outcomes
52	Gräfe et al. (2020)	Health economic evaluation of an internet intervention for depression (deprexis), a randomized controlled trial	Wrong outcomes
53	Gryczynski et al. (2021)	Computer- vs. nurse practitioner-delivered brief intervention for adolescent marijuana, alcohol, and sex risk behaviors in school-based health centers	Wrong outcomes
54	Hange et al. (2017)	The impact of internet-based cognitive behavior therapy on work ability in patients with depression - a randomized controlled study	Wrong outcomes
55	Havard et al. (2012)	Randomized Controlled Trial of Mailed Personalized Feedback for Problem Drinkers in the Emergency Department: the Short-Term Impact	Wrong intervention
56	Hedman et al. (2011)	Cost-effectiveness of Internet-based cognitive behavior therapy vs. cognitive behavioral group therapy for social anxiety disorder: results from a randomized controlled trial	Wrong outcomes

57	Hedman et al. (2013)	Cost-effectiveness and long-term effectiveness of internet-based cognitive behaviour therapy for severe health anxiety	Wrong outcomes
58	Hedman et al. (2014)	Clinical effectiveness and cost-effectiveness of Internet- vs. group-based cognitive behavior therapy for social anxiety disorder: 4-year follow-up of a randomized trial	Wrong outcomes
59	Hedman et al. (2014)	Clinical effectiveness and cost-effectiveness of Internet- vs. group-based cognitive behavior therapy for social anxiety disorder: 4-year follow-up of a randomized trial	Duplicate study
60	Hedman et al. (2016)	Cost effectiveness of internet-based cognitive behaviour therapy and behavioural stress management for severe health anxiety	Wrong outcomes
61	Hedman-Lagerlof et al. (2019)	Cost-Effectiveness and Cost-Utility of Internet-Delivered Exposure Therapy for Fibromyalgia: Results From a Randomized, Controlled Trial	Wrong patient population
62	Henderson et al. (2013)	Cost effectiveness of telehealth for patients with long term conditions (Whole Systems Demonstrator telehealth questionnaire study): nested economic evaluation in a pragmatic, cluster randomised controlled trial	Wrong patient population
63	Hollinghurst et al. (2009)	Effectiveness and Cost-Effectiveness of an Internet Based Cognitive Behavioural Psychotherapy for Depression: A Randomised Controlled Trial	Conference abstract
64	Hudson et al. (2017)	Tailored online cognitive behavioural therapy with or without therapist support calls to target psychological distress in adults receiving haemodialysis: A feasibility randomised controlled trial	Wrong study design
65	Isetta et al. (2015)	A bayesian cost-effectiveness analysis of a telemedicine-based strategy for the management of sleep apnea: A multicenter randomized controlled trial	Wrong outcomes
66	Jahoda et al. (2017)	Comparison of behavioural activation with guided self-help for treatment of depression in adults with intellectual disabilities: a randomised controlled trial	Wrong intervention
67	Jahoda et al. (2018)	Behavioural activation versus guided self-help for depression in adults with learning disabilities: the BeatIt RCT	Wrong intervention
68	Kafali et al. (2014)	Cost-effectiveness of a randomized trial to treat depression among Latinos	Wrong outcomes
69	Kaldo et al. (2008)	Internet versus group cognitive-behavioral treatment of distress associated with tinnitus: a randomized controlled trial	Wrong outcomes
70	Kamat et al. (2019)	Effect of video-assisted patient education on compliance with therapy, quality of life, psychomorbidity, and cost of illness in irritable bowel syndrome	Wrong patient population
71	Kemmeren et al. (2016)	The cost-effectiveness of blended cognitive therapy for depression, the e-compared study in the Netherlands	Study protocol
72	Kiluk et al. (2016)	Randomized Trial of Computerized Cognitive Behavioral Therapy for Alcohol Use Disorders: Efficacy as a Virtual Stand-Alone and Treatment Add-On Compared with Standard Outpatient Treatment	Wrong outcomes
73	Klein et al. (2018)	Economic Evaluation of an Internet-Based Preventive Cognitive Therapy With Minimal Therapist Support for Recurrent Depression: Randomized Controlled Trial	Wrong patient population
74	König et al. (2018)	Economic evaluation of cognitive behavioral therapy and Internet-based guided self-help for binge-eating disorder	Wrong comparator

75	Kooistra et al. (2019)	Cost and Effectiveness of Blended Versus Standard Cognitive Behavioral Therapy for Outpatients With Depression in Routine Specialized Mental Health Care: Pilot Randomized Controlled Trial	Wrong comparator
76	Kruger et al. (2014)	The cost-effectiveness of a theory-based online health behaviour intervention for new university students: an economic evaluation	Wrong patient population
77	Lalouni et al. (2018)	Clinical and Cost Effectiveness of Online Cognitive Behavioral Therapy in Children With Functional Abdominal Pain Disorders	Wrong patient population
78	Lavelle et al. (2018)	Cost-effectiveness of collaborative care for depression and PTSD in military personnel	Wrong intervention
79	Le et al. (2019)	The Cost-Effectiveness of an Internet Intervention to Facilitate Mental Health Help-Seeking by Young Adults: Randomized Controlled Trial	Wrong patient population
80	Lenhard et al. (2016)	Cost-effectiveness of internetdelivered cognitive-behavior therapy for obsessive-compulsive disorder: Results from a randomized controlled trial	Conference abstract
81	Lenhard et al. (2016)	Cost-effectiveness of internet-delivered cognitive behavior therapy for adolescent obsessive-compulsive disorder	Conference abstract
82	Lenhard et al. (2020)	Long-term outcomes of therapist-guided Internet-delivered cognitive behavior therapy for pediatric obsessive-compulsive disorder	Wrong outcomes
83	Littlewood et al. (2015)	A randomised controlled trial of computerised cognitive behaviour therapy for the treatment of depression in primary care: the Randomised Evaluation of the Effectiveness and Acceptability of Computerised Therapy (REEACT) trial	Duplicate study
84	Liu et al. (2003)	Cost-effectiveness of collaborative care for depression in a primary care veteran population	Wrong outcomes
85	Ljotsson et al. (2011)	Acceptability, effectiveness, and cost-effectiveness of internet-based exposure treatment for irritable bowel syndrome in a clinical sample: a randomized controlled trial	Wrong patient population
86	Lobban et al. (2020)	A web-based, peer-supported self-management intervention to reduce distress in relatives of people with psychosis or bipolar disorder: the REACT RCT	Wrong patient population
87	Lobban et al. (2020)	Clinical effectiveness of a web-based peer-supported self-management intervention for relatives of people with psychosis or bipolar (REACT): online, observer-blind, randomised controlled superiority trial	Wrong outcomes
88	Lokman et al. (2015)	Return-to-work intervention versus care as usual for sick listed employees with common mental disorders: Trial-based economic evaluation shows promise	Conference abstract
89	Lokman et al. (2017)	Complaint-Directed Mini-Interventions for Depressive Complaints: A Randomized Controlled Trial of Unguided Web-Based Self-Help Interventions	Wrong outcomes
90	Mayoral et al. (2017)	Economic Evaluation of a Guided and Unguided Internet-Based CBT Intervention for Major Depression: Results from a Multicentre Three-Armed Randomized Controlled Trial Conducted in Primary Care	Duplicate study
91	McCollister et al. (2016)	Cost-effectiveness analysis of a continuing care intervention for cocaine-dependent adults	Wrong outcomes
92	McCrone et al. (2004)	Cost-effectiveness of computerised cognitive-behavioural therapy for anxiety and depression in primary care: randomised controlled trial	Wrong outcomes

93	McCrone et al. (2007)	Cost-effectiveness of computer-aided behaviour therapy for obsessive-compulsive disorder	Wrong outcomes
94	Moayeri et al. (2018)	Cost-utility analysis of telephone-based cognitive behavior therapy in chronic obstructive pulmonary disease (COPD) patients with anxiety and depression comorbidities: an application for willingness to accept concept	Duplicate study
95	Moessner et al. (2014)	Cost-effectiveness of an internet-based aftercare intervention after inpatient treatment in a psychosomatic hospital	Wrong outcomes
96	Mohr et al. (2019)	A randomized noninferiority trial evaluating remotely-delivered stepped care for depression using internet cognitive behavioral therapy (CBT) and telephone CBT	Wrong comparator
97	Moradi-Lakeh et al. (2017)	Cost-effectiveness of aftercare services for people with severe mental disorders: an analysis parallel to a randomised controlled clinical trial in Iran	Wrong intervention
98	Moss-Morris et al. (2015)	A pilot randomized controlled trial of the clinical and cost effectiveness of a skype delivered group mindfulness intervention for distressed people with progressive multiple sclerosis	Conference abstract
99	Mouthaan et al. (2011)	Quality of Life and Cost-Effectiveness of a Brief Web-Based Early Intervention to Prevent PTSD in Traumatic Injury Patients	Study protocol
100	Noben et al. (2014)	Comparative cost-effectiveness of two interventions to promote work functioning by targeting mental health complaints among nurses: pragmatic cluster randomised trial	Wrong outcomes
101	Noben et al. (2015)	Comparative cost-effectiveness of two interventions to promote work functioning by targeting mental health complaints among nurses: Pragmatic cluster randomised trial	Conference abstract
102	Nordgren et al. (2014)	Effectiveness and cost-effectiveness of individually tailored Internet-delivered cognitive behavior therapy for anxiety disorders in a primary care population: a randomized controlled trial	Wrong outcomes
103	O'Connell et al. (2017)	Discrete event simulation modelling of long term cost-effectiveness of internet-based blended cognitive behavioural therapy for major depressive disorder: Extrapolation of the e-compared randomised controlled trial	Conference abstract
104	Olmstead et al. (2010)	Cost-effectiveness of computer-assisted training in cognitive-behavioral therapy as an adjunct to standard care for addiction	Wrong outcomes
105	Olmstead et al. (2019)	Cost-effectiveness of Electronic- and Clinician-Delivered Screening, Brief Intervention, and Referral to Treatment for Women in Reproductive Health Centers	Wrong outcomes
106	Osborne et al. (2019)	Cost-effectiveness of internet-based cognitive-behavioural therapy for obsessive-compulsive disorder	Wrong study design
107	Painter et al. (2015)	Cost-Effectiveness of Collaborative Care for Depression in HIV Clinics	Wrong intervention
108	Painter et al. (2017)	Cost-Effectiveness of Telemedicine-Based Collaborative Care for Posttraumatic Stress Disorder	Wrong intervention
109	Pot-Kolder et al. (2020)	Cost-Effectiveness of Virtual Reality Cognitive Behavioral Therapy for Psychosis: Health-Economic Evaluation Within a Randomized Controlled Trial	Wrong intervention

