

The Phenomenon of Treatment Dropout, Reasons and Moderators in Acceptance and Commitment Therapy and Other Active Treatments: A Meta-Analytic Review

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Abstract

Background: Treatment dropout is one of the most crucial issues that a therapist has to face on a daily basis. The negative effects of premature termination impact the client who is usually found to demonstrate poorer treatment outcomes. This meta-analysis reviewed and systematically examined dropout effects of Acceptance and Commitment Therapy (ACT) as compared to other active treatments. The goals of this study were to compare treatment dropout rates and dropout reasons, examine the influence of demographic variables and identify possible therapy moderators associated with dropout.

Method: The current meta-analysis reviewed 76 studies of ACT reporting dropout rates for various psychological and health-related conditions.

Results: Across reviewed studies ($N = 76$), the overall weighted mean dropout rate was 17.95% (ACT = 17.35% vs. comparison conditions = 18.62%). Type of disorder, recruitment setting and therapists' experience level were significant moderators of dropout. The most frequently reported reasons for dropout from ACT were lost contact, personal and transportation difficulties, whereas for comparative treatments they were lost contact, therapy factors and time demands.

Conclusion: Given that most moderators of influence are not amenable to direct changes by clinicians, mediation variables should also be explored. Overall, results suggest that ACT appears to present some benefits in dropout rates for specific disorders, settings and therapists.

Keywords

acceptance and commitment therapy, dropout, attrition, meta-analysis, premature termination



Highlights

- There was no difference in dropout rate between ACT and control conditions (17.35% vs.18.62%). Significant moderators were client disorder, therapists' experience level and recruitment and setting.
- Comparison condition frequently reported therapy related dropout factors, suggesting that ACT may be a more acceptable option.

Acceptance and Commitment Therapy (ACT), is a so-called third wave Cognitive Behavior Therapy (CBT) and has been applied successfully to treat numerous problems and disorders (Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Ruiz, 2012). ACT helps clients choose to do what takes them closer to their goals (especially when dealing with problematic thoughts and emotions) rather than aiming to reduce symptoms directly (Hayes, Hayes, Strosahl, & Wilson, 2012). The focus is placed on the experience of the person and the function of any behavior rather than on actions being carried out based on the literal content of a belief (Hayes et al., 2006). The overall aim of treatment is to increase psychological flexibility or the ability to fully contact the present moment, choosing to act guided by the person's values in the context at hand (Fletcher & Hayes, 2005). Most existing reviews and meta-analyses of ACT support that it is at least as equally effective as traditional Cognitive Behavioral Therapy (tCBT) on indices of symptom reduction and more effective than other comparison conditions (A-Tjak et al., 2015; Powers, Vörding, & Emmelkamp, 2009; Ruiz, 2012).

Treatment outcomes and effectiveness, however, are affected not only by the specific treatment provided but also by other factors such as premature termination/dropout or non-completion of the specified interventions (Barrett, Chua, Crits-Christoph, Gibbons, & Thompson, 2008). Premature therapy termination or treatment dropout is a significant problem or obstacle limiting the effectiveness of any therapeutic approach and results in detrimental outcomes in patients (Barrett et al., 2008; Wierzbicki & Pekarik, 1993). Unfortunately, there is no consensus definition about what constitutes treatment dropout. General definitions of dropout include: termination of the intervention prior to the patient recovering from the problem(s) for which treatment was initially sought (Hatchett & Park, 2003; Swift, Callahan, & Levine, 2009), or treatment termination without the agreement of the therapist and before the scheduled end point (Stone & Rutan, 1984). However, in research protocols premature termination may be considered as missing a number of pre-arranged sessions (e.g., four consecutive weeks in DBT; Linehan, 1993) irrespective of the patient's recovery status.

Reviews and meta-analyses of this phenomenon focus on examining first the rates of dropout and, secondly, variables associated with its occurrence. Swift and Greenberg (2012) examined dropout definition as a moderator of dropout rates and found higher rates when the therapist judged dropout status, compared to other definitions. This was

one of the first comprehensive reviews of the dropout phenomenon encompassing various forms of psychotherapy and concluded that 1 in 5 clients drop out prematurely, a rate somewhat lower than previous reviews (e.g., [Wierzbicki & Pekarik, 1993](#)). Client diagnosis, age, education, gender, marital status, time-limitations of treatment, use of manual or protocol, treatment setting, providers' level of experience, dropout definition, study type and search strategy were found to be significant moderators of dropout. However, this meta-analysis did not include studies of third wave psychological treatments, like ACT. Moreover, it focused only on adult populations and did not include substance or alcohol abuse disorders, health-related problems (e.g., weight management, emotional burnout), and self-help interventions. Finally, it focused on providing a broad analysis of premature discontinuation in psychological treatments and not on reasons for dropout.

