Supplement

(Digital Cognitive Behavioral Therapy to Reduce Suicidal Ideation and Behaviours: A Systematic Review and Meta-Analysis of Individual Participant Data, Büscher et al.)

eMethods 1: Deviations from the protocol

Deviations from the protocol	Reasons
We did not include risk of bias as a study-level moderator.	Abstracting the outcome of a risk of bias analysis in the form of a study quality scale is discouraged by leading experts in the field.[1–3] Any moderator analysis grouping studies by risk of bias or directly using quality scales is hence prone to propagating problems with the underlying scales.
We did not z-standardize suicidal ideation measures across trials.	z-standardization would eliminate any mean differences between studies. We therefore only scaled the change scores to their study-specific variance to ensure comparability between different scales. Location was already comparable as we were studying relative differences using change scores.
We did not conduct sensitivity analyses for guided vs. unguided interventions and the type of control group.	These variables were already included in the moderator analyses, so a sensitivity analysis would be redundant.
We did not conduct a sensitivity analysis for interventions for youth.	As we only had few studies (with only few observations) for the youth intervention, we only conducted the sensitivity analysis here for the adult interventions.

eMethods 2: PRISMA IPD checklist

PRISMA-IPD Section/topic	Item No	Checklist item	Reported on page
Title			
Title	1	Identify the report as a systematic review and meta-analysis of individual participant data.	1
Abstract			
Structured summary	2	Provide a structured summary including as applicable:	2
		Background: state research question and main objectives, with information on participants, interventions, comparators and outcomes.	
		Methods: report eligibility criteria; data sources including dates of last bibliographic search or elicitation, noting that IPD were sought; methods of assessing risk of bias.	
		Results: provide number and type of studies and participants identified and number (%) obtained; summary effect estimates for main outcomes (benefits and harms) with confidence intervals and measures of statistical heterogeneity. Describe the direction and size of summary effects in terms meaningful to those who would put findings into practice.	
		Discussion: state main strengths and limitations of the evidence, general interpretation of the results and any important implications.	
		Other: report primary funding source, registration number and registry name for the systematic review and IPD meta-analysis.	
Introduction			
Rationale	3	Describe the rationale for the review in the context of what is already known.	4
Objectives	4	Provide an explicit statement of the questions being addressed with reference, as applicable, to participants, interventions, comparisons, outcomes and study design (PICOS). Include any hypotheses that relate to particular types of participant-level subgroups.	5
Methods			

Protocol and registration	5	Indicate if a protocol exists and where it can be accessed. If available, provide registration information including registration number and registry name. Provide publication details, if applicable.	4+7
Eligibility criteria	6	Specify inclusion and exclusion criteria including those relating to participants, interventions, comparisons, outcomes, study design and characteristics (e.g. years when conducted, required minimum follow-up). Note whether these were applied at the study or individual level i.e. whether eligible participants were included (and ineligible participants excluded) from a study that included a wider population than specified by the review inclusion criteria. The rationale for criteria should be stated.	5
Identifying studies - information sources	7	Describe all methods of identifying published and unpublished studies including, as applicable: which bibliographic databases were searched with dates of coverage; details of any hand searching including of conference proceedings; use of study registers and agency or company databases; contact with the original research team and experts in the field; open adverts and surveys. Give the date of last search or elicitation.	5
Identifying studies - search	8	Present the full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Appendix
Study selection processes	9	State the process for determining which studies were eligible for inclusion.	5
Data collection processes	10	Describe how IPD were requested, collected and managed, including any processes for querying and confirming data with investigators. If IPD were not sought from any eligible study, the reason for this should be stated (for each such study).	5
		If applicable, describe how any studies for which IPD were not available were dealt with. This should include whether, how and what aggregate data were sought or extracted from study reports and publications (such as extracting data independently in duplicate) and any processes for obtaining and confirming these data with investigators.	
Data items	11	Describe how the information and variables to be collected were chosen. List and define all study level and participant level data that were sought, including baseline and follow-up information. If applicable, describe methods of standardising or translating variables within the IPD datasets to ensure common scales or measurements across studies.	5
IPD integrity	A1	Describe what aspects of IPD were subject to data checking (such as sequence generation, data consistency and completeness, baseline imbalance) and how this was done.	5
Risk of bias assessment in individual studies.	12	Describe methods used to assess risk of bias in the individual studies and whether this was applied separately for each outcome. If applicable, describe how findings of IPD checking were used to inform the assessment. Report if and how risk of bias assessment was used in any data synthesis.	6
Specification of outcomes and effect measures	13	State all treatment comparisons of interests. State all outcomes addressed and define them in detail. State whether they were pre-specified for the review and, if applicable, whether they were primary/main or secondary/additional outcomes. Give the principal measures of effect (such as risk ratio, hazard ratio, difference in means) used for each outcome.	6-7
Synthesis methods	14	Describe the meta-analysis methods used to synthesise IPD. Specify any statistical methods and models used. Issues should include (but are not restricted to): • Use of a one-stage or two-stage approach. • How effect estimates were generated separately within each study and combined across studies (where applicable). • Specification of one-stage models (where applicable) including how clustering of patients within studies was accounted for.	6-7 + Appendix

		• Use of fixed or random effects models and any other model assumptions, such as proportional hazards. • How (summary) survival curves were generated (where applicable). • Methods for quantifying statistical heterogeneity (such as I^2 and τ^2). • How studies providing IPD and not providing IPD were analysed together (where applicable). • How missing data within the IPD were dealt with (where applicable).	
Exploration of variation in effects	A2	If applicable, describe any methods used to explore variation in effects by study or participant level characteristics (such as estimation of interactions between effect and covariates). State all participant-level characteristics that were analysed as potential effect modifiers, and whether these were pre-specified.	6-7
Risk of bias across studies	15	Specify any assessment of risk of bias relating to the accumulated body of evidence, including any pertaining to not obtaining IPD for particular studies, outcomes or other variables.	6
Additional analyses	16	Describe methods of any additional analyses, including sensitivity analyses. State which of these were pre-specified.	Appendix
Results			
Study selection and IPD obtained	17	Give numbers of studies screened, assessed for eligibility, and included in the systematic review with reasons for exclusions at each stage. Indicate the number of studies and participants for which IPD were sought and for which IPD were obtained. For those studies where IPD were not available, give the numbers of studies and participants for which aggregate data were available. Report reasons for non-availability of IPD. Include a flow diagram.	7, Fig.1
Study characteristics	18	For each study, present information on key study and participant characteristics (such as description of interventions, numbers of participants, demographic data, unavailability of outcomes, funding source, and if applicable duration of follow-up). Provide (main) citations for each study. Where applicable, also report similar study characteristics for any studies not providing IPD.	7-8, Table 1, Appendix
IPD integrity	A3	Report any important issues identified in checking IPD or state that there were none.	None.
Risk of bias within studies	19	Present data on risk of bias assessments. If applicable, describe whether data checking led to the up-weighting or down-weighting of these assessments. Consider how any potential bias impacts on the robustness of meta-analysis conclusions.	9
Results of individual studies	20	For each comparison and for each main outcome (benefit or harm), for each individual study report the number of eligible participants for which data were obtained and show simple summary data for each intervention group (including, where applicable, the number of events), effect estimates and confidence intervals. These may be tabulated or included on a forest plot.	Appendix
Results of syntheses	21	Present summary effects for each meta-analysis undertaken, including confidence intervals and measures of statistical heterogeneity. State whether the analysis was pre-specified, and report the numbers of studies and participants and, where applicable, the number of events on which it is based.	8-9, Tables 2+4
		When exploring variation in effects due to patient or study characteristics, present summary interaction estimates for each characteristic examined, including confidence intervals and measures of statistical heterogeneity. State whether the analysis was pre-specified. State whether any interaction is consistent across trials.	