110	Pyne et al. (2010)	Cost-effectiveness analysis of a rural telemedicine collaborative care intervention for depression	Wrong intervention
111	Pyne et al. (2015)	Cost-effectiveness of on-site versus off-site collaborative care for depression in rural FQHCs	Wrong intervention
112	Richards et al. (2016)	Clinical effectiveness and cost-effectiveness of collaborative care for depression in UK primary care (CADET): a cluster randomised controlled trial	Wrong intervention
113	Rollman et al. (2012)	The 12-month cost-effectiveness of telephone delivered collaborative care for post-CABG depression	Conference abstract
114	Ruskin et al. (2004)	Treatment outcomes in depression: comparison of remote treatment through telepsychiatry to in-person treatment	Wrong outcomes
115	Salisbury et al. (2017)	An evidence-based approach to the use of telehealth in long-term health conditions: development of an intervention and evaluation through pragmatic randomised controlled trials in patients with depression or raised cardiovascular risk	Wrong intervention
116	Schotanus-Dijkstra et al. (2018)	Towards sustainable mental health promotion: trial-based health-economic evaluation of a positive psychology intervention versus usual care	Wrong outcomes
117	Schubert et al. (2015)	Cost-effectiveness Analysis of a Telephone-based Managed Care Program for Mental Disorders from the Perspective of a Statutory Health Insurance. [German]	No English
118	Sembi et al. (2015)	Mums 4 Mums: Pilot randomised controlled trial of the clinical and cost-effectiveness of telephone peer support for postnatal depression	Conference abstract
119	Shepard et al. (2016)	Telephone-based continuing care counseling in substance abuse treatment: Economic analysis of a randomized trial	Wrong outcomes
120	Simon et al. (2001)	Cost-effectiveness of systematic depression treatment for high utilizers of general medical care	Wrong intervention
121	Simon et al. (2002)	Cost-effectiveness of a program to prevent depression relapse in primary care	Wrong outcomes
122	Simon et al. (2006)	Long-term effectiveness and cost of a systematic care program for bipolar disorder	Wrong outcomes
123	Simon et al. (2009)	Incremental benefit and cost of telephone care management and telephone psychotherapy for depression in primary care	Wrong outcomes
124	Smit et al. (2006)	Cost-effectiveness of preventing depression in primary care patients - Randomised trial	Wrong outcomes
125	Smit et al. (2013)	Cost-effectiveness and cost-utility of Internet-based computer tailoring for smoking cessation	Wrong patient population
126	Solomon et al. (2015)	e-CBT (myCompass), Antidepressant Medication, and Face-to-Face Psychological Treatment for Depression in Australia: A Cost-Effectiveness Comparison	Wrong study design
127	Spindler et al. (2010)	Telehealth in the parkinson's disease subspecialty clinic: The key to the patient-centered medical home	Conference abstract
128	Thase et al. (2020)	Improving Cost-effectiveness and Access to Cognitive Behavior Therapy for Depression: Providing Remote-Ready, Computer-Assisted Psychotherapy in Times of Crisis and Beyond	Wrong comparator
129	Thiart et al. (2016)	Internet-Based Cognitive Behavioral Therapy for Insomnia: A Health Economic Evaluation	Wrong outcomes
130	Titov et al. (2009)	Shyness programme: longer term benefits, cost-effectiveness, and acceptability	Wrong outcomes
131	Valimaki et al. (2017)	Short text messages to encourage adherence to medication and follow-up for people with psychosis (mobile.net): Randomized controlled trial in Finland	Wrong outcomes

132	Van Eeden et al. (2015)	An economic evaluation of an augmented cognitive behavioural intervention vs. computerized cognitive training for post-stroke depressive symptoms	Wrong intervention
133	Van Nispen et al. (2016)	Cost-effectiveness of stepped-care implemented in low vision rehabilitation to reduce depression and anxiety in vision impaired older adults	Wrong intervention
134	Van Spijker et al. (2012)	Reducing suicidal ideation: cost-effectiveness analysis of a randomized controlled trial of unguided web-based self-help	Wrong outcomes
135	Van Spijker et al. (2016)	Online self-help for persons with suicidal intentions: budget impact analysis	Wrong study design
136	Verdonck-De Leeuw et al. (2013)	Cost-evaluation of online guided self-help targeting psychological distress in cancer survivors	Conference abstract
137	Verdonck-De Leeuw et al. (2013)	Efficacy and cost-evaluation of web-based guided self-help targeting psychological distress in cancer survivors	Conference abstract
138	Watson et al. (2018)	Cost-Effectiveness of Internet-Based Cognitive-Behavioral Treatment for Bulimia Nervosa: Results of a Randomized Controlled Trial	Wrong comparator
139	Wijnen et al. (2018)	Complaint-Directed Mini-Interventions for Depressive Symptoms: A Health Economic Evaluation of Unguided Web-Based Self-Help Interventions Based on a Randomized Controlled Trial	Wrong outcomes
140	Wright et al. (2017)	Computerised cognitive-behavioural therapy for depression in adolescents: Feasibility results and 4-month outcomes of a UK randomised controlled trial	Duplicate study
141	Zhou et al. (2019)	Efficacy and cost-effectiveness of internet-based cognitive behavioral therapy for obsessive-compulsive disorder. [Chinese]	No English

Note. Wrong outcomes can mean that no QALYs and/or costs were reported, that QALYs were reported but calculated inadequately or that included costs were not sufficient/appropriate.

C.7 Results on moderator analyses

#	Subgroups	<i>N</i>	Cochrane <i>Q</i>	<i>I</i> ²	Pooled INB	95% CI Pooled INB	<i>P</i> -value	
1	Health care perspective	15	<i>Q</i> (14)=14.2, <i>P</i> =.43	15.1% (0.0%; 64.0%)	\$280	\$109; \$451	.001	
	Societal perspective	22	<i>Q</i> (21)=22.5, <i>P</i> =.37		\$161	-\$247; \$569		.44
2	Shorter than 12-month follow-up	14	<i>Q</i> (13)=5.6, <i>P</i> =.96	0.0% (0.0%; 0.03%)	\$112	-\$194; \$418	.47	
	12-month follow-up or longer	23	<i>Q</i> (22)=30.38, <i>P</i> =.11		\$270	-\$14; \$554		.063
3	Depression	16	<i>Q</i> (15)=13.6, <i>P</i> =.55	0.0% (0.0%; 0.03%)	\$387	\$156; \$618	.001	
	Anxiety	7	<i>Q</i> (6)=1.2, <i>P</i> =.98		\$644	\$227; \$1062		.002
	Alcohol or substance abuse	5	<i>Q</i> (4)=3.6, <i>P</i> =.46		-\$129	-\$448; \$191		.43
	Depression and anxiety simultaneously	5	<i>Q</i> (4)=6.7, <i>P</i> =.15		\$580	-\$584; \$1744		.33
	obsessive compulsive disorder	2	<i>Q</i> (1)=0.2, <i>P</i> =.68		\$253	-\$544; \$1051		.53
4	Self-guided intervention	10	<i>Q</i> (9)=23.7, <i>P</i> =.005	45.2% (36.7%; 89.2%)	\$169	-\$266; \$604	.45	
	Guided intervention	27	<i>Q</i> (26)=13.1, <i>P</i> =.98		\$317	\$84; \$550		.008
5	Self-guided intervention	10	<i>Q</i> (9)=23.7, <i>P</i> =.005	45.2% (36.7%; 89.2%)	\$169	-\$266; \$604	.45	
	Less than weekly guidance	3	<i>Q</i> (2)=0.7, <i>P</i> =.71		\$108	-\$618; \$835		.77
	Weekly guidance	21	<i>Q</i> (20)=9.9, <i>P</i> =.97		\$413	\$146; \$680		.002
	More than weekly guidance	3	<i>Q</i> (2)=0.2, <i>P</i> =.90		-\$67	-\$699; \$565		.84
6	Asynchronous guidance	11	<i>Q</i> (10)=2.4, <i>P</i> =.99	0.0% (0.0%; 0.0%)	\$375	-\$229; \$979	.22	
	Synchronous guidance	11	<i>Q</i> (10)=8.1, <i>P</i> =.62		\$94	-\$335; \$524		.67
	Combination	5	<i>Q</i> (4)=1.1, <i>P</i> =.89		\$418	\$106; \$730		.009
7	Open/mass media recruitment	13	<i>Q</i> (12)=6.2, <i>P</i> =.91	6.9% (0.0%; 16.7%)	\$397	\$173; \$621	.001	
	Recruitment by clinical referral	20	<i>Q</i> (19)=23.7, <i>P</i> =.21		\$138	-\$170; \$446		.38
	Other*	4	<i>Q</i> (3)=4.4, <i>P</i> =.22		\$91	-\$1241; \$1423		.89
8	Formal diagnosis for inclusion	13	<i>Q</i> (12)=11.5, <i>P</i> =.48	0.0% (0.0%; 0.01%)	\$311	-\$192; \$814	.23	

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	Self-reported symptoms for inclusion	24	$Q(23)=25.5,$ $P=.32$	12.4% (0.0%; 58.6%)	\$235	\$38; \$432	.02
9	4-8 weeks intervention duration	18	$Q(17)=10.4,$ $P=.89$	0.0% (0.0%; 0.1%)	\$398	\$209; \$587	<.001
	9-12 weeks intervention duration	12	$Q(12)=12.9,$ $P=.30$	0.0% (0.0%; 0.02%)	\$116	\$-313; \$546	.60
	Duration more than 12 weeks	3	$Q(2)=0.9,$ $P=.65$	0.0% (0.0%; 0.01%)	\$-107	\$-979; \$765	.81
	Undefined intervention duration	4	$Q(3)=6.6,$ $P=.09$	25.6% (0.0%; 77.4%)	\$-244	\$-960; \$471	.50
10	Care-as-usual control condition	32	$Q(31)=33.7,$ $P=.34$	7.9% (0.0%; 46.1%)	\$261	\$77; \$445	.005
	Attention control condition	5	$Q(4)=3.0,$ $P=.55$	0.0% (0.0%; 0.01%)	\$64	\$-617; \$745	.85

CI=confidence interval; INB=incremental net benefit.