This study aims to examine the dropout phenomenon in ACT (compared to other active interventions) because of ACT's emphasis on connecting clients with their deeply held values and through this process to motivate them towards behavior change. If ACT is successful in mobilizing individuals via the treatment process, we expect that this would prevent premature termination and thus ACT would result in lower dropout rates compared to other interventions. To date, only one meta-analysis on dropout has included ACT ([Ong, Lee, & Twohig, 2018](#)). This study found that only therapist experience significantly predicted dropout, specifically that when ACT was provided by master's level therapists higher dropout rates were observed, compared to other levels of therapists' experience (e.g., PhD level psychologist, MD physician, graduate student). However, understanding dropout in ACT can be further facilitated in four important ways. First, inclusion of variables found to predict dropout in previous meta-analyses (e.g., gender, race, marital status, employment and years of education) will allow for comparison across studies and methods (e.g., [Swift & Greenberg, 2012](#)). Second, inclusion of variables that assess how the therapy and study were implemented (e.g., length of intervention, hours of intervention, setting, definition of dropout, study type, year of publication and region) can reveal clues as to how interventions can actively minimize dropout. Third, testing the reasons and timing of dropouts provides hypotheses for researchers and therapists to actively intervene to prevent this phenomenon of paramount clinical significance. Finally, some methodological details regarding comparison groups are worthy of reexamination. For example, we believe that including waitlist control conditions in the comparisons may bias the dropout findings in favor of waitlist control. This is because people on the waitlist are fundamentally different to patients in a control condition. In the waitlist, patients usually maintain hope that things will get better once the treatment begins and are not motivated to actively change during the waiting period. When clients do drop out during this period, by definition it has nothing to do with the active treatment. Thus a cleaner comparison of treatment dropout should be carried out between different active treatments (including active controls). Towards this goal, comparative conditions should be other active interventions.

A minority of patients may drop out because they improved or met their goals; however numerous individuals drop out because of a problem with the treatment or therapists or for other unforeseen circumstances. Specifically, proposed problems or reasons associated with increased dropout rates include: client demographic characteristics (e.g., younger age, female gender, low socioeconomic status; [Wierzbicki & Pekarik, 1993](#)); type of psychopathological difficulties (e.g., eating or personality disorders); therapist characteristics (e.g., provider in training); therapy setting (e.g., university-based clinics); and specific factors (e.g., non-time limited therapy), and environmental variables or acute problems that take greater priority ([Bados, Balaguer, & Saldaña, 2007](#); [Roe, Dekel, Harel, & Fennig, 2006](#); [Swift & Greenberg, 2012](#)).

Researching these reasons is difficult as variables and methods vary widely depending on the study and its focus, the population studied, the treatment setting or the treatment offered ([Roe et al., 2006](#); [Todd, Deane, & Bragdon, 2003](#)). However, there is an agreement that certain common reasons account for dropout. These include: lack of improvement or accomplishment of goals, dissatisfaction with the treatment, and environmental obstacles and constraints ([Hunsley, Aubry, Verstervelt, & Vito, 1999](#); [Pekarik, 1992](#); [Roe et al., 2006](#); [Todd et al., 2003](#)). In addition to common factors, clients report specific reasons for discontinuation, including: external circumstantial problems and difficulties (e.g., transportation problems, moving away, timetables), illness and new responsibilities, improvement due to therapy, satisfactory achievement of treatment goals, high treatment costs, dissatisfaction with the therapist and psychotherapy, no need for services and need for independence and trying to solve problems without therapy ([Bados et al., 2007](#); [Roe et al., 2006](#); [Todd et al., 2003](#)).

Interestingly, very little attention has been given to the timing during treatment when premature termination occurs and most studies do not even report this information. Some have proposed that the first two sessions are critical for premature termination, given that most dropouts (70%) occur at this point, making it a critical period to successfully engage the client in treatment ([Olfson, Mojtabai, Sampson, Hwang, & Kessler, 2009](#)). [Karekla \(2004\)](#) observed that in a comparison trial of CBT vs. ACT for panic disorder, though dropout rates between the two approaches were similar, most individuals who dropped out in the CBT condition did so immediately after the introduction of exposure. Such a pattern was not evident for the ACT group, where individuals dropped out at various times during treatment unrelated to specific treatment components. It was concluded that ACT might present an advantage over CBT not in terms of symptom reduction but that it may better prepare individuals to engage in exposure of previously avoided internal and external events and in dealing with the dropout problem. To date, none of the reported reviews or meta-analyses of ACT have examined in depth dropout, dropout reasons, extensive list of moderators, and compared to active treatments.

Current Study

The purpose of this study is to examine dropout rates, dropout reasons' associated factors, and potential moderators of dropout, in ACT compared to active comparison conditions. The goals of this study were to: (i) compare treatment dropout rate and timing between ACT and other active treatments; (ii) examine the influence of demographic variables such as age, gender, treatment setting, race, education, duration of treatment, ethnicity and diagnosis on dropout; (iii) identify possible therapy-associated moderators of dropout; and (iv) examine timing and possible reasons for dropout.

Method

This review was registered in the International Prospective Register of Systematic Reviews (see [Supplementary Materials](#)).