		Provide a description of the direction and size of effect in terms meaningful to those who would put findings into practice.	
Risk of bias across studies	22	Present results of any assessment of risk of bias relating to the accumulated body of evidence, including any pertaining to the availability and representativeness of available studies, outcomes or other variables.	9-10
Additional analyses	23	Give results of any additional analyses (e.g. sensitivity analyses). If applicable, this should also include any analyses that incorporate aggregate data for studies that do not have IPD. If applicable, summarise the main meta-analysis results following the inclusion or exclusion of studies for which IPD were not available.	8 + Appendix
Discussion			
Summary of evidence	24	Summarise the main findings, including the strength of evidence for each main outcome.	10-11
Strengths and limitations	25	Discuss any important strengths and limitations of the evidence including the benefits of access to IPD and any limitations arising from IPD that were not available.	10-12
Conclusions	26	Provide a general interpretation of the findings in the context of other evidence.	12
Implications	A4	Consider relevance to key groups (such as policy makers, service providers and service users). Consider implications for future research.	12
Funding			
Funding	27	Describe sources of funding and other support (such as supply of IPD), and the role in the systematic review of those providing such support.	13

A1 – A3 denote new items that are additional to standard PRISMA items. A4 has been created as a result of re-arranging content of the standard PRISMA statement to suit the way that systematic review IPD meta-analyses are reported.

eMethods 3: Search strategy

Note: The full search strategy including search strings for CENTRAL, PsyINFO and Embase was published in the study protocol (doi:10.3390/ijerph17145179).

Search string for Pubmed:

(computers[MeSH Terms] OR software[MeSH Terms] OR internet[MeSH Terms] OR web browser[MeSH Terms] OR technology[MeSH Terms] OR cell phone[MeSH Terms] OR mobile applications[MeSH Terms] OR therapy, computer-assisted[MeSH Terms] OR telemedicine[MeSH Terms] OR telerehabiliation[MeSH Terms] OR medical informatics[MeSH Terms] OR distance counseling[MeSH Terms] OR technolog*[Title/Abstract] OR software[Title/Abstract] OR web[Title/Abstract] OR “app-based”[Title/Abstract] OR “app based”[Title/Abstract] OR internet[Title/Abstract] OR online[Title/Abstract] OR computer*[Title/Abstract] OR cyber[Title/Abstract] OR electronic[Title/Abstract] OR “world wide web”[Title/Abstract] OR www[Title/Abstract] OR net[Title/Abstract] OR digital[Title/Abstract] OR virtual[Title/Abstract] OR website[Title/Abstract] OR chat[Title/Abstract] OR forum[Title/Abstract] OR e-mail[Title/Abstract] OR email[Title/Abstract] OR SMS[Title/Abstract] OR “text messag*”[Title/Abstract] OR textmessag*[Title/Abstract] OR mobile[Title/Abstract] OR smartphone[Title/Abstract] OR phone[Title/Abstract] OR e-therap*[Title/Abstract] OR “e-mental health”[Title/Abstract] OR “emental health”[Title/Abstract] OR e-health[Title/Abstract] OR ehealth[Title/Abstract] OR mhealth[Title/Abstract] OR m-health[Title/Abstract] OR tele-care[Title/Abstract] OR telecare[Title/Abstract] OR tele-health[Title/Abstract] OR telehealth[Title/Abstract] OR tele-medicine[Title/Abstract] OR telemedicine[Title/Abstract] OR tele-rehabilitation[Title/Abstract] OR telerehabilitation[Title/Abstract] OR telephone [Title/Abstract] OR iCBT[Title/Abstract] OR i-CBT[Title/Abstract] OR cCBT[Title/Abstract] OR c-CBT[Title/Abstract] OR "personal digital assist*"[Title/Abstract] OR PDA[Title/Abstract] OR "cell* phone*"[Title/Abstract]) AND

(suicide[MeSH Terms] OR “self-injurious behavior”[MeSH Terms] OR “suicidal ideation”[MeSH Terms] OR “suicide, attempted”[MeSH Terms] OR suicid*[Title/Abstract] OR self-injur*[Title/Abstract] OR selfinjur*[Title/Abstract] OR self-harm[Title/Abstract] OR selfharm[Title/Abstract] OR self-mutilation[Title/Abstract] OR selfmutilation[Title/Abstract] OR auto-mutilation[Title/Abstract] OR automutilation[Title/Abstract]) AND

(“randomized controlled trials as topic”[MeSH Terms] OR “clinical trials as topic”[MeSH Terms] OR “randomized controlled trial”[Publication Type] OR “controlled clinical trial”[Publication Type] OR “clinical trial”[Publication Type] OR “clinical trial protocol”[Publication Type] OR “clinical study”[Publication Type] OR RCT[Title/Abstract] OR random*[Title/Abstract] OR trial [Title/Abstract])

eMethods 4: Statistical analysis plan

Section/Item	Index	Explanation
Section 1: Administrative Information		
Title and trial registration	1a	Statistical analysis plan (SAP) for the Effectiveness of Digital Interventions to Reduce Suicidal Ideation: A Systematic Review and Meta-Analysis of Individual Participant Data. The study protocol of the present study was published in an open-access peer-reviewed journal under the title: “Effectiveness of Internet-and Mobile-Based Cognitive Behavioral Therapy to Reduce Suicidal Ideation and Behaviors: Protocol for a Systematic Review and Meta-Analysis of Individual Participant Data” (SAP version 1) (https://www.mdpi.com/1660-4601/17/14/5179)
	1b	OSF registration: https://osf.io/45tcd
SAP version		Version 2: December 15, 2020
Protocol version		This document has been written based on information contained in the SAP version 1 (study protocol), dated July 17, 2020
SAP revisions		Version 1: July 17, 2020 Version 2: December 15, 2020
		Amendments (Version 2) were made to improve quality of analysis. This protocol gives an overview of general procedures. We will list any changes to the protocol in the respective section.
Roles and responsibility	2	Marie Beisemann, Prof. Dr. Philipp Doebler and Rebekka Büscher were responsible for the SAP.
Signatures		The SAP has been written by: Marie Beisemann Department of Statistics, TU Dortmund University, Germany  December 15, 2020 Prof. Dr. Philipp Doebler Department of Statistics, TU Dortmund University, Germany  December 15, 2020 Rebekka Büscher Department of Rehabilitation Psychology and Psychotherapy, Albert-Ludwigs-University of Freiburg, Germany  December 15, 2020
		Analyses will be conducted by Marie Beisemann and Rebekka Büscher.
		Chief investigator:

		Dr. Lasse Sander Department of Rehabilitation Psychology and Psychotherapy University of Freiburg, Germany
Section 2: Introduction		
Background and rationale	3	Please see the protocol or the manuscript for a detailed rationale. In short: Suicidal ideation and behaviors are a major public health issue. Digital interventions could be a low-threshold and effective treatment approach, complementing current face-to-face treatment options.
Objectives	4	This study aims to investigate whether digital intervention for the treatment of suicidal ideation and behaviors are effective in reducing suicidal ideation and behavior.
Changes to the protocol		We will additionally include an explorative analysis on the effectiveness on suicidal behavior (i.e., suicide attempts).
Section 3: Study Methods		
Design		Individual participant data meta-analysis (IPD-MA) of randomized controlled trials (RCTs) comparing digital interventions for individuals with suicidal ideation against treatment as usual (TAU), other active or passive control conditions, no intervention, or wait-list groups.
Data sources		Individual participant data (IPD) from primary studies. Data extracted from published reports and from contacts with authors.
Analysis objectives		1) Effectiveness of iCBT for suicidality on suicidal ideation [continuous effect size] 2) Clinically relevant changes in suicidal ideation [reliable change index, ordinal (reliable improvement, no change, reliable deterioration); response rate, binary] 3) Identify effect moderators on participant level, intervention level, and study level for suicidal ideation 4) Examine treatment adherence and predictors for adherence 5) Examine the effectiveness of iCBT on suicide attempts
Eligibility criteria		Participants: experiencing suicidal ideation at baseline. Interventions: specifically targeting suicidal ideation or behaviors, based on cognitive behavioral therapy, delivered in an internet- or mobile-based setting, guided or self-guided. Exclusion: blended care, gatekeeper interventions, help-seeking interventions, stigma interventions. Comparisons: TAU, placebo, waitlist, no intervention, waitlist, another active/passive control. Outcomes: Quantitative measure of suicidal ideation. Study design: Randomized controlled trial. If trials contain eligible participants, but not all participants are eligible (e.g. not experiencing suicidal ideation at baseline), they will be included. Ineligible participants (e.g., not reporting suicidal ideation at baseline) will be excluded from the analyses.
Endpoints		Suicidal ideation: continuous measure (change scores); reliable change index (RCI) per person (improvement, no change, deterioration: ordinal coding with three categories); response rate (50% symptom reduction = response). Treatment adherence: defined as the proportion of completed modules (technically assessed). Suicide attempts: suicide attempts between baseline and post-intervention.
Included time points		Suicidal ideation: We will include measures at baseline, post-intervention, and potential measures at short-term follow-up (<6months after baseline) and long-term follow-up (>6months after baseline). Suicide attempts: We will include suicide attempts between baseline and post-intervention.
Search strategy		Systematic literature searches in the following databases: Cochrane Central Register of Controlled Trials (CENTRAL), PsycINFO, Embase, and Pubmed.
Risk of Bias		Risk of bias will be assessed using Cochrane's Risk of Bias Tool 2.
Quality of evidence		Grading of Recommendations Assessment, Development and Evaluation (GRADE) on outcome level.

Changes to the protocol		We will include suicide attempts as an additional outcome (see Section 2). We will not include risk of bias as a study-level moderator: Abstracting the outcome of a risk of bias analysis in the form of a study quality scale is discouraged by leading experts in the field (Jüni et al., 1999; Greenlad & O'Rourke, 2001; Higgins et al., 2011). Any moderator analysis grouping studies by risk of bias or directly using quality scales is hence prone to propagating problems with the underlying scales.		
Section 4: Statistical Principles				
Confidence intervals and p values		All applicable statistical tests will be performed two-sided using a 5% significance level. For all effects including primary and secondary outcomes, two-sided 95% confidence intervals (CIs) will be reported.		
Intention-to-treat analyses		All randomized participants with suicidal ideation will be included in the analyses. Variables that are missing entirely from one study will not be imputed in order to be conservative.		
Changes to the protocol		No changes.		
Section 6: Statistical procedures:				
Software		Statistical software R will be used for the IPD-MA analyses. Used R packages will be published in the final report. The aggregated meta-analysis will be conducted using Cochrane's Review Manager.		
Multiple imputation		Imputations will be carried out using the R package mice. They will be conducted study-wise (i.e., no information from other trials will inform the respective imputation) and on the level of total scores (i.e., not on item-level, as this would be complicated by jumping rules in questionnaires). Information from other trials will not be used for imputations. We will assess convergence of the imputations using the $\hat{R}$ statistic as well as graphical methods.		
Model comparisons		For the imputed models, we will compare the homogeneous and heterogeneous model (to choose the appropriate one) using two approaches (as statistical methods to this end are not yet very well developed). For both, we will compare the homogeneous and the heterogenous model using a Likelihood Ratio Test separately for each one of the 100 imputed models. We will then (1) calculate the percentage of rejections (which if low speaks for the homogeneous model), and (2) combine the χ^2 values of the 100 model comparisons using the miceadds package, which will allow for a significance test of the combined chi squared values (which speaks for the homogeneous model if non-significant). For the complete observation models, we will use Likelihood ratio tests (which speak for the homogeneous model if non-significant). We will also use those as a sensitivity analysis for our model comparisons on the imputed data.		
Effectiveness on suicidal ideation (SI): prioritization of main analysis strategy		<u>1) One-stage IPD-MA</u>	Continuous measure of SI (change scores)	**Multilevel linear regression.** We will scale the change scores to their study-specific variance to ensure comparability between different scales. Location will be comparable as we will only be studying relative differences with the change scores. We will fit the models without including baseline suicidal ideation as a predictor. The rationale is to be consistent with the other models, which will not include suicidal ideation as a predictor when controlling for baseline suicidal ideation in the dependent variable itself (e.g., with the RCI). Change scores will also incorporate baseline suicidal ideation already. This is also more consistent with the traditional meta-analysis which will be conducted on the change scores. Inclusion of baseline suicidal ideation as a predictor would also change the interpretation of the moderator analyses for the change scores, especially compared to the other measures. To check the robustness of our results, we will