Studies falling under this category used either both open recruitment and clinical referral or screened a specific population.

C.8 Results on sensitivity analyses

#	Subgroups	<i>N</i>	Cochrane <i>Q</i>	<i>I</i> ²	Pooled INB	95% CI Pooled INB	<i>P</i> -value
1	High CHEC list quality rating	24	<i>Q</i> (23)=18.6, <i>P</i> =.72	0.8% (0.0%; 7.6%)	\$253	\$43; \$463	.018
	Low CHEC list quality rating	13	<i>Q</i> (12)=18.5, <i>P</i> =.10	26.0% (0.0%; 77.8%)	\$197	-\$155; \$548	.27
2	Low risk of bias rating	8	<i>Q</i> (7)=3.4, <i>P</i> =.84	0.0% (0.0%; 0.01%)	\$244	-\$555; \$1042	.55
	Medium risk of bias rating	8	<i>Q</i> (7)=13.0, <i>P</i> =.072	0.0% (0.0%; 0.01%)	\$374	-\$284; \$1031	.27
	High risk of bias rating	21	<i>Q</i> (20)=20.1, <i>P</i> =.45	9.3% (0.0%; 50.8%)	\$287	\$113; \$461	.001
3	QALY valued at \$20,000	37	<i>Q</i> (36)=36.1, <i>P</i> =.46	5.3% (0.0%; 35.6%)	\$145	\$56 \$234	.001
4	QALY valued at \$80,000	37	<i>Q</i> (36)=40.0, <i>P</i> =.30	12.9% (0.0%; 59.6%)	\$431	\$115; \$747	.008
5	Only studies with directly calculated covariances	12	<i>Q</i> (11)=6.98, <i>P</i> =.80	0.0% (0.0%; 0.02%)	\$264	-\$167; \$694	.23
	Studies with indirectly calculated covariances	25	<i>Q</i> (24)=30.1, <i>P</i> =.18	14.0% (0.0%; 61.8%)	\$236	\$27; \$445	.03

CI=confidence interval; INB=incremental net benefit.

Chapter D

Supplemental Material for Chapter 5

D.1 List of all predetermined construct validity hypotheses

Construct validity hypotheses

For all hypotheses we expected a significant medium to high correlation ($0.3 < r < 0.7$) in the direction explained in the article text.

- H1: ICECAP-A capability values and the EQ-5D utility scores;
- H2: ICECAP-A stability subscale and EQ-5D anxiety/depression subscale;
- H3: ICECAP-A attachment subscale and EQ-5D anxiety/depression subscale;
- H4: ICECAP-A autonomy subscale and EQ-5D anxiety/depression subscale;
- H5: ICECAP-A achievement subscale and EQ-5D anxiety/depression subscale;
- H6: ICECAP-A enjoyment subscale and EQ-5D anxiety/depression subscale;
- H7: ICECAP-A autonomy subscale and EQ-5D mobility subscale;
- H8: ICECAP-A autonomy subscale and EQ-5D self-care subscale;
- H9: ICECAP-A autonomy subscale and EQ-5D usual activities subscale;
- H10: ICECAP-A achievement subscale and EQ-5D usual activities subscale;
- H11: ICECAP-A achievement subscale and EQ-5D pain subscale;
- H12: ICECAP-A enjoyment subscale and EQ-5D usual activities subscale;
- H13: ICECAP-A enjoyment subscale and EQ-5D pain subscale.

A hypothesis was added later (not preregistered) to improve the interpretability of the ICECAP-A measurement properties. A strong correlation was expected between the ICECAP-A capability values and a 3-item measure of self-efficacy.

- H14: ICECAP-A capability values and self-efficacy.

Known-group hypotheses

For a hypothesis to be confirmed the differences need to be both statistically significant and greater than the SEM. The SEM can be derived from the error variance of an analysis of variance for repeated measures, including systematic differences: $SEM = \sqrt{\sigma_{time}^2 + \sigma_{error}^2}$. Note that hypotheses 19-22 were added later (not preregistered).

- H16: Higher ICECAP-A scores for participants who indicated to be very happy or moderately happy as opposed to participants who indicated to be not very happy or unhappy;
- H17: Higher ICECAP-A scores for participants who indicated to be closer to the best health they could imagine as indicated by the visual analogue scale of the EQ-5D (score between 66 and 100) as opposed to participants indicating being further away from the best health they could imagine (score between 0 and 65). The cutoff score on the visual analogue scale of the EQ-5D for this hypothesis was based on the average and standard deviation of general populations in earlier research, which mostly had a mean of around 80 and standard deviation of around 15 (on a scale of 0 to 100);
- H18: Higher ICECAP-A scores for participants who indicated to have a long-lasting illness as opposed to participants who indicated not to have one;
- H19: Lower ICECAP-A scores for participants who indicated that the long-lasting illness (as reported in H16) obstructed daily life as opposed to participants who indicated that this was not the case;
- H20: Lower ICECAP-A scores for participants who indicated to have been to the hospital in the last three months to visit a doctor as opposed to participants who have not been to the hospital in this period;
- H21: Lower ICECAP-A scores for participants who indicated to have had to stay (spend at least one night) in the hospital in the last three months as opposed to participants for whom this was not the case;
- H22: Lower ICECAP-A scores for participants who indicated to have had at least one visit to the general practitioner in the last three months as opposed to participants for whom this was not the case;
- H23: Higher ICECAP-A scores for people who indicated more self-efficacy in their lives. Self-reported efficacy was assessed with three questions on a 4-point scale (1=often, 2=sometimes, 3=rarely, 4=never) regarding the feeling that one's life is full with possibilities, the feeling to have no control over one's life, and the feeling that one can do the things one wants to do. After recoding the second question, lower scores reflected higher self-reported efficacy. The compared groups were participants who indicated 'often' or 'sometimes' on all three questions versus all other participants;
- H24: Lower ICECAP-A scores for participants who indicated to be unemployed or have an occupational disability as opposed to all other participants;

- H25: Higher ICECAP-A scores for participants who indicated to be in a relationship as opposed to participants who indicated to fall under the category single, divorced, widow or other;
- H26: Higher ICECAP-A scores for participants who indicated to have enjoyed higher education. Three groups were made based on previous research with the EQ-5D [1], being primary and/or lower education, secondary and/or vocational education and higher and/or college education.

References

[1] Janssen, M. F., Pickard, A. S., Golicky, D., Gudex, C., Niewada, M., Scalone, L., Swinburn, P., & Busschbach, J. (2012). Measurement properties of the EQ-5D-5L compared to the EQ-5D-3L across eight patient groups: a multi-country study. *Quality of Life Research*, 22(7), 1717-1727. <https://doi.org/10.1007/s11136-012-0322-4>

D.2 Comparison of sample with Dutch population on target variables

Variable	Category	Construct validity sample (T1; N = 941)	Test-retest sample (T2; N = 208)	Dutch population ^a
Age groups	18-24	9.4%	5.8%	11.0%
	25-34	15.0%	9.1%	16.0%
	35-44	14.5%	7.7%	15.0%
	45-54	18.4%	15.9%	18.0%
	55-64	17.6%	21.2%	17.0%
	65-74	20.4%	32.7%	14.0%
	75-99	4.8%	7.7%	10.0%
Gender	Female	51.4%	45.7%	49.11%
	Male	48.4%	54.3%	50.89%
	Other	0.2%	0.0%	Unknown
Region	Groningen	3.5%	5.3%	3.0%
	Friesland	3.4%	5.3%	4.0%
	Drenthe	3.1%	5.8%	3.0%
	Overijssel	8.4%	6.3%	7.0%
	Gelderland	11.6%	11.1%	12.0%
	Flevoland	2.2%	4.8%	2.0%
	Utrecht	8.6%	7.7%	7.0%
	Noord-Holland	16.7%	12.0%	16.0%
	Zuid-Holland	18.5%	16.3%	21.0%
	Zeeland	2.2%	3.4%	2.0%
	Noord-Brabant	14.0%	14.9%	15.0%
Limburg	7.8%	7.2%	7.0%	
Income	<€11.500	5.4%	3.4%	5.0%
	€11.500–€30.000	28.6%	34.6%	26.0%
	€30.000–€36.000	10.4%	11.1%	9.0%
	€36.000–€60.500	31.0%	25.0%	33.0%
	>€60.500	20.7%	22.6%	27.0%
	Rather not tell	3.8%	3.4%	Not applicable
Education	High	37.5%	38.5%	34.2% ^b
	Middle	42.0%	36.5%	37.8% ^b
	Low	20.4%	25.0%	26.3% ^b
	Missing/Unknown	0.1%	0.0%	1.6% ^b

^a Numbers are based on the latest numbers known to the market research agency unless indicated otherwise.

^b Numbers are based on 2020 education statistics of the Netherlands' Central Bureau of Statistics.

Note. The selection of a sample representative of the Dutch population was based on the age, gender, region and income variables. Other variables such as education, religion and ethnicity were not considered.

D.3 Individual item details of the ICECAP-A and EQ-5D-5L

Gwet's AC2 [1] was preferred over the intraclass correlation coefficient as test-retest reliability parameter for the individual items of the ICECAP-A and EQ-5D-5L as it is appropriate for ordinal outcomes and skewed data [2, 3]. A Gwet's AC2 of 0.4 – 0.6, 0.6 – 0.8 and greater than 0.8 was considered as moderate, good and excellent reliability respectively.