Literature Search

The literature search was conducted using the computerized literature databases Google Scholar, EBSCOhost (Academic Search Ultimate, Medline, Psychology and Behavioral Sciences Collection, PsycARTICLES, PsychInfo, OpenDissertations) and Science Direct (until June 2018) with the following keywords based on title: "Acceptance and Commitment Training", "Acceptance-based behavior therapy", "ACT-based", "Experiential avoidance", "Psychological flexibility", "RFT-based", "CBS-based", "Third wave CBT therapies" "Acceptance and Commitment Therapy", and "ACT"; alone first and then also combined with the terms "drop out" or "dropout" or "discontinuation" or "outcome" or "premature termination" or "termination". The reference lists of all identified articles were examined for additional potentially eligible studies, as well as existing meta-analyses and reviews. A request for unpublished studies was sent to the Acceptance and Commitment Therapy (ACT) listserv (https://contextualscience.org/emailing_lists), as well as to the primary or secondary authors of identified articles, via email.

Eligibility Criteria

Identification and selection of the included studies was performed by the second author, a clinical psychology doctoral student, who was first trained and instructed in the procedure of conducting meta-analysis by the first and last authors. Everything was checked by the first author. The last three authors all have experience in meta-analysis and served to check all steps taken in the process of this study.

This study includes all published and unpublished (e.g., dissertation) Acceptance and Commitment Therapy studies that included dropout information and met the following criteria. Studies were included if they: (1) were in English, (2) reported dropout rates after beginning psychotherapy or reported no dropouts (i.e., all participants completed treat-

ment), and (3) used an active comparison condition. Studies were excluded if: (a) data originated from the same sample as another included study (so as to avoid violating the meta-analytic assumption of data independence); (b) information to calculate effect sizes was lacking and contact with authors was not possible; and (c) case studies.

The literature search resulted in 4399 articles in total. After screening the titles and abstracts, and following the examination of the full papers, 76 studies met all aforementioned inclusion criteria and were retained for analysis (see [Figure 1](#) for procedure details). Based on the Rosenthal's suggestions for computing the fail-safe n , it was found that the total Z value was -1.181 and the number of missing studies we would need to retrieve and incorporate to result in a non-significant p -value was 147 studies (see also [Borenstein, Hedges, Higgins, & Rothstein, 2009](#)).

Coding Procedures

Treatment dropout was defined as the percentage of patients who began treatment, but according to the author(s) dropped out prematurely, thus utilizing the author(s)' definition. For reliability and validity purposes we included only studies that reported dropout rates during treatment and not prior to treatment initiation.

Participant, therapist, treatment and study characteristics were coded (see [Table 1](#) for details about coding of each of the variables). Eight participant characteristics included: client disorder, gender, age, race, marital status, employment, years of education and population. Eight treatment variables were comparison condition, treatment status, length of intervention, length of intervention in sessions, hours of intervention, format of treatment, treatment setting and description of treatment setting (as per [Swift & Greenberg, 2012](#)). Two treatment provider variables regarding experience level: 1) experience level of ACT therapists, and 2) experience level of therapists in comparison groups. Finally, four study variables included: definition of dropout, study type, year of publication and region.

The second and third authors coded all variables separately and these were checked for accuracy by the first authors. There was a 95% agreement rate between coders with disagreements resolved via a consensus among the authors (for further coding details contact the authors).