				additionally conduct the analyses for the change scores with including baseline suicidal ideation as a predictor (sensitivity analysis).
			RCI per person (improvement, no change, deterioration; ordinal coding with three categories)	**Multilevel ordinal regression** (in case of computational problems: collapse two categories in one; logistic regression)
			Response rate SI (50% reduction of symptoms; binary coding)	**Multilevel logistic regression**
		2) In case of computational problems in one-stage IPD-MA: <u>Two-stage IPD-MA</u>	Continuous measure of SI (change scores)	Calculate **Hedges' g** and standard errors for each trial (and pool them across trials)
			Reliable change index SI per person (improvement, no change, deterioration; ordinal coding with three categories)	Collapse three categories in two; calculate **log odds ratios** for each trial (and pool them across trials)
			Response rate SI (50% reduction of symptoms = response; binary coding)	Calculate **log odds ratios** (and pool them across trials)
		3) In case of computational problems in two-stage IPD-MA OR additional analysis if we cannot obtain 100% of IPD from eligible trials: <u>Meta-analysis of aggregrated data (traditional meta-analysis).</u>	Continuous measure of SI (change scores)	**Hedges'g** will be calculated (between-group effect sizes using changes from baseline) and pooled across trials using a random effects model (REML estimation); if this analysis step is carried out due to failure to obtain 100% of trails for IPD analysis, subgroup analysis will be performed (differences between studies that provided IPD and those that did not)
			Binary outcome of SI	log Odds Ratios (log-ORs) will be computed and pooled using REML-estimation
Moderators (suicidal ideation)		We will fit a separate model for each moderator. Primary trials will have different combinations of moderator variables, so that separate models will ensure that we will not exclude any trials that assessed the respective variable. If necessary, we		

		will shift continuous variables to the same starting point and scale them to the study-specific variance. Any continuous moderators will be centered (*across* studies, not within) prior to being entered into the moderator analysis. We will collapse categorial variables into two categories. We will not correct for multiple testing to allow sensitive analyses. Therefore, results of moderator analyses should be interpreted with caution. The following moderators were defined a priori (these will be calculated for all three indices of suicidal ideation): <u>Clinical variables:</u> • baseline severity of suicidal ideation • history of suicide attempts • depressiveness • hopelessness • anxiety <u>Sociodemographic variables:</u> • Age • Sex • level of education • relationship status • employment status • treatment history <u>Study-level variables:</u> • human support • treatment dose • type of control group We will conduct additional explorative moderator analyses for the three indices of suicidal ideation. All moderator analyses will be conducted for post-intervention only (not for follow-up).
Predictors of adherence		We will conduct a one-stage IPD-MA with treatment adherence (proportion of completed modules). We will perform a multilevel linear regression (if low values are an issue here, we may use probit transformed proportions instead). We will only include data from the intervention group, as the adherence to interventions is of interest here. We will fit a separate model for each predictor. Primary trials will have different combinations of predictor variables, so that separate models will ensure that we will not exclude any trials that assessed the respective variable. If necessary, we will shift continuous variables to the same starting point and scale them to the study-specific variance. Any continuous predictors will be centered (*across* studies, not within) prior to being entered into the predictor analysis. We will collapse categorial variables into two categories. Predictor analyses will be explorative. We will not correct for multiple testing to allow sensitive analyses. Therefore, results of predictor analyses should be interpreted with caution.
Effectiveness on suicidal behaviour (attempts)		We will conduct a complete case analysis for the effectiveness of iCBT on suicidal behaviour. The reason for this is that the missing-at-random assumption will almost certainly be violated for mostly self-reported suicide attempts.
Measures to adjust for multiplicity, confounders, heterogeneity		We plan to correct for multiple testing across our three dependent measures; while we intend to estimate all models with a frequentist approach, we may divert to Bayesian methods if (1) for any reason the frequentist methods lead to convergence issues which can be remedied with a Bayesian approach or (2) we discover we might need more modelling flexibility in the event that the chosen models do not fit with the data.
Sensitivity analyses		We will conduct the following sensitivity analyses concerning the effectiveness on suicidal ideation: Complete case analysis; Interventions for youth vs. adults;

		Excluding participants <18; Continuous measure of suicidal ideation: controlling for baseline suicidal ideation.
Baseline patient characteristics		Baseline characteristics will be reported in number (%) or mean (SD).
Changes to the protocol		We will not z-standardize suicidal ideation measures across trials. As we used change scores, we are looking at relative differences, which are already comparable if merely scaled to their study-specific variance (but this way, perhaps easier to interpret). Thus, we will only scale the change scores to their study-specific variance to ensure comparability between different scales. As we will include both guided vs. unguided interventions and the type of control group in the moderator analyses, we will not conduct additional sensitivity analyses for those subgroups.
Section 7: References for statistical analyses		

Berlin, J.A.; Santanna, J.; Schmid, C.H.; Szczech, L.A.; Feldman, H.I. Individual patient- versus group-level data meta-regressions for the investigation of treatment effect modifiers: Ecological bias rears its ugly head. *Stat. Med.* 2002, *21*, 371–387, doi:10.1002/sim.1023.
Clarke, M.J. Individual patient data meta-analyses. *Best Pract. Res. Clin. Obstet. Gynaecol.* 2005, *19*, 47–55, doi:10.1016/j.bpobgyn.2004.10.011.
Clarke, M.J.; Stewart, L.A. Obtaining data from randomised controlled trials: How much do we need for reliable and informative meta-analyses? *BMJ* 1994, *309*, 1007, doi:10.1136/bmj.309.6960.1007.
Cooper, H.; Patall, E.A. The relative benefits of meta-analysis conducted with individual participant data versus aggregated data. *Psychol. Methods* 2009, *14*, 165–176, doi:10.1037/a0015565.
Greenland, S., & O'Rourke, K. On the bias produced by quality scores in meta-analysis, and a hierarchical view of proposed solutions. *Biostatistics* 2001, *2*(4), 463-471.
Higgins, J. P., Altman, D. G., Gøtzsche, P. C., Jüni, P., Moher, D., Oxman, A. D., ... & Sterne, J. A. The Cochrane Collaboration's tool for assessing risk of bias in randomised trials. *BMJ* 2011, *343*.
Jacobson, N.S.; Truax, P. Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. J. Consult. Clin. Psychol. 1991, 59, 12–19, doi:10.1037/0022-006X.59.1.12.
Jüni, P., Witschi, A., Bloch, R., & Egger, M. The hazards of scoring the quality of clinical trials for meta-analysis. *JAMA* 1999, *282*(11), 1054-1060.
Riley, R.D.; Lambert, P.C.; Abo-Zaid, G.; Le, L. Meta-analysis of individual participant data: Rationale, conduct, and reporting. *BMJ* 2010, *340*, 521–525, doi:10.1136/bmj.c221.
Riley, R.D.; Steyerberg, E.W. Meta-analysis of a binary outcome using individual participant data and aggregate data. *Res. Synth. Methods* 2010, *1*, 2–19, doi:10.1002/jrsm.4.
Simmonds, M.C.; Higgins, J.P.T.; Stewart, L.A.; Tierney, J.F.; Clarke, M.J.; Thompson, S.G. Meta-analysis of individual patient data from randomized trials: A review of methods used in practice. *Clin. Trials* 2005, *2*, 209–217, doi:10.1191/1740774505cn087oa.
van Buuren S, Groothuis-Oudshoorn K. mice: Multivariate Imputation by Chained Equations in R. *Journal of Statistical Software* 2011, *45*(3), 1-67; doi:10.18637/jss.v045.i03.