D3.1 ICECAP-A individual item frequencies (%) and reliability for the study sample

Capability	Level 1 ^a	Level 2 ^a	Level 3 ^a	Level 4 ^a	Mean (SD) ^a	Gwet's AC2 [95% CI] ^b	Level of agreement ^b
Stability	12 (1.3)	108 (11.5)	425 (45.2)	396 (42.1)	3.3 (0.7)	0.64 [0.54; 0.73]	70.7%
Attachment	8 (0.9)	144 (15.3)	382 (40.6)	407 (43.3)	3.3 (0.7)	0.59 [0.49; 0.69]	67.3%
Autonomy	16 (1.7)	79 (8.4)	395 (42.0)	451 (47.9)	3.4 (0.7)	0.62 [0.52; 0.71]	68.8%
Achievement	31 (3.3)	191 (20.3)	456 (48.5)	263 (27.9)	3.0 (0.8)	0.51 [0.39; 0.62]	61.1%
Enjoyment	16 (1.7)	148 (15.7)	422 (44.8)	355 (37.7)	3.2 (0.8)	0.58 [0.48; 0.69]	66.8%

Note. Values represent frequencies with percentages in parentheses unless indicated otherwise. Level 1 corresponds to 'not being able to experience a capability at all' and level 4 to 'being able to fully experience a capability'.

SD = Standard deviation.

^a Values are based on the total study sample ($N = 941$)

^b Values are based on the test-retest sample ($N = 208$)

References

- [1] Gwet, K. L. (2008). Computing inter-rater reliability and its variance in the presence of high agreement. *British Journal of Mathematical and Statistical Psychology*, 61(Pt 1), 29–48. <https://doi.org/10.1348/000711006X126600>
- [2] Tran, D., Dolgun, A., & Demirhan, H. (2020). Weighted inter-rater agreement measures for ordinal outcomes. *Communications in Statistics-Simulation and Computation*, 49(4), 989–1003. <https://doi.org/10.1080/03610918.2018.1490428>
- [3] Long, D., Polinder, S., Bonsel, G. J., & Haagsma, J. A. (2021). Test-retest reliability of the EQ-5D-5L and the reworded QOLIBRI-OS in the general population of Italy, the Netherlands, and the United Kingdom. *Quality of Life Research*, 1-11. <https://doi.org/10.1007/s11136-021-02893-3>

D3.2 EQ-5D-5L individual item frequencies (%) and reliability for the study sample

Capability	Level 1 ^a	Level 2 ^a	Level 3 ^a	Level 4 ^a	Level 5 ^a	Mean (SD) ^a	Gwet's AC2 [95% CI] ^b	Level of agreement ^b
Mobility	7 (0.7)	33 (3.5)	66 (7.0)	180 (19.1)	655 (69.6)	4.5 (0.8)	0.75 [0.68; 0.83]	78.4%
Self-care	9 (1.0)	4 (0.4)	18 (1.9)	58 (6.2)	852 (90.5)	4.9 (0.6)	0.92 [0.87; 0.96]	91.8%
Usual activities	12 (1.3)	30 (3.2)	94 (10.0)	201 (21.4)	604 (64.2)	4.4 (0.9)	0.78 [0.71; 0.84]	80.3%
Pain/discomfort	8 (0.9)	50 (5.3)	131 (13.9)	325 (34.5)	427 (45.4)	4.2 (0.9)	0.59 [0.5; 0.69]	65.9%
Anxiety/depression	7 (0.7)	28 (3.0)	81 (8.6)	196 (20.8)	629 (66.8)	4.5 (0.8)	0.74 [0.66; 0.81]	76.4%

Note. Values represent frequencies with percentages in parentheses unless indicated otherwise. Level 1 corresponds to 'extreme problems/unable to' and level 5 to 'no problems'.

SD = Standard deviation.

^a Values are based on the total study sample ($N = 941$)

^b Values are based on the test-retest sample ($N = 208$)

D.4 Correlation matrix of ICECAP-A and EQ-5D-5L index scores and subscales

	EQ-5D index score	Mobility	Self-care	Usual activities	Pain/discomfort	Anxiety/depression	Visual analogue scale
ICECAP capability score	0.60 ^a	0.29	0.28	0.50	0.41	0.57	0.58
Stability	0.44	0.13	0.15	0.32	0.30	0.50 ^a	0.41
Attachment	0.33	0.11	0.15	0.23	0.16	0.44 ^a	0.36
Autonomy	0.45	0.25 ^a	0.27 ^a	0.44 ^a	0.32	0.33 ^a	0.42
Achievement	0.53	0.33	0.26	0.48 ^a	0.41 ^a	0.38 ^a	0.51
Enjoyment	0.47	0.24	0.18	0.37 ^a	0.34 ^a	0.49 ^a	0.46

Note. All presented correlations are significant with p -value < .001.

^a Correlation for which predetermined hypotheses were composed.

D.5 Results on hypotheses for known-group differences repeated for the EQ-5D-5L

Hypothesis	Known group	<i>N</i>	Mean rank score	Median	Range	<i>p</i> -value	Confirmed
H16	Happy	800	512	0.9340	−0.4; 1.0	< .001	Yes
	Unhappy	141	236	0.7540	−0.1; 1.0		
H17	VAS ≥ 65	714	558	0.9340	0.0; 1.0	< .001	Yes
	VAS < 65	227	197	0.7260	−0.4; 1.0		
H18	No illness	562	601	0.9650	0.3; 1.0	< .001	Yes
	Illness present	379	278	0.7900	−0.4; 1.0		
H19a	Non-obstructing illness	51	281	0.9340	0.3; 1.0	< .001	Yes
	Obstructing illness	328	176	0.7680	−0.4; 1.0		
H20	No hospital visit	588	542	0.9340	−0.1; 1.0	< .001	Yes
	Hospital visit	353	352	0.8340	−0.4; 1.0		
H21	No hospital stay	860	485	0.9300	−0.4; 1.0	< .001	Yes
	Hospital stay	81	319	0.8250	0.1; 1.0		
H22	No GP visit	383	582	0.9650	0.0; 1.0	< .001	Yes
	GP visit	558	395	0.8640	−0.4; 1.0		
H23	High self-efficacy	415	583	0.9610	0.2; 1.0	< .001	Yes
	Low self-efficacy	526	382	0.8640	−0.4; 1.0		
H24	Employed	811	504	0.9340	−0.4; 1.0	< .001	Yes
	Unemployed/ occupational disability	130	265	0.7640	0.0; 1.0		
H25	Relationship	640	486	0.9300	0.0; 1.0	= .011	Yes
	No relationship	301	439	0.8950	−0.4; 1.0		
H26b	Higher education	353	NA	0.9340	0.1; 1.0	= .002	No
	Medium education	395		0.9300	−0.1; 1.0		
	Lower education	192		0.8750	−0.4; 1.0		

The standard error of measurement (SEM) of the EQ-5D-5L was calculated to be .0133.

GP general practitioner; VAS visual analogue scale of the EQ-5D-5L

^a This question was only applicable to 379 participants who indicated to have a chronic illness

^b One subject is missing from this analysis since the response to this question was not interpretable

Chapter E

Supplemental Material for Chapter 6

E.1 Orthogonal Main Effects Plan (OMEPE) design for the best-worst scaling task

Regular OMEPE design						Foldover OMEPE design					
Profile	Sta	Att	Aut	Ach	Enj	Profile	Sta	Att	Aut	Ach	Enj
1	2	1	1	2	3	1	3	4	4	3	2
2	1	1	4	3	4	2	4	4	1	2	1
3	4	3	4	2	2	3	1	2	1	3	3
4	1	4	1	4	2	4	4	1	4	1	3
5	1	3	3	1	3	5	4	2	2	4	2
6	4	1	3	4	1	6	1	4	2	1	4
7	2	4	4	1	1	7	3	1	1	4	4
8	3	1	2	1	2	8	2	4	3	4	3
9	1	2	2	2	1	9	4	3	3	3	4
10	2	3	2	4	4	10	3	2	3	1	1
11	3	4	3	2	4	11	2	1	2	3	1
12	3	3	1	3	1	12	2	2	4	2	4
13	2	2	3	3	2	13	3	3	2	2	3
14	4	4	2	3	3	14	1	1	3	2	2
15	3	2	4	4	3	15	2	3	1	1	2
16	4	2	1	1	4	16	1	3	4	4	1

Note. This table shows the levels (ranging from [1] to [4]) on which the corresponding attribute was presented in each of the 16 profiles in the original OMEPE design and its foldover.
 Sta=Stability, Att=Attachment, Aut=Autonomy, Ach=Achievement, Enj=Enjoyment.

E.2 Demographics, health and ICECAP-A questionnaires

Demographics

Extracted information on demographics was. . .

1. Age in years;
2. Current living region or province;
3. Gender;
4. Highest completed education level with nine categories (ranging from 'no education' to 'university') that were later transformed to lower, middle and high education;
5. Employment status with eight categories ranging from 'unemployed' to 'retired';
6. Marital status;
7. Household composition.

Health

Extracted information on health was. . .

1. General happiness on a 4-point scale;
2. General health on a 5-point scale;
3. Chronic illness (yes/no);
4. Whether this illness obstructs daily life in any way (yes/no);
5. The amount of visits to a general practitioner or other doctor;
6. If there were any hospital visits in the last 3 months (yes/no);
7. If there were any hospital stays in the last 3 months (yes/no).

ICECAP-A

The ICECAP-A (Al-Janabi, Flynn & Coast, 2012) measures five capabilities for different aspects of life on a 4-point scale: 1) stability – the extent to which someone can feel settled and secure; 2) attachment – the extent to which someone can feel love, friendship and support; 3) autonomy – the extent to which someone can feel independent; 4) achievement – the extent to which someone can experience achievement and success; 5) enjoyment – the extent to which someone can experience enjoyment and pleasure. Each of the capabilities is presented with four distinct levels (i.e., ranging from [1] not being able to experience a capability at all to [4] being able to fully experience a capability). The five capabilities assess the extent to which someone experiences the freedom to be or carry out what one wishes. Afentou and Kinghorn (2020) have systematically reviewed the literature for studies exploring the psychometric properties of the ICECAP-A. The studies suggest adequate content and construct validity.

References

Al-Janabi H, Flynn TN, Coast J. Development of a self-report measure of capability wellbeing for adults: the ICECAP-A. *Qual Life Res.* 2012;21(1):167-176.

Afentou N, Kinghorn P. A systematic review of the feasibility and psychometric properties of the ICEpop CAPability Measure for Adults and its use so far in economic evaluation. *Value Health.* 2020;23(4):515-526.