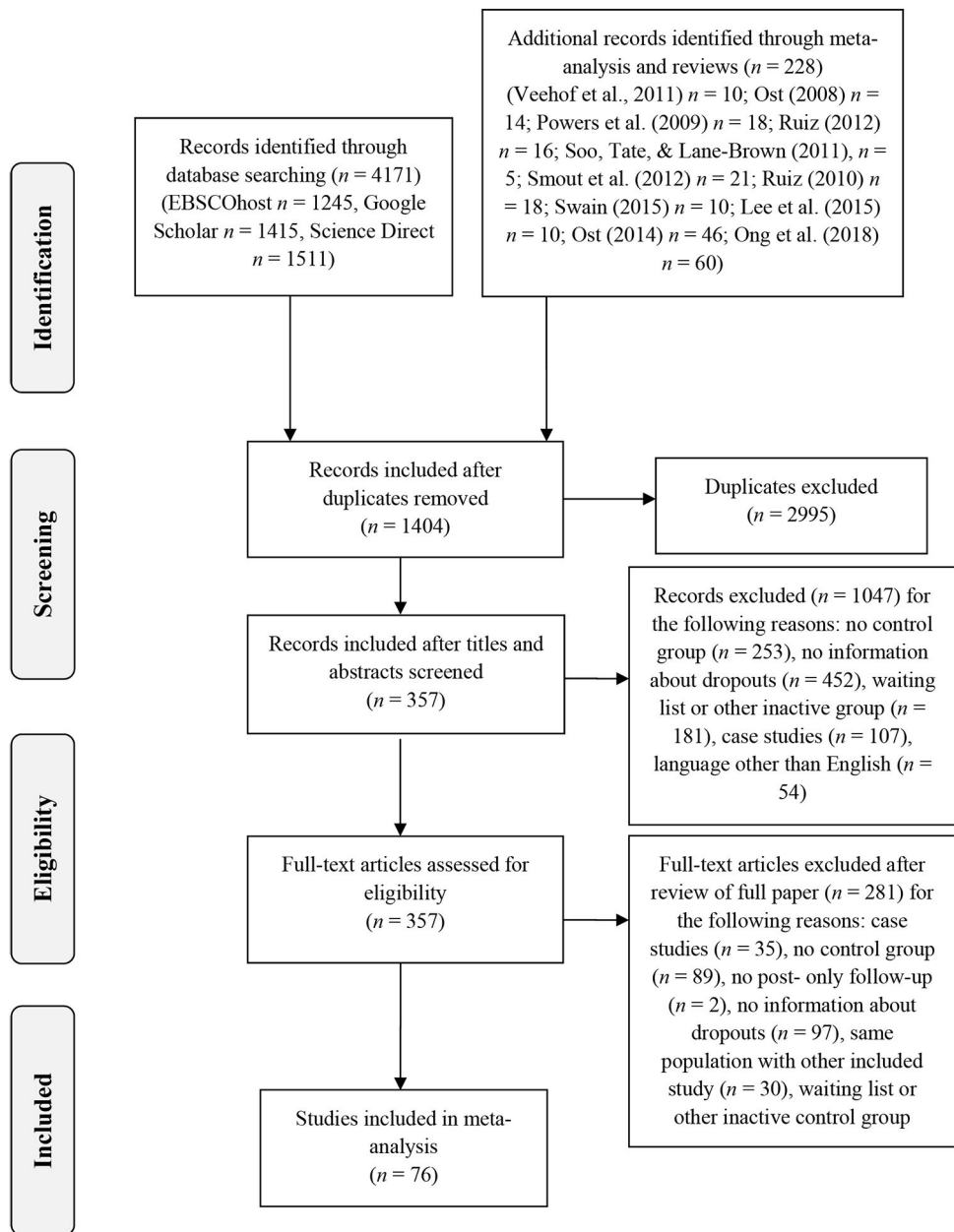


Figure 1. Flow chart of information from identification to inclusion of studies in this review.

Table 1

Details Regarding the Coding of Each of the Variables

Participant characteristics	
Client disorder	Anxiety disorder (including social phobia, public speaking anxiety, generalized anxiety disorder and obsessive compulsive disorder), depression, substance abuse or dependence, chronic pain (including fibromyalgia, osteoarthritis and headaches), eating pathology/disorder (including diabetes, obesity, weight problems and eating disorders), health conditions and chronic illnesses (i.e. Parkinson's disease, multiple sclerosis, brain injury, cancer and HIV), smoking, other health problems (stress, distress, physical activity, tinnitus, procrastination and sickness absence) and severe psychopathology (including borderline personality disorder, treatment resistant and psychosis)
Gender	Percentage of female participants in each study
Age	Average age in years of participants in each sample
Race	Percentage of White (including Caucasian, Australian and European), Black (including African American) and other (Hispanic, Latino, Asian American/ Pacific Islander, Native American, Alaskan American and American Indian/ Alaskan native)
Marital status	Percentage of participants who were single (non-married, never married, divorced, separated or widowed) vs. married (cohabiting, living with partner/spouse/family or in a relationship)
Employment	Percentage of participants who were working, either full-time or part-time
Years of education	Participants' average number of completed education years in each study. In cases where the mean number of education in years was not provided, we calculated this based on the data reported.
Population	Adults or children and adolescents
Treatment variables	
Comparison condition	CBT, Treatment as Usual (TAU; studies in which TAU consisted of only administering medication were coded as medication only) (i.e., Medication Treatment as Usual plus Enhanced Assessment and Monitoring, Recommended Pharmacological Treatment, Specialty Medical Management, Methadone maintenance, Selective Serotonin Reuptake Inhibitors, Medical Treatment as Usual, Nicotine Replacement Treatment and Bupropion Regimen), other active treatment (i.e., Narcotics Anonymous, Applied Behavior Analysis, smokefree.gov, online discussion forum, usual care, counseling services, Workplace Dialogue Intervention, Present-Centered Therapy, physical exercise, Drug Counseling, Tinnitus Retraining Therapy and Expressive writing), component of CBT (including Progressive Relaxation Training, Systematic Desensitization, Applied Relaxation, Cognitive Therapy, Stress Inoculation Training, Relaxation Training) and education only (education, Befriending, Pedometer-based walking program)
Treatment status	Providing any treatment/training to the comparison condition or not
Length of intervention	Total length of treatment in weeks (in cases where months were reported, each month was calculated to equal 4 weeks)
Length of intervention in sessions	Total number of treatment sessions
Hours of intervention	The overall duration of intervention in hours
Format of treatment	Individual, self-help (including web-based and online format), group, or combination (group & individual)
Treatment setting	Outpatient, inpatient or self-help (including web-based and online format)
Description of treatment setting	University affiliated clinic (psychology department training clinic and university counseling center), outpatient clinic affiliated with a hospital or medical school, public/community outpatient clinic, research/specialty clinic, private outpatient clinic/practice, therapy took place at participant's home (i.e., web-based/online intervention or self-help) and inpatient or residential treatment