eMethods 5: R packages used

- tidyverse
- haven
- lme4
- ordinal
- mice
- miceadds
- lmerTest
- merTools
- dplyr

eMethods 6: Overview of sensitivity analyses

The following pre-specified sensitivity analyses were conducted for the primary outcome. First, we fitted main models and moderator analyses including only participants with complete data. Second, we excluded participants <18 years. Third, we excluded interventions targeting youth or adolescents; we did not perform analyses restricted to interventions for youth as there was insufficient data. Fourth, we conducted an additional logistic regression with the three categories of the RCI collapsed into dichotomous categories (i.e., reliable improvement vs. no improvement). In addition to pre-specified analyses, we conducted change scores analyses controlling for baseline suicidal ideation.

eTable 1: Participant characteristics

			iCBT conditions		**Control conditions**		**Total sample**
	k[a]	n_{total}[b]	mean (SD) or n (%)	n	mean (SD) or n (%)	n	mean (SD) or n (%)
Suicidal ideation[c,d]	9	964	0.929 (0.375)	961	0.923 (0.370)	1925	0.926 (0.372)
History of suicide attempts	6	918	440 (47.9%)	926	447 (48.3%)	1844	887 (48.1%)
Depressiveness[c,e]	8	918	3.368 (1.148)	898	3.361 (1.148)	1816	3.365 (1.147)
Hopelessness[c,f]	5	811	3.747 (1.166)	801	3.662 (1.215)	1612	3.705 (1.191)
Anxiety[c,g]	5	681	2.976 (1.124)	656	3.007 (1.138)	1337	2.991 (1.130)
Worrying[h]	4	603	64.129 (12.417)	587	64.211 (13.246)	1190	64.170 (12.827)
Age	7	942	36.020 (13.514)	954	36.415 (13.279)	1896	36.219 (13.394)
Female gender	9	1012	688 (68.0%)	1007	695 (69.0%)	2019	1383 (68.5%)
Secondary education or higher	7	866	778 (89.8%)	847	773 (91.3%)	1713	1551 (90.5%)
Married/living with partner	5	734	205 (27.9%)	723	200 (27.7%)	1457	405 (27.8%)
Employed	6	330	216 (65.5%)	373	243 (65.1%)	703	459 (65.3%)
Current treatment	6	837	475 (56.8%)	828	452 (54.6%)	1665	927 (55.7%)
Alcohol use[i]	3	218	4.477 (2.993)	214	4.547 (3.017)	432	4.512 (3.002)

Note: These descriptive analyses are based on complete observations (unimputed data). [a]k: number of studies. [b]n_{total}: total number of participants who provided data on the respective variable. [c]Scaled to the study-specific variance as different measures were used. [d]Suicidal ideation: Beck Scale for Suicidal ideation, Depressive Symptom Inventory – Suicidality Subscale, Suicidal Ideation Attributes Scale. [e]Depressiveness: Beck Depression Inventory, Centre for Epidemiological Studies Depression Scale, Hamilton Depression Rating Scale, Patient Health Questionnaire, Reynolds Adolescent Depression Scale. [f]Hopelessness: Beck Hopelessness Scale, Burns Hopelessness Scale. [g]Anxiety: Generalized Anxiety Disorder, Hospital Anxiety and Depression Scale – anxiety subcale, State-Trait Anxiety Inventory for Children. [h]Worrying: Penn State Worrying Questionnaire. [i]Alcohol use: Alcohol Use Disorders Identification Test.

eTable 2: Exploratory analyses of study dropout

	iCBT conditions		Control conditions		Total sample	
	Complete cases, mean (SD) or n (%)	Dropouts, mean (SD) or n (%)	Complete cases, mean (SD) or n (%)	Dropouts, mean (SD) or n (%)	Complete cases, mean (SD) or n (%)	Dropouts, mean (SD) or n (%)
Suicidal ideation	0.931 (0.374)	0.925 (0.377)	0.918 (0.375)	0.931 (0.360)	0.924 (0.374)	0.928 (0.370)
Depressiveness	3.400 (1.076)	3.321 (1.249)	3.273 (1.148)	3.562 (1.123)	3.333 (1.116)	3.424 (1.202)
Hopelessness	3.721 (1.141)	3.784 (1.202)	3.702 (1.181)	3.572 (1.285)	3.711 (1.162)	3.693 (1.242)
Anxiety	2.933 (1.102)	3.020 (1.146)	2.973 (1.197)	3.066 (1.029)	2.955 (1.154)	3.040 (1.097)
Worrying	64.060 (12.979)	64.250 (11.400)	64.258 (13.603)	64.063 (12.103)	64.167 (13.310)	64.177 (11.664)
Alcohol use	4.519 (3.047)	4.439 (2.957)	4.760 (3.165)	4.269 (2.806)	4.649 (3.106)	4.362 (2.884)
Age	36.125 (13.775)	35.882 (13.179)	36.824 (13.844)	35.589 (12.034)	36.506 (13.811)	35.754 (12.684)
Female gender	398 (69.8%)	290 (65.6%)	475 (70.4%)	220 (66.3%)	873 (70.1%)	510 (65.9%)
Secondary education or higher	440 (88.4%)	338 (91.8%)	522 (90.9%)	251 (91.9%)	962 (89.7%)	589 (91.9%)
Employed	149 (62.3%)	67 (73.6%)	178 (61.8%)	65 (76.5%)	327 (62.0%)	132 (75.0%)
Married/living together	110 (27.2%)	95 (28.9%)	133 (27.9%)	67 (27.1%)	243 (27.6%)	162 (28.1%)
Current treatment	290 (58.6%)	185 (54.1%)	322 (56.1%)	130 (51.2%)	612 (57.2%)	315 (52.9%)
History of suicide attempts	242 (47.2%)	198 (48.9%)	282 (46.2%)	165 (52.2%)	524 (46.7%)	363 (50.3%)

Note: Participants who had a missing on the primary outcome at post-intervention were categorized as dropouts. These descriptive analyses were based on the complete observations (unimputed).

eResults 1: Sensitivity analyses

Participants <18 excluded, effectiveness on suicidal ideation (n=1995 participants; k=9 studies):

- Continuous: b=-0.250; 95%-CI -0.325 to -0.175; p<0.001
- Reliable change index: b=0.630; 95%-CI 0.403 to 0.857; p<0.001
- Response rates: b=0.595; 95%-CI 0.397 to 0.793; p<0.001

Interventions for adults as opposed to interventions designed for youth, effects on suicidal ideation at post-intervention (n=1842; k=6):

- Continuous: b=-0.256; 95%-CI -0.334 to -0.178; p<0.001
- Reliable change index: b=0.631; 95%-CI 0.397 to 0.865; p<0.001
- Response rates: b=0.591; 95%-CI 0.383 to 0.799; p<0.001

Reliable change index collapsed onto the two categories “no improvement” (i.e., reliable deterioration or no change) and “improvement” (n=2037; k=9):

b=0.662; 95%-CI: 0.458 to 0.867; p<0.001)

Effects of iCBT on suicidal ideation and moderator analyses (complete observations)