E.3 Best-worst scaling task and accompanying explanations

Participants were randomly assigned; half of the sample to version 1 (OMEF design) and half of the sample to version 2 (OMEF design foldover)

<<Instructions>>

In the next section 16 quality of life situations will be presented to you. The situations will be described based on the five components of quality of life from the previous question. From the five statements you have to choose which statement you find the best (would contribute the most to a valuable life) and which statement you find the worst (would obstruct a valuable life the most).

Here is an example that someone has filled out:

	Best 	Worst 
I am able to feel settled and secure in a few areas of my life [2]	<input type="radio"/>	<input type="radio"/>
I can have quite a lot of love, friendship and support [3]	<input type="radio"/>	<input type="radio"/>
I am able to be completely independent [4]	<input checked="" type="radio"/>	<input type="radio"/>
I can achieve and progress in all aspects of my life [4]	<input type="radio"/>	<input type="radio"/>
I cannot have any enjoyment and pleasure [1]	<input type="radio"/>	<input checked="" type="radio"/>

Just like the previous questions, the number at the end of each statement indicates the level of the statement on a scale of 1 to 4.

Of the above statements this person found ‘completely being independent’ the best. According to this person, this statement contributes the most to a valuable life, in comparison to the other statements. ‘Cannot have any enjoyment and pleasure’ has been chosen as worst statement by this person. This statement obstructs a valuable life the most according to this person.

Please read the following statements carefully. Which of the statements do you choose to be the best and which to be the worst? In other words, which statement contributes the most to a valuable life (best) and which statement obstructs having a valuable life the most (worst) according to you?

VERSION 1 (OMEP design)

<<Above each scenario>>

Which statement contributes the most to a valuable life (best) and which the least (worst)?

Scenario 1

I am able to feel settled and secure in a few areas of my life [2]

I cannot have any love, friendship and support [1]

I am unable to be at all independent [1]

I can achieve and progress in a few aspects of my life [2]

I can have quite a lot of enjoyment and pleasure [3]

Scenario 2

I am unable to feel settled and secure in any areas of my life [1]

I cannot have any love, friendship and support [1]

I am able to be completely independent [4]

I can achieve and progress in many aspects of my life [3]

I can have a lot of enjoyment and pleasure [4]

Scenario 3

I am able to feel settled and secure in all areas of my life [4]

I can have quite a lot of love, friendship and support [3]

I am able to be completely independent [4]

I can achieve and progress in a few aspects of my life [2]

I can have a little enjoyment and pleasure [2]

Scenario 4

I am unable to feel settled and secure in any areas of my life [1]

I can have a lot of love, friendship and support [4]

I am unable to be at all independent [1]

I can achieve and progress in all aspects of my life [4]

I can have a little enjoyment and pleasure [2]

Scenario 5

I am unable to feel settled and secure in any areas of my life [1]

I can have quite a lot of love, friendship and support [3]

I am able to be independent in many things [3]

I cannot achieve and progress in any aspects of my life [1]

I can have quite a lot of enjoyment and pleasure [3]

Scenario 6

I am able to feel settled and secure in all areas of my life [4]
I cannot have any love, friendship and support [1]
I am able to be independent in many things [3]
I can achieve and progress in all aspects of my life [4]
I cannot have any enjoyment and pleasure [1]

Scenario 7

I am able to feel settled and secure in a few areas of my life [2]
I can have a lot of love, friendship and support [4]
I am able to be completely independent [4]
I cannot achieve and progress in any aspects of my life [1]
I cannot have any enjoyment and pleasure [1]

Scenario 8

I am able to feel settled and secure in many areas of my life [3]
I cannot have any love, friendship and support [1]
I am able to be independent in a few things [2]
I cannot achieve and progress in any aspects of my life [1]
I can have a little enjoyment and pleasure [2]

Scenario 9

I am unable to feel settled and secure in any areas of my life [1]
I can have a little love, friendship and support [2]
I am able to be independent in a few things [2]
I can achieve and progress in a few aspects of my life [2]
I cannot have any enjoyment and pleasure [1]

Scenario 10

I am able to feel settled and secure in a few areas of my life [2]
I can have quite a lot of love, friendship and support [3]
I am able to be independent in a few things [2]
I can achieve and progress in all aspects of my life [4]
I can have a lot of enjoyment and pleasure [4]

Scenario 11

I am able to feel settled and secure in many areas of my life [3]
I can have a lot of love, friendship and support [4]
I am able to be independent in many things [3]
I can achieve and progress in a few aspects of my life [2]
I can have a lot of enjoyment and pleasure [4]

Scenario 12

I am able to feel settled and secure in many areas of my life [3]
I can have quite a lot of love, friendship and support [3]

I am unable to be at all independent [1]
I can achieve and progress in many aspects of my life [3]
I cannot have any enjoyment and pleasure [1]

Scenario 13

I am able to feel settled and secure in a few areas of my life [2]
I can have a little love, friendship and support [2]
I am able to be independent in many things [3]
I can achieve and progress in many aspects of my life [3]
I can have a little enjoyment and pleasure [2]

Scenario 14

I am able to feel settled and secure in all areas of my life [4]
I can have a lot of love, friendship and support [4]
I am able to be independent in a few things [2]
I can achieve and progress in many aspects of my life [3]
I can have quite a lot of enjoyment and pleasure [3]

Scenario 15

I am able to feel settled and secure in many areas of my life [3]
I can have a little love, friendship and support [2]
I am able to be completely independent [4]
I can achieve and progress in all aspects of my life [4]
I can have quite a lot of enjoyment and pleasure [3]

Scenario 16

I am able to feel settled and secure in all areas of my life [4]
I can have a little love, friendship and support [2]
I am unable to be at all independent [1]
I cannot achieve and progress in any aspects of my life [1]
I can have a lot of enjoyment and pleasure [4]

VERSION 2 (OMEP design foldover)

<<Above each scenario>>

Which statement contributes the most to a valuable life (best) and which the least (worst)?

Scenario 1

I am able to feel settled and secure in many areas of my life [3]
I can have a lot of love, friendship and support [4]
I am able to be completely independent [4]
I can achieve and progress in many aspects of my life [3]
I can have a little enjoyment and pleasure [2]

Scenario 2

I am able to feel settled and secure in all areas of my life [4]
I can have a lot of love, friendship and support [4]
I am unable to be at all independent [1]
I can achieve and progress in a few aspects of my life [2]
I cannot have any enjoyment and pleasure [1]

Scenario 3

I am unable to feel settled and secure in any areas of my life [1]
I can have a little love, friendship and support [2]
I am unable to be at all independent [1]
I can achieve and progress in many aspects of my life [3]
I can have quite a lot of enjoyment and pleasure [3]

Scenario 4

I am able to feel settled and secure in all areas of my life [4]
I cannot have any love, friendship and support [1]
I am able to be completely independent [4]
I cannot achieve and progress in any aspects of my life [1]
I can have quite a lot of enjoyment and pleasure [3]

Scenario 5

I am able to feel settled and secure in all areas of my life [4]
I can have a little love, friendship and support [2]
I am able to be independent in a few things [2]
I can achieve and progress in all aspects of my life [4]
I can have a little enjoyment and pleasure [2]

Scenario 6

I am unable to feel settled and secure in any areas of my life [1]
I can have a lot of love, friendship and support [4]
I am able to be independent in a few things [2]
I cannot achieve and progress in any aspects of my life [1]
I can have a lot of enjoyment and pleasure [4]

Scenario 7

I am able to feel settled and secure in many areas of my life [3]
I cannot have any love, friendship and support [1]
I am unable to be at all independent [1]
I can achieve and progress in all aspects of my life [4]
I can have a lot of enjoyment and pleasure [4]

Scenario 8

I am able to feel settled and secure in a few areas of my life [2]
I can have a lot of love, friendship and support [4]
I am able to be independent in many things [3]

I can achieve and progress in all aspects of my life [4]
I can have quite a lot of enjoyment and pleasure [3]

Scenario 9

I am able to feel settled and secure in all areas of my life [4]
I can have quite a lot of love, friendship and support [3]
I am able to be independent in many things [3]
I can achieve and progress in many aspects of my life [3]
I can have a lot of enjoyment and pleasure [4]

Scenario 10

I am able to feel settled and secure in many areas of my life [3]
I can have a little love, friendship and support [2]
I am able to be independent in many things [3]
I cannot achieve and progress in any aspects of my life [1]
I cannot have any enjoyment and pleasure [1]

Scenario 11

I am able to feel settled and secure in a few areas of my life [2]
I cannot have any love, friendship and support [1]
I am able to be independent in a few things [2]
I can achieve and progress in many aspects of my life [3]
I cannot have any enjoyment and pleasure [1]

Scenario 12

I am able to feel settled and secure in a few areas of my life [2]
I can have a little love, friendship and support [2]
I am able to be completely independent [4]
I can achieve and progress in a few aspects of my life [2]
I can have a lot of enjoyment and pleasure [4]

Scenario 13

I am able to feel settled and secure in many areas of my life [3]
I can have quite a lot of love, friendship and support [3]
I am able to be independent in a few things [2]
I can achieve and progress in a few aspects of my life [2]
I can have quite a lot of enjoyment and pleasure [3]

Scenario 14

I am unable to feel settled and secure in any areas of my life [1]
I cannot have any love, friendship and support [1]
I am able to be independent in many things [3]
I can achieve and progress in a few aspects of my life [2]
I can have a little enjoyment and pleasure [2]

Scenario 15

I am able to feel settled and secure in a few areas of my life [2]

I can have quite a lot of love, friendship and support [3]

I am unable to be at all independent [1]

I cannot achieve and progress in any aspects of my life [1]

I can have a little enjoyment and pleasure [2]

Scenario 16

I am unable to feel settled and secure in any areas of my life [1]