Treatment provider variables

Experience level of ACT therapists	Master level therapists or doctoral students/interns/residents, doctoral level or licensed therapists, mix of doctoral level, student trainees, and others (e.g., licensed clinicians, psychiatrists, social workers, psychiatric nurses), no therapists (i.e., for online/web-based or self-help formats), mix of different psychologist levels and non-psychologists (e.g. drug staff, alcohol counselor, physician, psycho-pharmacologist)
Experience level of therapists in comparison groups.	Master level therapists or doctoral students/interns/residents, doctoral level or licensed therapists, mix of doctoral level, student trainees, and others (e.g., licensed clinicians, psychiatrists, social workers, psychiatric nurses), no therapists (i.e. it was applicable for online/web-based or self-help formats), mix of different psychologist levels, psychiatrists and non-psychologists (e.g. drug staff, alcohol counselor, physician, psycho-pharmacologist).

Study variables

Definition of dropout	Failed to complete treatment/discontinued treatment/left before treatment end, or refused to return to treatment, failed to attend all sessions, failed to submit pre and post treatment data and attended less than or equal to either: 25-40%, 50-75% or 76-90% of total sessions
Study type	Efficacy (i.e., studies that emphasize internal validity) or effectiveness (i.e., emphasize external validity of the experimental design). If the study type was not specifically reported, efficacy was coded as studies utilizing: (a) strict exclusion criteria, (b) careful pre-selection of clients, (c) treatment following a strict protocol and was more controlled than effectiveness studies, (d) randomization of participants to treatments, and/or (e) therapists receiving training before and supervision during the study

Year of publication

Region	In which each study was conducted
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Data Analysis

First, the dropout rate for each study condition (ACT vs. comparison group) was calculated (i.e., the total number of patients who dropped out of each treatment group, out of the total number of patients included in each group). Then, the weighted average dropout rate (i.e., weighted dropout rate for each study condition based on the total number of patients included in the study) was computed for each of the 76 included studies. The number of participants dropped from each group was included in the Comprehensive Meta-Analysis software (CMA; version 2.0, Biostat, Englewood, NJ), along with the sample size of each group (treatment and comparison). Odds ratio was then computed. Odds ratios higher than 1 suggest that dropout rates are higher in the intervention versus the comparison condition (i.e., comparison group is better).

Random-effects models were used to estimate the effect size of rate ratio in the included studies, as the assumptions of random-effect models suggests that study characteristics influence the true effect of treatments, and that sampling error varies between studies (DerSimonian & Kacker, 2007). The Q statistic and the I^2 statistic were calculated. Random-effects models are considered appropriate when there is significant heterogeneity ($p < .05$) according to the Q index, and when heterogeneity is high ($>75\%$) based on the I^2 index.

First, an unconditioned model without having any predictors or moderators was calculated using CMA, in order to detect the general rate ratio of dropouts between treat-

ment and comparison conditions. In order to examine if the results of the general model were subject to biases related to the publication of studies with favorable outcomes, publication bias was investigated by assessing the asymmetries evident in a funnel plot, with the Egger's regression test (Egger, Smith, Schneider, & Minder, 1997) and the Begg and Mazumdar test (Kendall's statistic). A stratified subgroup analyses was then run in order to test the moderating role of categorical study characteristics and meta-regression analyses to test the moderating role of continuous study characteristics. Q statistic was calculated for the subgroup analyses, in order to examine if the differences detected between the mean effect sizes of the groups of studies with a particular characteristic were significant. The meta-regression analyses were computed using a general mixed-effects method-of-moments (Kacker, 2004) estimate for the inter-study variance τ^2 (DerSimonian & Kacker, 2007).

Results

Characteristics of Reviewed Studies

All identified studies were included in the meta-analysis; no structured qualitative assessment of the reviewed articles was performed. The large majority of included studies employed a randomized controlled trial design, or at least a controlled trial design. This suggests that all studies are at least of a moderate methodological quality (Petrisor & Bhandari, 2007), and attempted to compare ACT to an active treatment comparison condition.

See Table 2 for characteristics of included studies. Most studies dealt with the treatment of anxiety ($n = 14$, 18.4%) and chronic pain ($n = 14$, 18.4%); and targeted adults ($n = 73$, 96.1%) using a group treatment format ($n = 34$, 44.7%). ACT was compared mostly with TAU ($n = 17$, 22.4%) and CBT ($n = 17$, 22.4%). Most studies were delivered in an outpatient setting ($n = 60$, 78.9%) and participants were most frequently recruited via community advertisements ($n = 21$, 27.6%). Treatment in ACT groups was delivered mostly by psychologists of various training levels ($n = 19$, 25%) and licensed or doctoral level psychologists ($n = 15$, 19.7%). In comparison group treatment was provided mostly by a mix of doctoral level, student trainees and others ($n = 15$, 19.7%) and a mix of psychologists with different training levels ($n = 13$, 17.1%). The most frequent definition of dropout was "failed to complete treatment, left treatment prior to its end, or refused to return to treatment" ($n = 53$, 69.7%). Finally, efficacy-type studies ($n = 42$, 55.3%) were more than effectiveness-type studies ($n = 34$, 44.7%).