	Severity of suicidal ideation				Reliable changes (RCI[a])			Treatment response (50% symptom reduction)		
	n (k)[b]	**b (SE)[c]**	**95% CI[d]**	**p**	**n (k)[b]**	**95% CI[d]**	**p**	**n (k)[b]**	**95% CI[d]**	**p**
Effects on severity of suicidal ideation										
Treatment effect at post-intervention	1216 (9)	-0.262 (0.048)	-0.356; -0.167	<0.001	0.723 (0.127)	0.474; 0.971	<0.001	0.676 (0.125)	0.430; 0.922	<0.001
Treatment effect at follow-up	321 (4)	-0.162 (0.087)	-0.333; 0.010	0.194	0.358 (0.250)	-0.132; 0.848	0.456	0.698 (0.240)	0.228; 1.172	0.011
Moderator analyses										
Suicidal ideation	1216 (9)	-0.222 (0.125)	-0.467; 0.024	0.230	0.053 (0.350)	-0.633; 0.740	1.000	0.187 (0.346)	-0.493; 0.867	1.000
History of suicide attempts	1084 (6)	-0.217 (0.101)	-0.415; -0.020	0.095	0.341 (0.262)	-0.171; 0.854	0.575	0.161 (0.269)	-0.366; 0.691	1.000
Depressiveness	1146 (8)	0.007 (0.045)	-0.081; 0.095	1.000	-0.040 (0.118)	-0.271; 0.191	1.000	-0.117 (0.118)[e]	-0.349; 0.114	0.963
Hopelessness	1006 (5)	-0.038 (0.044)	-0.125; 0.049	1.000	0.096 (0.115)	-0.129; 0.321	1.000	0.211 (0.121)	-0.025; 0.449	0.240
Anxiety	730 (5)	-0.096 (0.056)	-0.206; 0.014	0.261	0.253 (0.148)	-0.037; 0.543	0.263	0.265 (0.142)	-0.014; 0.546	0.189
Worrying	795 (4)	-0.001 (0.004)	-0.009; 0.008	1.000	0.007 (0.011)	-0.015; 0.029	1.000	-0.007 (0.012)	-0.030; 0.015	1.000
Age	1135 (7)	-0.002 (0.004)	-0.009; 0.005	1.000	0.002 (0.009)	-0.016; 0.020	1.000	-0.009 (0.009)	-0.028; 0.009	0.969
Female gender	1207 (9)	-0.045 (0.106)	-0.252; 0.161	1.000	0.122 (0.273)	-0.414; 0.658	1.000	0.053 (0.270)	-0.478; 0.580	1.000
Secondary education or higher	1039 (7)	0.014 (0.168)	-0.316; 0.341	1.000	-0.147 (0.424)	-0.979; 0.685	1.000	-0.108 (0.467)	-1.012; 0.828	1.000
Married/living with partner	848 (5)	-0.052 (0.125)	-0.296; 0.192	1.000	0.179 (0.321)	-0.451; 0.809	1.000	-0.097 (0.332)	-0.747; 0.557	1.000
Employed	527 (6)	0.107 (0.148)	-0.184; 0.395	1.000	-0.789 (0.416)	-1.604; 0.026	0.173	-0.484 (0.398)	-1.270; 0.294	0.674
Current treatment	1036 (6)	0.123 (0.104)	-0.081; 0.327	0.717	-0.094 (0.268)	-0.620; 0.431	1.000	-0.680 (0.277)	-1.227; -0.138	0.043
Alcohol use	225 (3)	-0.023 (0.038)	-0.097; 0.051	1.000	[f]			-0.025 (0.100)	-0.222; 0.172	1.000
Human support during intervention	1216 (9)	-0.025 (0.101)	-0.223; 0.173	1.000	0.190 (0.258)	-0.317; 0.696	1.000	0.243 (0.260)	-0.266; 0.756	1.000
Treatment dose (No. of modules)	1216 (9)	0.001 (0.037)	-0.072; 0.073	1.000	-0.099 (0.104)	-0.302; 0.105	1.000	-0.029 (0.093)	-0.214; 0.154	1.000
Treatment dose (weeks)	1216 (9)	-0.047 (0.042)	-0.129; 0.035	0.783	0.027 (0.119)	-0.206; 0.260	1.000	-0.055 (0.106)	-0.266; 0.151	1.000
Type of control group	1216 (9)	0.207 (0.119)	-0.027; 0.440	0.247	-0.710 (0.326)	-1.349; -0.072	0.088	-0.839 (0.320)	-1.469; -0.211	0.026

Note: These analyses are based on the complete observations (not imputed). p-values have been corrected for multiple testing across the three indices of suicidal ideation using the Bonferroni correction term; corrected p-values >1.000 have been rounded to 1.000. The confidence intervals have not been corrected. For moderators, the treatment × moderator interaction is displayed. [a]RCI: categorized reliable change index per person (improvement, no change, deterioration). [b]n (k): total number of participants included in the respective analyses (number of studies). [c]b (SE): b coefficient (standard error). [d]95% CI: 95% confidence interval. [e]The moderator depressiveness in the response rate model was modeled as a random effect as indicated in model comparisons; all other moderators were modeled as fixed effects. [f]This model (alcohol use/reliable changes) did not converge.

Severity of suicidal ideation controlled for baseline suicidal ideation

	Severity of suicidal ideation (imputed data)				Severity of suicidal ideation (complete case analyses)			
	n (k)[a]	**b (SE)[b]**	**95% CI[c]**	**p**	**n (k)[a]**	**b (SE)[b]**	**95% CI[c]**	**p**
Effects on severity of suicidal ideation								
Treatment effect at post-intervention	2037 (9)	-0.242 (0.037)	-0.314; -0.171	<0.001	1216 (9)	-0.254 (0.047)	-0.346; -0.162	<0.001
Treatment effect at follow-up	891 (4)	-0.214 (0.053)	-0.317; -0.111	<0.001	321 (4)	-0.192 (0.086)	-0.360; -0.023	0.078
Moderator analyses								
History of suicide attempts	1850 (6)	-0.096 (0.077)	-0.246; 0.054	0.625	1084 (6)	-0.181 (0.098)	-0.373; 0.010	0.193
Depressiveness	1980 (8)	0.013 (0.032)	-0.051; 0.076	1.000	1146 (8)	0.020 (0.044)	-0.065; 0.106	1.000
Hopelessness	1785 (5)	-0.069 (0.032)	-0.132; -0.006	0.098	1006 (5)	-0.053 (0.043)	-0.137; 0.032	0.669
Anxiety	1516 (5)	-0.085 (0.038)	-0.161; -0.010	0.080	730 (5)	-0.117 (0.055)	-0.225; 0.000	0.102
Worrying	1369 (4)	0.001 (0.003)	-0.006; 0.007	1.000	795 (4)	0.000 (0.004)	-0.009; 0.008	1.000
Age	1907 (7)	0.000 (0.003)	-0.005; 0.006	1.000	1135 (7)	0.000 (0.004)	-0.007; 0.007	1.000
Female gender	2019 (9)	0.003 (0.079)	-0.153; 0.158	1.000	1207 (9)	-0.028 (0.103)	-0.229; 0.173	1.000
Secondary education or higher	1872 (7)	0.049 (0.135)	-0.216; 0.314	1.000	1039 (7)	0.010 (0.165)	-0.315; 0.330	1.000
Married/living with partner	1616 (5)	-0.042 (0.092)	-0.222; 0.139	1.000	848 (5)	-0.038 (0.121)	-0.275; 0.200	1.000
Employed	710 (6)	0.112 (0.129)	-0.140; 0.364	1.000	527 (6)	0.090 (0.143)	-0.191; 0.369	1.000
Current treatment	1829 (6)	0.105 (0.078)	-0.048; 0.258	0.539	1036 (6)	0.161 (0.102)	-0.038; 0.361	0.345
Alcohol use	558 (3)	-0.015 (0.025)	-0.063; 0.034	1.000	225 (3)	-0.023 (0.035)	-0.091; 0.044	1.000
Human support during intervention	2037 (9)	0.007 (0.086)	-0.163; 0.176	1.000	1216 (9)	-0.021 (0.099)	-0.214; 0.172	1.000
Treatment dose (No. of modules)	2037 (9)	0.018 (0.030)	-0.040; 0.077	1.000	1216 (9)	0.007 (0.036)	-0.064; 0.077	1.000
Treatment dose (weeks)	2037 (9)	-0.015 (0.033)	-0.080; 0.049	1.000	1216 (9)	-0.014 (0.041)	-0.094; 0.067	1.000
Type of control group	2037 (9)	0.224 (0.088)	0.052; 0.397	0.032	1216 (9)	0.241 (0.116)	0.013; 0.468	0.115