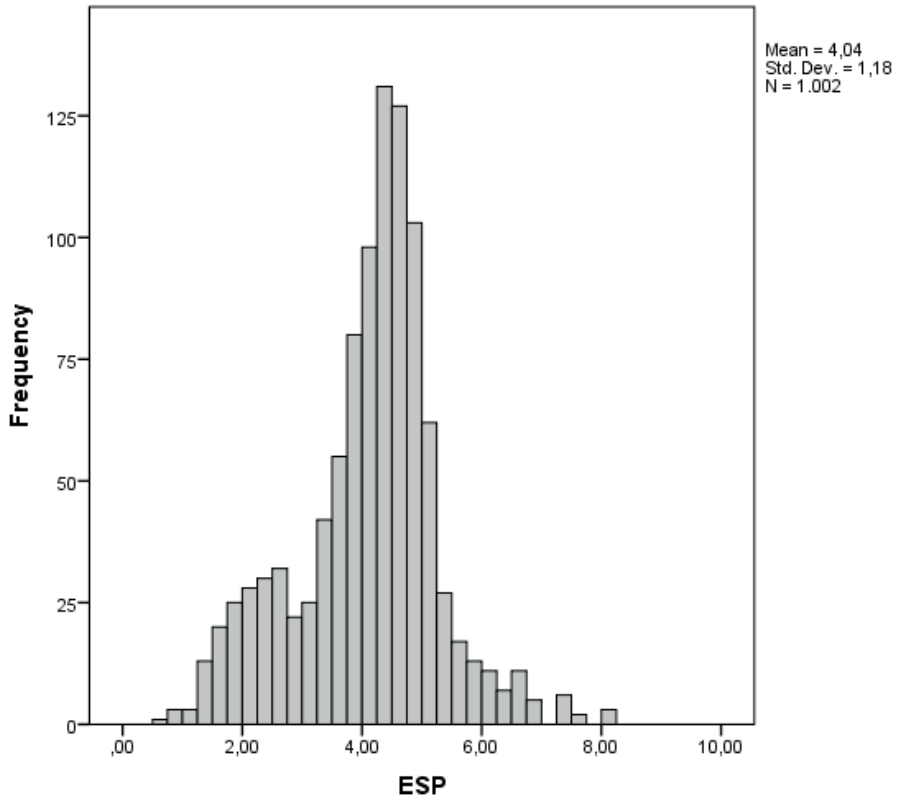
I can have quite a lot of love, friendship and support [3]

I am able to be completely independent [4]

I can achieve and progress in all aspects of my life [4]

I cannot have any enjoyment and pleasure [1]

E.4 Distribution of the Empirical Scale Parameter (ESP)



E.5 Comparison of sample with Dutch population on target variables

Variable	Category	Full sample (<i>N</i> = 1002)	Analyzed (<i>N</i> = 933)	Dutch population ^a
Age groups	18-24	10.6%	10.2%	11.0%
	25-34	15.8%	15.1%	16.0%
	35-44	14.9%	14.9%	15.0%
	45-54	18.4%	18.6%	18.0%
	55-64	16.8%	16.9%	17.0%
	65-74	19.2%	19.6%	14.0%
	75-99	4.5%	4.6%	10.0%
Gender	Female	50.8%	51.3%	49.11%
	Male	49.0%	48.6%	50.89%
	Other	0.2%	0.1%	Unknown
Region	Groningen	3.4%	3.5%	3.0%
	Friesland	3.4%	3.2%	4.0%
	Drenthe	3.3%	3.3%	3.0%
	Overijssel	8.3%	8.6%	7.0%
	Gelderland	11.5%	11.7%	12.0%
	Flevoland	2.3%	2.3%	2.0%
	Utrecht	8.6%	8.6%	7.0%
	Noord-Holland	16.8%	16.7%	16.0%
	Zuid-Holland	18.9%	19.3%	21.0%
	Zeeland	2.2%	2.0%	2.0%
	Noord-Brabant	16.8%	13.3%	15.0%
Limburg	7.7%	7.5%	7.0%	
Income	<€11.500	5.5%	4.8%	5.0%
	€11.500–€30.000	28.2%	28.9%	26.0%
	€30.000–€36.000	10.6%	10.1%	9.0%
	€36.000–€60.500	30.6%	30.9%	33.0%
	>€60.500	21.1%	21.3%	27.0%
	Rather not tell	4.0%	4.0%	Not applicable
Education	High	37.1%	37.6%	34.2% ^b
	Middle	41.7%	42.2%	37.8% ^b
	Low	20.5%	19.5%	26.3% ^b
	Missing/Unknown	0.7%	0.6%	1.6% ^b

^a Numbers are based on the latest numbers known to the market research agency unless indicated otherwise.

^b Numbers are based on 2020 education statistics of the Netherlands' Central Bureau of Statistics.

Note. The selection of a sample representative of the Dutch population was based on the age, gender, region and income variables. Other variables such as education, religion and ethnicity were not considered.

E.6 Data quality and exclusion of participants

Excluding individuals from preference studies is not recommended and might lead to selection bias (Lancsar and Louviere, 2006), as it is often unclear whether preference choices are indeed irrational. However, since the best-worst scaling task was conducted anonymous and online and participants received a small monetary sum, some might abuse the assessment. The empirical scale parameter (ESP) is a good tool for detecting such 'gamers'. Indeed, people with an ESP two standard deviations above the average ($n=29$) showed highly suspicious answering patterns (e.g., always choosing a certain capability as best and another as worst, regardless of the level on which they were presented) and had a significantly lower survey completion time ($M = 9.1$ minutes) compared to the analyzed sample ($M = 14.2$ minutes). Visual inspection of answers from participants with an ESP of two standard deviations below the average ($N = 40$) also revealed unlikely best-worst pairs, suggesting that the task was not understood correctly or taken seriously. Additionally, these participants had a completion time ($M = 9.4$ minutes) that was very similar to participants with a high ESP. Taken together, participants with both an unusually high and low ESP seemed to share characteristics that jeopardized the quality of the research, validating the choice of excluding these participants. Importantly, excluding these participants did not influence the representativeness of the sample (see E.5) or the balance of randomization to the two versions of the best-worst scaling task.

To further explore the impact of exclusion on the quality of the data, best-worst pairs tables were made for different subgroups of the total sample. This made it possible to compare survey completion times and the frequency of unlikely best and worst scores. Table E6.1 lists the findings. We infer from this table that excluding participants with a deviating ESP results in a small improvement in data quality while still retaining a large sample representative of the Dutch population.

References

Lancsar, E., & Louviere, J. (2006). Deleting 'irrational' responses from discrete choice experiments: a case of investigating or imposing preferences? *Health economics*, *15*(8), 797-811.

E6.1 Results on unlikely choices and survey completion time for different sample subgroups

Exclusion criterion	<i>N</i> included	<i>N</i> excluded	Worst choice capability at level 4 in % ^a	Best choice capability at level 1 in % ^b	Survey completion time of excluded participants (<i>SD</i>)
None	1002	0	13.01	6.12	NA
Two SD below or above average ESP	933	69	12.33	5.25	9.3 (6.9)
Two SD below average ESP	962	40	12.72	5.41	9.4 (8.5)
Two SD above average ESP	973	29	12.65	5.99	9.1 (3.9)
Less than 5 minutes completion time	941	61	12.53	5.38	4.4 (0.4)
Two SD below or above average ESP OR less than 5 minutes completion time	881	121	11.87	4.57	7.2 (5.7)

ESP=Emperical scale parameter, SD=Standard deviation

^a The relative frequency of participants choosing a capability presented at level 4 as worst.

^b The relative frequency of participants choosing a capability presented at level 1 as best.

E.7 Summary statistics for all estimated SALC models

Preference classes	Scale classes	Worst choice as scale predictor	LL	BIC (LL)	Npar	L^2	Df	p -value	R^2
1-class	-	-	-37922	75973	19	64376	914	< .001	0.14
2-class	-	-	-35450	71166	39	59433	894	< .001	0.19
3-class	-	-	-34736	69876	59	58005	874	< .001	0.23
4-class	-	-	-34342	69224	79	57216	854	< .001	0.25
5-class	-	-	-34023	68722	99	56578	834	< .001	0.25
1-class	-	yes	-37813	75762	20	64158	913	< .001	0.15
2-class	-	yes	-35390	71053	40	59313	893	< .001	0.19
3-class	-	yes	-34691	69792	60	57915	873	< .001	0.23
1-class	2	-	-35724	71592	21	59981	912	< .001	0.19
2-class	2	-	-34804	69889	41	58141	892	< .001	0.22
3-class	2	-	-34354	69124	61	57240	872	< .001	0.24
1-class	2	yes	-35659	71469	22	59851	911	< .001	0.19
2-class	2	yes	-34749	69785	42	58031	891	< .001	0.22
3-class*	2	yes	-34284	68992	62	57101	871	< .001	0.25
3-class	3	yes	-34316	69069	64	57165	869	< .001	0.25

* This model was considered optimal in the current study.

E.8 Attribute importance for the 3 preference classes in the final model

	Class 1	Class 2	Class 3	Total*
Size	0.40	0.30	0.30	1.00
Stability	0.23	0.25	0.21	0.22
Attachment	0.20	0.29	0.30	0.24
Autonomy	0.21	0.24	0.14	0.19
Achievement	0.17	.02	.09	0.13
Enjoyment	0.20	0.20	0.27	0.22

* Attribute importance is weighted by group size and based on the parameters of table 4 in the article text.

E.9 Explorative analyses of subgroup preferences

Preferences for items of the ICECAP-A (e.g., the 'stability' item adds more to well-being than the 'achievement' item) differ not only between countries, but also between groups of people (e.g., older people value 'stability' and 'achievement' differently than younger people). A tariff for a certain population should reflect both these between-item and between-group differences. An additional advantage of exploring subgroups of people who differ in which capabilities they value over others, is that it can be helpful to learn what aspects of quality of life are important for different people. This might eventually translate into more personalized interventions, where the focus of an intervention is adjusted to the values of the patient.

Subgroups were derived from various sociodemographic variables after developing the tariff. First, the sum of squares (based on best-minus-worst scores) of the five capabilities were compared for these subgroups using multiple ANOVA analyses, to separately investigate their relation to capability preferences (see Table E9.1). Second, demographic variables were added to the scale-adjusted latent class analysis to investigate their influence on class membership probability, which is a more rigorous approach to assess heterogeneity in preferences. Subgroups were based on age, gender, marital status, the presence of children, education, employment status, happiness and the presence of a chronic illness. Analyses were exploratory in nature, so should be interpreted with caution.

Subgroup results based on best-minus-worst sum-of-squares comparisons

Exploring preference differences between sum of squares of best-minus-worst scores across different subgroups yielded several results.