Table 2

Characteristics of Studies Included in the Meta-Analysis (N = 76)

Study & Region	Disorder	N	Control group(s)	% dropout		Mean Age	% female	Setting	Format	Tx weeks
				ACT	control group(s)					
Abad et al. (2016); Asia	Cancer	36	CBT	0.00	16.66	NI	100	O	G	NI
Alonso-Fernández et al. (2016); Europe	CP	101	MS	43.40	29.17	83	78	O	G	9
Arch et al. (2012); US	Anxiety	128	CBT	35.09	32.39	38	52	O	Ind	12
Avdagic, Morrissey, & Boschén (2019); Australia	GAD	51	CBT	12.00	23.08	36	67	O	G	6
Azkhosh et al. (2016); Asia	Substance Abuse	60	Narcotics Anonymous	20.00	15.00	27	NI	O	I	12
Bethay et al. (2013); US	Intellectual Disability	34	ABA	10.00	11.11	38	77	O	G	3
Bricker et al. (2013); US	Smoking	222	Smokefree.gov	45.95	46.85	45	62	S	S	3
Buhrman et al. (2013); Europe	CP	76	Online Discussion Forum	15.79	15.79	49	59	S	S	7
Butryn et al. (2011); US	Physical activity	54	Education	20.00	5.26	23	100	O	G	3
Clarke et al. (2014); Europe	Treatment resistant	61	TAU-CBT	13.33	22.58	43	67	O	G	16
Clarke et al. (2017); Europe	Osteoarthritis	31	Usual Care	31.25	0.00	67	71	O	G	6
Craske et al. (2014); US	SP	87	CBT	20.69	36.36	28	46	O	Ind	12
Davoudi et al. (2017); Asia	Smoking	70	Other active treatment	2.86	5.71	30	0	O	Ind	8
Djordjevic & Frögelí (2012); Europe	Stress	113	TAU	28.99	29.55	25	79	O	G	6
England et al. (2012); US	Anxiety	45	HAB	23.81	20.83	32	80	O	G	6
Finnes et al. (2017); Europe	Sickness Absence	352	WDI	7.32	12.90	46	78	O	Ind	10

Study & Region	Disorder	N	Control group(s)	% dropout		Mean Age	% female	Setting	Format	Tx weeks
				ACT	control group(s)					
Flaxman & Bond (2010); Europe	Distress	107	SIT	13.51	10.81	39	72	O	G	3
Forman et al. (2007); US	Anxiety	101	CT	33.90	42.20	28	80	O	Ind	M = 15.27
Forman et al. (2013); US	Obesity	128	SBT	9.46	20.37	46	100	O	G	40
Gaudio and Herbert (2006); US	Psychosis	40	TAU	5.26	4.76	40	36	Imp	Ind	3
Gaudiano et al. (2015); US	Depression	13	MTAU	16.66	42.86	50	54	O	Ind	16
Ghielen et al. (2017); Europe	Parkinson	46	TAU	13.04	8.70	63	39	O	G	6
Gifford et al. (2004); US	Smoking	76	NRT	36.40	38.10	43	59	O	G & Ind	7
Gifford et al. (2011); US	Smoking	303	BP	33.08	46.82	46	59	O	G & Ind	10
Glassman (2014); US	Anxiety	25	TCBT	0.00	8.33	24	73	O	Ind	1
González-Fernández et al. (2018); Europe	Cancer	66	BA	29.41	22.73	52	92	O	G	12
Gregg, Callaghan, Hayes, & Glenn-Lawson (2007); US	Type 2 diabetes	81	Education	0.00	0.00	51	47	O	G	1
Hancock et al. (2018); Australia	Anxiety	193	CBT	20.59	9.52	11	58	O	G	10
Hayes et al. (2004); US	Polysubstance-Abusing Opiate Addicts	124	MM, ITSF	45.24	24.00	42	51	O	G & Ind	16
Hayes, Boyd, & Sewell (2011); Australia	Depression	38	TAU	13.63	31.25	15	71	O	Ind	NI
Hayes-Skelton, Roemer, & Orsillo (2013); US	Anxiety	81	AR	25.00	21.95	65	33	O	Ind	16
Hernández-López et al. (2009); Europe	Smoking	81	CBT	37.21	23.68	42	64	O	G	7
Hesser et al. (2012); Europe	Tinnitus	99	CBT	2.86	6.25	49	43	S	S	8
Juarascio et al. (2013); US	ED	140	TAU	15.15	8.11	27	100	Imp	G	M = 3.91