Note: p-values have been corrected for multiple testing across the three indices of suicidal ideation using the Bonferroni correction term; corrected p-values >1.000 have been rounded to 1.000. The confidence intervals have not been corrected. For moderators, the treatment × moderator interaction is displayed. [a]n (k): total number of participants included in the respective analyses (number of studies). [b]b (SE): b coefficient (standard error). [c]95% CI: 95% confidence interval.

Explorative predictor analyses for treatment adherence (complete observations)

	n (k)[a]	b	SE[b]	95% CI[c]
Suicidal ideation	484 (5)	0.035	0.041	-0.046; 0.116
History of suicide attempts	411 (3)	-0.020	0.034	-0.087; 0.046
Depressiveness	455 (4)	0.002	0.016	-0.030; 0.034
Hopelessness	410 (3)	-0.002	0.017	-0.035; 0.033
Anxiety	252 (2)	-0.019	0.022	-0.053; 0.029
Age	439 (4)	-0.001	0.001	-0.003; 0.002
Female gender	483 (5)	0.086	0.036	0.015; 0.156
Secondary education or higher	463 (5)	-0.038	0.057	-0.148; 0.075
Married/living with partner	438 (4)	0.048	0.036	-0.024; 0.117
Employed	221 (5)	-0.016	0.055	-0.130; 0.090
Current treatment	432 (4)	0.013	0.035	-0.056; 0.080
Human support during intervention	486 (5)	0.228	0.040	0.157; 0.310

Note: These analyses are based on complete observations (unimputed). [a]n (k): total number of participants included in the respective analysis (number of studies). [b]SE: standard error. [c]95% CI: 95% confidence interval.

eResults 2: Risk of bias

Cochrane Risk of Bias Tool 2 (study-level)

Study	Bias arising from the randomization process	Bias due to deviations from intended interventions	Bias due to missing outcome data	Bias in selection of the outcome
Batterham 2018	Low	Low	**High**	**Some concerns**
De Jaegere 2019	Low	Low	**High**	**Some concerns**
Hill 2019	Low	Low	Low	**Some concerns**
Mühlmann 2021	Low	Low	Low	Low
Van Spijker 2014	Low	Low	Low	Low
Van Spijker 2018	**Some concerns**	Low	**High**	Low
Wilks 2018	Low	**High**	**High**	**Some concerns**
Tighe 2017	Low	**High**	Low	**Some concerns**
Eylem 2021	Low	**High**	**High**	**High**
Hetrick 2017	Low	Low	**High**	Low

Cochrane Risk of Bias Tool 2 (IPD-level: adapted for information from individual participant data)

Study	Bias arising from the randomization process	Bias due to deviations from intended interventions	Bias due to missing outcome data	Bias in selection of the outcome
Batterham 2018	Low	Low	**High**	Low
De Jaegere 2019	Low	Low	**High**	Low
Hill 2016	Low	Low	Low	Low
Mühlmann 2021	Low	Low	Low	Low
Van Spijker 2014	Low	Low	Low	Low
Van Spijker 2018	**Some concerns**	Low	**High**	Low
Wilks 2018	Low	**High**	**High**	Low
Tighe 2017	Low	**High**	Low	Low
Eylem 2021	Low	Low	**High**	Low

Additional information from individual participant data:

Beyond the Cochrane Risk of Bias 2 domains, the range was restricted to mild to moderate suicidal ideation in most trials. However, individuals with mild to severe ideation were included in three trials,[4–6] and these trials provided about 75% of the IPD sample, leading to a low risk of bias due to range restrictions. The variances were judged to be mostly appropriate; in two samples, they were low due to range restrictions.[7,8] Bias due to sample composition was also low, as the sample is judged to be mostly appropriate from a clinical point of view. The overall sample includes individuals with mild to severe suicidal ideation, with and without a history of suicide attempts, and participants of all ages. Individuals <18 years were underrepresented. Although some trials recruited specific subsamples of individuals with suicidal ideation (i.e., Turkish migrants, indigeneous youth, heavy episodic drinkers, school students), the majority of the sample was not restricted to specific subgroups of the general population. Participants were mostly self-referred.

eResults 3: Quality of evidence ratings

GRADE ratings for self-reported severity of suicidal ideation at post-intervention

GRADE criteria	Rating	Reasons for down-or upgrading	Quality of evidence
Risk of Bias	Very serious concerns (-2)	38.4% missing data, differences in dropout rates in iCBT vs. control conditions, risk of attrition bias in 5 out of 9 trials. 7 out of 9 trials were waitlist controlled, which might lead to overestimated effect sizes.	⊕⊕⊖⊖
Inconsistency	No concerns	Statistical model comparisons showed that modeling a fixed treatment effect was appropriate, suggesting that statistical heterogeneity was low.	
Indirectness	No concerns	Mostly adult population. Mostly self-referred participants. Delivery via smartphone app in only one study.	
Imprecision	No concerns	>2000 participants in total. Pooled effect size and CIs indicate a small effect size (b=-0.247; 95% CI: -0.322 to -0.173; p<0.001).	
Publication Bias	No concerns	Funnel plot did not indicate risk of publication bias. Small and large trials with non-significant results included. IPD coverage rate 90%; aggregated meta-analysis did not yield different results.	

Note. ⊕⊕⊕⊕ = high, ⊕⊕⊕⊖ = moderate, ⊕⊕⊖⊖ = low, ⊕⊖⊖⊖ = very low. Included studies: Batterham et al. (2018); de Jaegere et al. (2021); Hill & Pettit (2016); Mühlmann et al. (2021); van Spijker et al. (2014); van Spijker et al. (2018); Wilks et al. (2018); Tighe et al. (2017); Eylem et al. (2021).