1. Higher age was associated with a stronger preference for stability and autonomy and weaker preference for attachment. People aged 40 years or younger found achievement and enjoyment less important than their older counterparts and people aged 41-60 years found enjoyment more important than both older and younger people;
2. Women in the sample valued attachment more than men;
3. People who were in a relationship had a stronger preference for enjoyment than people who were single, divorced or widowed;
4. People without children tended to have a stronger preference for attachment than people with children;
5. There were no apparent differences in preferences between people with different educational levels;
6. Stability was more important for people who indicated to be happy (i.e., very happy or fairly happy) compared to those indicating to be unhappy (i.e., not very happy or unhappy);
7. Preferences did not seem to differ between people with or without a chronic illness;
8. Comparing employed people with people who were unemployed or had an occupational disability yielded no differences in capability preferences.

Subgroup results based on class membership probabilities

Secondly, the demographic variables were added to the final model used for the tariff (see

E9.1 Results of subgroup preferences based on sum of squares comparisons

Group comparisons	N	Mean sum of squares (standard deviation) ^a				
		Stability	Attachment	Autonomy	Achievement	Enjoyment
Age ≤ 40	317	0.92 (0.76)	1.11 (0.81)	0.58 (0.53)*	0.53 (0.50)*	0.70 (0.65)*
40 < Age ≤ 60	324	0.80 (0.73)	1.01 (0.84)	0.72 (0.65)*	0.65 (0.66)	0.97 (0.85)*
Age > 60	292	0.99 (0.71)*	0.83 (0.74)*	0.91 (0.78)*	0.67 (0.68)	0.83 (0.66)*
Male	453	0.90 (0.73)	0.87 (0.74)*	0.75 (0.67)	0.58 (0.55)	0.84 (0.76)
Female ^b	479	0.90 (0.75)	1.10 (0.85)*	0.72 (0.67)	0.64 (0.68)	0.83 (0.71)
Relationship	636	0.88 (0.74)	1.01 (0.81)	0.71 (0.64)	0.60 (0.60)	0.88 (0.77)*
No relationship	297	0.94 (0.74)	0.94 (0.80)	0.78 (0.73)	0.65 (0.66)	0.74 (0.66)*
Children	581	0.91 (0.75)	0.94 (0.79)*	0.75 (0.68)	0.64 (0.66)	0.86 (0.75)
No children	352	0.88 (0.72)	1.06 (0.83)*	0.70 (0.66)	0.58 (0.55)	0.79 (0.71)
Higher education	351	0.91 (0.74)	0.99 (0.84)	0.75 (0.67)	0.57 (0.54)	0.88 (0.76)
Medium education	394	0.85 (0.71)	1.02 (0.80)	0.73 (0.68)	0.62 (0.62)	0.80 (0.69)
Lower education ^c	182	0.98 (0.80)	0.91 (0.79)	0.70 (0.66)	0.67 (0.75)	0.81 (0.77)
Happy	797	0.92 (0.75)*	0.99 (0.81)	0.73 (0.64)	0.61 (0.61)	0.84 (0.72)
Unhappy	136	0.78 (0.67)*	0.99 (0.81)	0.77 (0.81)	0.65 (0.69)	0.78 (0.79)
No illness	574	0.93 (0.75)	1.01 (0.83)	0.73 (0.68)	0.59 (0.58)	0.84 (0.73)
Illness present	359	0.84 (0.72)	0.95 (0.77)	0.73 (0.66)	0.64 (0.67)	0.83 (0.74)
Employed	811	0.91 (0.74)	0.98 (0.80)	0.73 (0.66)	0.60 (0.61)	0.83 (0.73)
Unemployed/ occupational disability	122	0.83 (0.75)	1.01 (0.85)	0.78 (0.73)	0.70 (0.65)	0.88 (0.79)

^a The sum of squares of the five capabilities, based on best-minus-worst scores of participants, were compared for the subgroups using multiple ANOVA analyses, to separately investigate their relation to capability preferences. A alpha value of .05 was maintained to test for significance and multiple testing was not accounted for.

^b One participant indicated gender as other and is not included in this analysis.

^c One participant is missing from this analysis since the response to this question was not interpretable.

* Indicates significant difference between (at least one of) the other group(s).

table 4 in the text). Parameters can be found in Table E9.2 The presented odds ratios indicate the probability of a subgroup to be in one class compared to another class. To more easily interpret the results we maintained the following descriptions of the three preference classes based on the parameters of the final model.

- People in class 1 value all five capabilities with no clear preference for one or the other;
- Class 2 is signified by a very low preference for achievement with high preferences for the other capabilities, especially attachment;
- People in class 3 value attachment and enjoyment highly and attach less value to autonomy and achievement.

Some findings can be deduced from these analyses.

1. Younger people are less likely to be in class 2, indicating that achievement is less important for them than their older counterparts. At an older age, the value for capabilities seem to even out as people are more likely to be in class 1;
2. Females are more likely than males to be in class 3, suggesting that they especially value attachment and enjoyment (at the expense of autonomy and achievement);
3. People in a relationship seem to value attachment and enjoyment (at the expense of autonomy and achievement) more than people who are not in a relationship;
4. People without children are more likely to be in class 2, indicating that they attach little value to achievement and much value to attachment;
5. People that enjoyed higher education seem to be less likely to be in class 2, suggesting that they value achievement more (at the expense of attachment);
6. Higher happiness seems to be related with more even preferences over the capabilities (higher probability of being in class 1) and more value attached to achievement (lower probability of being in class 2) compared to people with lower happiness ratings;
7. While the differences were not large, people that are unemployed seem to have stronger preferences (mostly regarding attachment and enjoyment), while employed people do not show preferences and regard all capabilities as equally important;
8. People with a chronic illness are more likely to be in class 2 or 3, possibly because they value attachment and enjoyment (at the expense of autonomy and achievement) more than people without a chronic illness.

Conclusion

While these results are tentative, they show that preferences for domains of quality of life can differ substantially for different people. The results from the sum-of-squares comparisons and class membership probabilities align well and might be interesting starting points for further exploration. Consequently, researchers and clinicians can build on this knowledge by attempting to tailor interventions for specific subgroups, for example by developing interventions for people who are unhappy focused on attachment instead of achievement.

E9.2 Results of subgroup preferences based on class membership probability*

Demographic (Wald, <i>p</i> -value)	Group	Class 1 Coef (OR ^a)	Class 2 Coef (OR ^a)	Class 3 Coef (OR ^a)	OR ^b Class 1-2	OR ^c Class 1-3	OR ^d Class 2-3
Age (24.6, <i>p</i> < .001)	<= 40	Ref.	Ref.	Ref.			
	41 <Age< 60	0.26 (1.30)	-0.57 (0.57)	0.31 (1.36)	2.29	0.95	0.41
	> 60	0.45 (1.57)	-0.28 (0.76)	-0.17 (0.84)	2.08	1.86	0.90
Gender (17.7, <i>p</i> < .001)	Male	Ref.	Ref.	Ref.			
	Female	-0.23 (0.79)	-0.27 (0.76)	0.5 (1.64)	1.04	0.48	0.47
Relation (9.8, <i>p</i> = .007)	No	Ref.	Ref.	Ref.			
	Yes	-0.17 (0.84)	-0.25 (0.78)	0.42 (1.52)	1.08	0.55	0.51
Children (10.1, <i>p</i> = .007)	Yes	Ref.	Ref.	Ref.			
	No	-0.25 (0.78)	0.41 (1.50)	-0.16 (0.85)	0.52	0.91	1.76
Education (21.9, <i>p</i> < .001)	High	Ref.	Ref.	Ref.			
	Middle	-0.33 (0.72)	0.34 (1.41)	-0.01 (0.99)	0.51	0.73	1.43
	Low	-0.48 (0.62)	0.64 (1.91)	-0.16 (0.85)	0.32	0.72	2.24
Happiness (10.7, <i>p</i> = .005)	Unhappy	Ref.	Ref.	Ref.			
	Happy	0.46 (1.59)	-0.46 (0.63)	0.0 (1.00)	2.53	1.59	0.63
Employment (4.7, <i>p</i> = .098)	Unemployed/ occupational disability	Ref.	Ref.	Ref.			
	Employed	0.40 (1.49)	-0.24 (0.79)	-0.16 (0.85)	1.89	1.75	0.92
Illness (10.1, <i>p</i> = .006)	Yes	Ref.	Ref.	Ref.			
	No	0.34 (1.41)	-0.29 (0.75)	-0.05 (0.95)	1.88	1.49	0.79

* One participant with other gender was excluded from this analysis to make the data software compatible
Coef=coefficient, OR=Odds ratio, Ref.=Reference.

^a This signifies the odds ratio of a subgroup being in a preference class compared to the reference (e.g., 1.3 times more likely to be in this class than the reference subgroup)

^b This signifies the odds ratio of being in preference class 1 compared to class 2 (e.g., 2.29 times more likely to be in class 1 than class 2).

^c This signifies the odds ratio of being in preference class 1 compared to class 3 (e.g., 0.95 times more likely to be in class 1 than class 3).

^d This signifies the odds ratio of being in preference class 2 compared to class 3 (e.g., 0.41 times more likely to be in class 2 than class 3).

Chapter F

Supplemental Material for Chapter 7

F.1 Quality-of-life instruments information

F1.1 EQ-5D-5L

The primary outcome measure for the economic evaluation was quality-of-life adjusted life years (QALYs) as assessed with the EQ-5D-5L (EuroQol Group, 1990). The self-report questionnaire measures health related quality of life on five dimensions (i.e., mobility, self-care, usual activities, pain/discomfort and anxiety/depression) on five levels ranging from no disability to extreme disability. The EQ-5D-5L also contains a visual analogue scale on which respondents are asked to rate their current health on a scale from 0 (worst health imaginable) to 100 (best health imaginable). The EQ-5D-5L is widely used and has demonstrated adequate psychometric properties (Feng et al., 2021). The five dimensions with five levels sum up to 3125 possible health states. The Dutch tariff (Versteegh et al., 2016) was used to translate each health state to a utility value anchored at 0 (death) and 1 (perfect health). Utility values were calculated into QALYs over the 14 month follow-up period using the area-under-curve method. This means that utility values were multiplied by the time spent in a certain health state (i.e., 8 weeks or 3 months), where transitions between different health states were linearly interpolated.