Study & Region	Disorder	N	Control group(s)	% dropout		Mean Age	% female	Setting	Format	Tx weeks
				ACT	control group(s)					
Kemani et al. (2016); Europe	Pain	60	AR	0.00	16.66	40	73	O	G	12
Kingston (2008); Europe	Treatment resistant	40	CBT	15.00	40.00	44	60	O	G	16
Kocovski, Fleming, Hawley, Huta, & Antony (2013); US	SAD	137	CBT	30.19	39.62	35	54	O	G	12
Lang et al. (2017); US	Distress	160	PCT	33.75	30.00	34	20	O	Ind	12
Lanza, Garcia, Lamelas, & González-Menéndez (2014); Europe	Substance Use	50	CBT	0.00	0.00	33	100	NI	G	16
Lassen (2010); US	Psychosis	28	TAU	14.29	42.86	42	39	O	G	2
Lillis et al. (2016); US	Weight loss	162	CBT	16.05	13.58	50	85	O	G	52
Luciano et al. (2014); Europe	Fibromyalgia	156	RPT	9.80	11.54	48	96	O	G	NI
Luoma, Kohlenberg, Hayes, & Fletcher (2012); US	Substance Use	133	TAU	10.29	0.00	34	46	Imp	G	1
McCracken et al. (2014); Europe	CP	73	TAU	18.92	2.78	58	68	O	G	5
McMillan et al. (2002); Europe	TBI	145	PE	12.00	19.15	34	22	S	S	4
Moffitt & Mohr (2015); Australia	Physical Activity	76	PWP	0.00	5.40	44	83	S	S	12
Moitra et al. (2017); US	HIV	34	TAU	11.77	5.88	34	21	O	Ind	3
Morton, Snowdon, Gopold, & Guymer (2012); Australia	BPD	41	TAU	23.81	30.00	35	93	O	G	12
Mosher et al. (2018); Europe	Breast Cancer	47	Education	21.74	12.50	56	100	O	I	6
Mo'tamedi, Rezaeiaram, & Tavallaie (2012); Asia	Chronic headache	30	MTAU	26.67	0.00	36	100	O	G	8
Nordin & Rorsman (2012); Europe	Multiple sclerosis	21	RT	9.09	0.00	46	76	O	G	15
Palmeira et al. (2017); Europe	Obesity	73	TAU	8.33	10.81	42	100	O	G	
Parling et al. (2016); Europe	Eating Disorders	43	TAU	25.00	15.80	26	98	O	Ind	19

Study & Region	Disorder	N	Control group(s)	% dropout		Mean Age	% female	Setting	Format	Tx weeks
				ACT	% dropout control group(s)					
Petersen & Zettle (2009); US	Comorbid depression and alcohol use	24	TAU	20.00	7.69	38	50	Inp	Ind	M = 3.2
Scott et al. (2018); Europe	CP	63	SPM	25.81	21.88	46	64	S	Ind	12
Shawyer et al. (2012); Australia	Psychosis	44	Befriending	4.76	9.09	39	44	O	Ind	15
Shawyer et al. (2017); Australia	Psychosis	96	Befriending	6.12	8.51	36	39	O	Ind	8
Shayeghian et al. (2016); Asia	Diabetes	106	Education	5.66	0.00	55	60	O	G	10
Simister et al. (2018); US	Fibromyalgia	67	TAU	9.09	0.00	40	95	S	S	8
Smout et al. (2010); Australia	MUD	104	CBT	56.86	56.60	31	40	O	Ind	12
Steiner et al. (2013); US	Fibromyalgia	28	Education	0.00	0.00	49	100	O	Ind	8
Stotts et al. (2012); US	Methadone Detoxification	56	TAU	40.00	53.85	40	37	O	Ind	24
Thorsell et al. (2011); Europe	CP	90	AR	36.54	18.42	46	64	S	S	7
Trompeter, Bohlmeijer, Veehof, & Schreurs (2015); Europe	CP	238	EW	28.05	36.71	53	76	S	S	12
Twohig et al. (2010); US	OCD	79	PRT	9.80	13.20	37	61	O	Ind	8
Tyrberg, Carlbang, & Lundgren (2017); Europe	Psychosis	21	TAU	4.55	0.00	41	38	I	Ind	1
Vakili et al. (2013); Asia	OCD	27	SSRIs	10.00	27.27	27	44	O	G	NI
Wang et al. (2017); Asia	Procrastination	79	CBT	11.54	7.69	21	47	O	G	8
Weinland et al. (2012); Europe	BS	39	TAU	21.05	10.00	43	90	S	S	6
Westin et al. (2011); Europe	Tinnitus	64	TFT	0.00	10.00	51	47	O	Ind	10
Wetherell et al. (2011a); US	Anxiety	21	CBT	0.00	44.44	71	48	O	Ind	12
Wetherell et al. (2011b); US	CP	114	CBT	10.53	14.03	55	51	O	G	8
White et al. (2011); Europe	Psychosis	27	TAU	0.00	23.08	34	22	O	Ind	10

Study & Region	Disorder	N	Control group(s)	% dropout		Mean Age	% female	Setting	Format	Tx weeks
				ACT	control group(s)					
Wicksell, Melin, Lekander, & Olsson (2009); Europe	LPP	32	MDT	0.00	0.00	15	78	O	Ind	12
Wolitzky-Taylor, Arch, Rosenfield, & Craske (2012); US	Anxiety	121	CBT	36:36	25:76	38	57	O	Ind	12
Zettle (2003); US	Mathematics Anxiety	24	SD	14:29	36:84	31	83	O	Ind	6