GRADE ratings for self-reported severity of suicidal ideation at follow-up

GRADE criteria	Rating	Reasons for down-or upgrading	Quality of evidence
Risk of Bias	Very serious concerns (-2)	60.0% missing data, higher dropout in iCBT, risk of attrition bias in 3 out of 4 trials. 3 out of 4 trials were waitlist controlled.	⊕⊖⊖⊖
Inconsistency	No concerns	Statistical model comparisons showed that modeling a fixed treatment effect was appropriate, suggesting that statistical heterogeneity was low.	
Indirectness	Serious concerns (-1)	3 out of 4 trials on adult population. Self-referred participants. Only 1 trial with a guided intervention (2% of participants). 1 trial (de	

		Jaegere) makes up 80% of the participants of the IPD.	
Imprecision	Serious concerns (-1)	>800 participants in total. Pooled effect size and CIs indicate a very small effect size; lower CI close to no effect (b=-0.189; 95% CI: -0.296 to -0.083; p=0.001).	
Publication Bias	Undetected (insufficient number of studies)	Small and large trials with non-significant results included. IPD coverage rate 80%.	

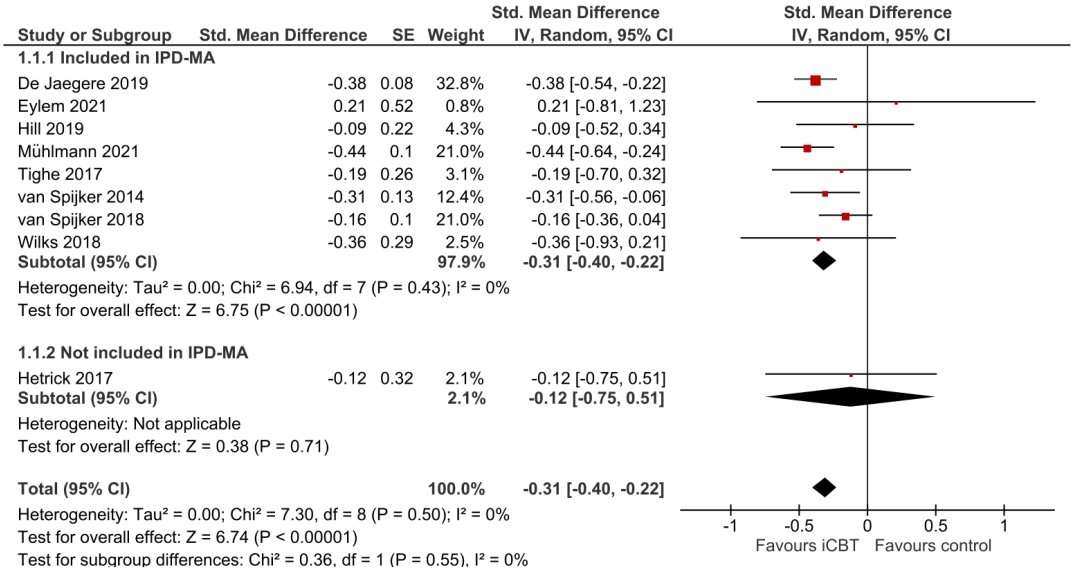
Note. ⊕⊕⊕⊕ = high, ⊕⊕⊕⊖ = moderate, ⊕⊕⊖⊖ = low, ⊕⊖⊖⊖ = very low. Included studies: Batterham et al. (2018); de Jaegere et al. (2021); Hill & Pettit (2016); Eylem et al. (2021).

GRADE Ratings for suicide attempts until post-intervention

GRADE criteria	**Rating**	**Reasons for down-or upgrading**	**Quality of evidence**
Risk of Bias	Very serious concerns (-2)	Only 3 trials reported data; >40% missing data, missing-at–random assumption violated, complete case analysis. Self-reported suicide attempts (hospital-registered in only one trial) are at high risk of attrition bias; low data quality: extracted from single items of questionnaires in 1 trial.	⊕⊖⊖⊖
Inconsistency	No concerns	Statistical model comparisons showed that modeling a fixed treatment effect was appropriate, suggesting that statistical heterogeneity was low.	
Indirectness	No concerns	Only adults included. Self-referred participants.	
Imprecision	Very serious concerns (-2)	864 included participants (complete cases). Highly imprecise estimate (b=0.091; 95% CI: -0.440 to 0.617; p=0.734). CIs include both a substantial reduction and increase of suicide attempts.	
Publication Bias	Undetected (insufficient number of studies)	Suicide attempts were not the primary outcome of included trials. Trials were not powered to detect potential effects.	

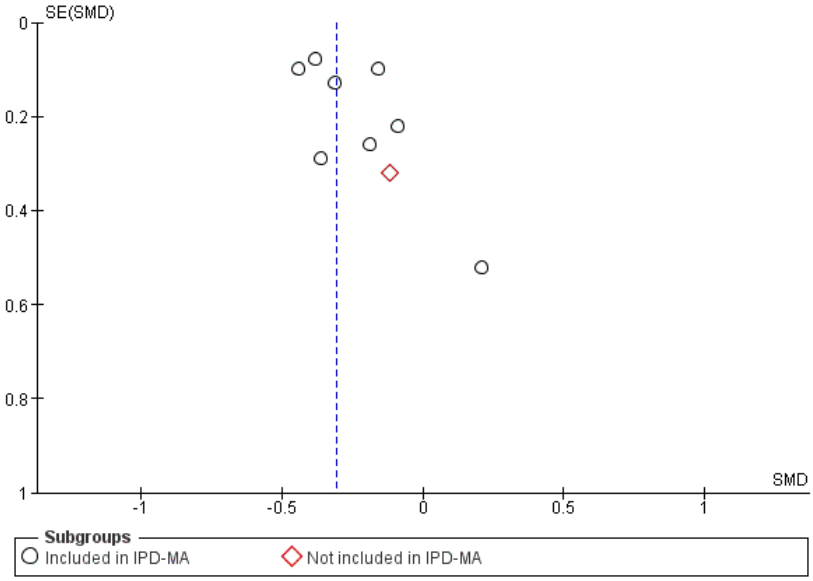
Note. ⊕⊕⊕⊕ = high, ⊕⊕⊕⊖ = moderate, ⊕⊕⊖⊖ = low, ⊕⊖⊖⊖ = very low. Included studies: Mühlmann et al. (2021); de Jaegere et al. (2019); van Spijker et al. (2018).

eFigure 1: Meta-analysis of aggregated data



Note: Effectiveness of iCBT on suicidal ideation at post-intervention. Aggregated data by Batterham et al. (2018) could not be included because only a subsample received an eligible intervention.

eFigure 2: Funnel plot



Note: Negative standardized mean difference (SMD) indicates a reduction of suicidal ideation in iCBT conditions compared to controls. The blue line represents the effect estimate.

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