F1.2 ICECAP-A

The ICECAP-A (Al-Janabi et al., 2012) presents the five capabilities of stability, attachment, autonomy, achievement, and enjoyment on a four-point scale ranging from not at all to fully being able to experience a capability, and measures the extent to which people are able to do the things they wish. Psychometric properties of the ICECAP-A have been found to be adequate (Afentou & Kinghorn, 2020), also for the Dutch translation (Rohrbach, Dingemans, Essers, et al., 2021). The five capabilities with four levels amount to 1024 possible capability states. Similar to the method used to calculate utility values and corresponding QALYs, a capability value anchored at 0 (no capability) and 1 (full capability) was calculated for each participant using the ICECAP-A Dutch tariffs (Rohrbach, Dingemans, Groothuis-Oudshoorn, et al., 2021) over the 14 month study period.

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F.2 Multiple imputation methods

According to the intention-to-treat approach, all participants who completed baseline were included throughout the analyses. Missing data were multiply imputed (Rubin, 1987) using the software program R version 3.5.1. Categorical variables were imputed using (multinomial) logistic regression. For numerical variables predictive mean matching was used (Rubin, 1986; Van Buuren, 2012). Body weight was skewed to the right at each time point. The weight variables were log transformed to variables closer to normal. Subsequently, linear regression was used to impute these transformed variables. Original weight variables were then imputed through passive imputation (Van Buuren & Groothuis-Oudshoorn, 2011) by back-transforming the log transformed weight variables.

For each variable with missing data a specific number of predictors was used for the prediction of the missing values. This number was determined by using a rule of thumb of 15 cases per predictor (Stevens, 2001). Predictors for the missing data were the variables that were most strongly associated with the variable with missing data. The measure of association used between the variable with missing data and the potential predictor was dependent on the scale level (i.e., numerical or categorical) of both variables. Correlation, partial η^2 and Cramér's V were used for situations where both variables were numerical, variables had a different scale level and both variables were categorical respectively. Missing data were imputed 100 times, creating 100 complete versions of the incomplete dataset.

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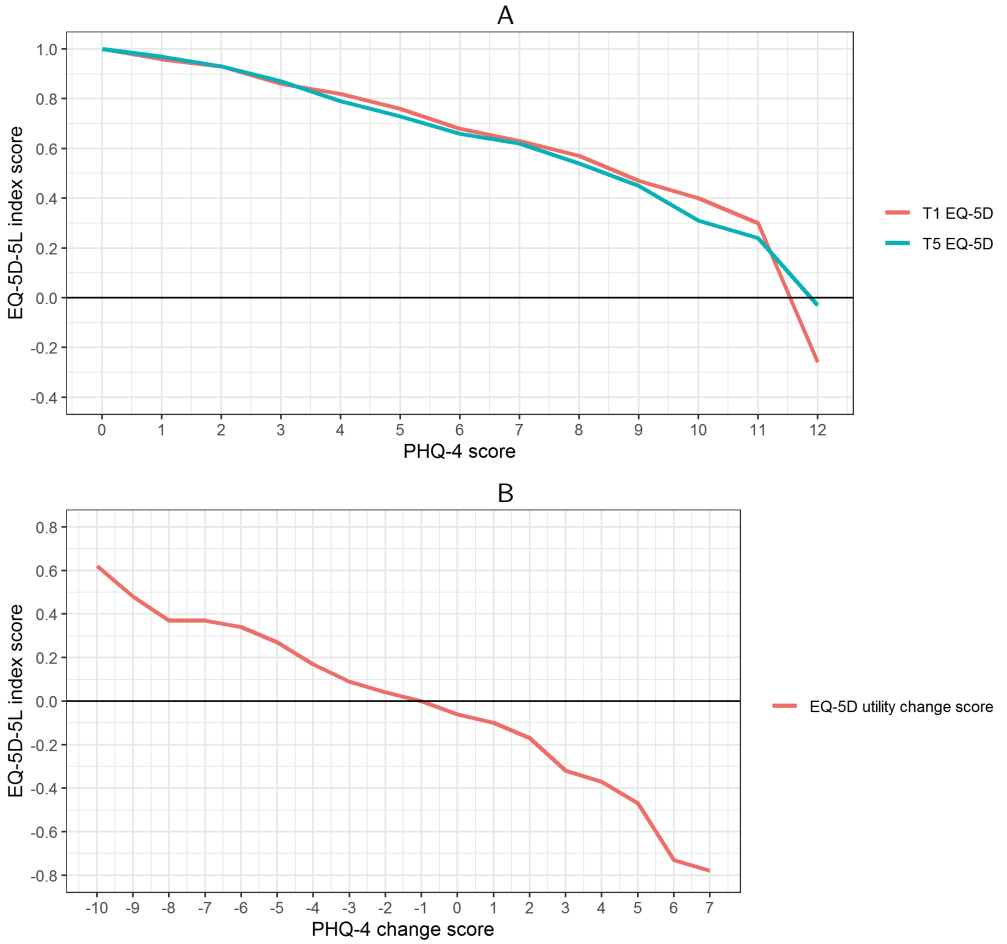
F.3 PHQ-4 to EQ-5D-5L mapping using the equipercentile linking method

In order to map baseline (T0) scores of the PHQ-4 onto the EQ-5D-5L the equipercentile linking method, as explained Kolen and Brennan (2013) and applied by Furukawa et al. (2021), was used. First, Spearman correlations between the PHQ-4 and EQ-5D-5L utility scores were calculated. Spearman correlations were used since the EQ-5D-5L distribution was skewed. Moderate to high correlations (> 0.3) have been successfully used in equipercentile linking. Table F3.1 presents the correlations found between PHQ-4 and EQ-5D-5L scores. Strong correlations were found between the two questionnaires at T1 ($r = -0.66$) and T5 ($r = -0.71$) and a moderate correlation for change scores from T1-T5 ($r = -0.48$). Second, a table with cumulative percentages for the thirteen possible PHQ-4 scores (range 0 – 12) was made for the post-intervention assessment (T1). Corresponding scores of the EQ-5D-5L (based on cumulative percentiles at T1) were identified for the thirteen possible PHQ-4 scores, resulting in a mapping table between the PHQ-4 and EQ-5D-5L. The mapping was applied to PHQ-4 scores at T0 to estimate T0 EQ-5D-5L utility scores. These utility scores were then used for one of the sensitivity analysis described in the main article. Graphical displays of the mapping for various measures of the two questionnaires can be found in Figure F3.2. The final mapping is presented in Table F3.3. Lastly, EQ-5D-5L utility scores for mapped T0, mapped T1 and sample-deduced ('original') T1 scores per study condition can be found in Table F3.4.

F3.1 Spearman correlations between the EQ-5D-5L and PHQ-4 scores at T1, T5 and change scores (T1-T5)

	T1 PHQ	T5 PHQ	T1 EQ-5D	T5 EQ-5D	T1-T5 change PHQ	T1-T5 change EQ-5D
T1 PHQ	1.00	.52	-.66	-.47	-.49	.23
T5 PHQ		1.00	-.51	-.71	.42	-.20
T1 EQ-5D			1.00	.64	.17	-.40
T5 EQ-5D				1.00	-.24	.35
T1-T5 change PHQ					1.00	-.48
T1-T5 change EQ-5D						1.00

F3.2 Equipercentile mapping plots for (A) PHQ-4 and EQ-5D-5L at T1 and T5, and (B) PHQ-4 and EQ-5D-5L T1-T5 change scores



F3.3 Final mapping table based on T1 scores of the PHQ-4 and EQ-5D-5L

PHQ-4 score	EQ-5D-5L score	Cumulative percentile
0	1.00	1.1
1	0.96	3.7
2	0.93	6.8
3	0.86	13.0
4	0.82	22.8
5	0.76	31.5
6	0.68	42.8
7	0.63	54.9
8	0.57	67.6
9	0.47	78.3
10	0.40	84.8
11	0.30	92.7
12	-0.26	100.0

F3.4 Mean EQ-5D-5L utility scores and standard errors using the final mapping

EQ-5D-5L utility	Featback (N=88)	Featback + Expert- patient support (N = 90)	Expert- patient support (N = 87)	Waiting list (N = 90)	Total sample (N = 355)
Baseline (T0): mapped	0.49 (0.04)	0.48 (0.04)	0.45 (0.04)	0.43 (0.04)	0.46 (0.02)
Post intervention (T1): mapped	0.62 (0.03)	0.63 (0.03)	0.54 (0.03)	0.49 (0.04)	0.57 (0.02)
Post intervention (T1): original	0.68 (0.03)	0.68 (0.03)	0.61 (0.03)	0.58 (0.03)	0.64 (0.01)

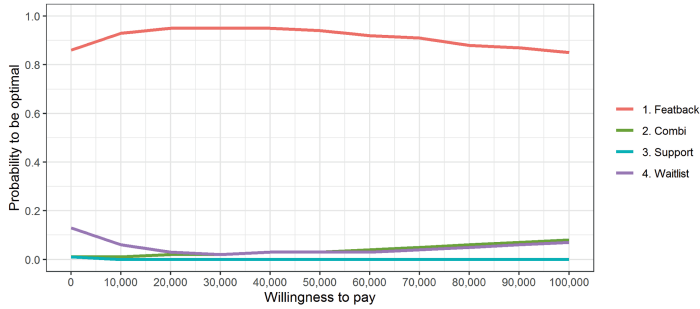
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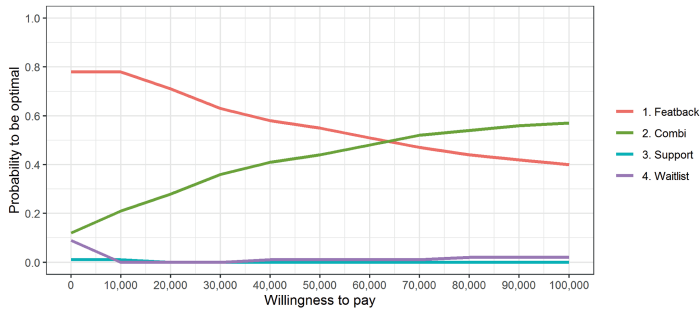
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F.4 Results of sensitivity analyses

F4.1 Cost-utility acceptability curves with the EQ-5D-5L visual analogue scale



F4.2 Cost-utility acceptability curves with direct health care costs only



F4.3 Cost-utility acceptability curves with baseline EQ-5D-5L values derived from the PHQ-4 equipercentile mapping procedure