Note. NI = not indicated; US = United States; OCD = Obsessive Compulsive Disorder; SP = Social Phobia; MUD = Methamphetamine Use Disorders; SAD = Social Anxiety Disorder; GAD = Generalized Anxiety Disorder; CP = Chronic Pain; LPP = Longstanding pediatric pain; TBI = Traumatic Brain Injury; BS = Bariatric Surgery; ED = Eating disorders; BPD = Borderline Personality Disorder; MS = Minimal Support Group; CBT = Cognitive Behavioral Therapy; CT = Cognitive Therapy; PRT = Progressive Relaxation Training; SD = Systematic Desensitization; SSRIs = Selective Serotonin Reuptake Inhibitors; NCC = Non-standardized Control Condition; RPT = Recommended Pharmacological Treatment; TAU = Treatment as Usual; MM = Methadone maintenance; ITSF = Intensive Twelve Step Facilitation Therapy Plus Methadone Maintenance; PE = Physical Exercise; AR = Applied Relaxation; MDT = Multidisciplinary treatment and amitriptyline; MTAU = medical treatment as usual; EW = Expressive writing; SBT = Standard Behavioral Treatment; SPM = Specialty Medical Management; BP = Bupropion Regimen; NRT = Nicotine Replacement Treatment; ABA = Applied Behavior Analysis; PWP = Pedometer-based walking program; TRT = Timmitus Retraining Therapy; WDI = Workplace Dialogue Intervention; RT = Relaxation Training; BA = Behavioral Activation; SIT = Stress Inoculation Training; HAB = Exposure with Habituation Rationale; PCT = Present-Centered Therapy; tCBT = Traditional Cognitive Behavioral Therapy; O = Outpatient; Inp = Inpatient; S = Self-help; G = Group; Ind = Individual.

Regarding reasons reported for dropout, the majority of studies did not report data about client variables separately for dropout and completers. Of the 65 studies presenting drop-outs in the ACT condition, only 27 studies (41.54%) reported reasons for dropout. Regarding comparisons, all participants completed treatment in 11 studies, whereas for the remaining 65 studies with dropouts, only 30 (45.15%) reported dropout reasons. For ACT, the most frequently reported reasons for dropout were: lost contact ($n = 15$, 55.55%), personal ($n = 12$, 44.44%), transportation difficulties ($n = 10$, 37.04%) and therapy factors ($n = 9$, 33.33%). However, for comparison condition(s) the main reasons for dropout were: lost contact ($n = 19$, 63.33%), therapy factors ($n = 11$, 36.67%) and time demands ($n = 10$, 33.33%). For percentages of clients reporting each of the reasons for the included studies, see Appendix A in [Supplementary Materials](#).

Dropout Rates

Across all studies and comparison conditions, the overall weighted mean dropout rate was 17.95%, 95% CI [15.12, 20.77]. ACT trials reported an average dropout rate of 17.35%, 95% CI [14.33, 20.37] and comparison conditions reported an average dropout rate of 18.62%, 95% CI [15.29, 21.96]. In the CMA, the unconstrained model with the 76 studies of ACT vs. comparison conditions, showed that the heterogeneity detected using the fixed-effects model was very small and non-significant, with $Q(75) = 79.371$, $p = .343$, $I^2 = 5.507\%$. It was thus justifiable to hypothesize that the random errors among the studies were not considerably different and that fixed-effects models could be followed. Despite dropout rates in ACT appearing to be lower than in comparison groups when examining the overall weighted mean dropout rate the difference did not reach statistical significance, as the point estimate of the odds ratio and its confidence intervals included value 1 (i.e., equal odds/risk to dropout) with $OR = 0.931$, 95% CI [0.809, 1.070], $z = -1.011$, $p = .312$; see Appendix B in [Supplementary Materials](#)). The funnel plot for the investigation of publication bias in the meta-analysis (see Appendix B in [Supplementary Materials](#)) indicated no asymmetry, suggesting that there was no statistically significant publication bias, with Egger test $t(74) = 0.591$, 95% CI [-0.617, 0.334], $p = .556$ or the Begg and Mazumdar Kendall's tau, with $\tau = -0.079$, $p = .313$.

Quantitative Synthesis of the Findings of the Reviewed Studies: Meta-Analysis

Participant Moderators

Eight participant variables were first examined as moderators of therapy dropout (see [Table 3](#)).

Table 3
Results From the Subgroup Analysis of Participant, Study and Provider Categorical Moderators on Therapy Dropout

Moderator	N	Mean Dropout Rate		95% CI		Z	p	Q	P
		ACT	Control	ACT	Control				
Client disorder									
Anxiety disorder or social phobia	14	19.41	27.27	13.03, 25.79	21.05, 33.49	-0.663	0.507	7.101	0.526
Depression	2	16.82	19.47	10.57, 23.06	-3.62, 42.56	-0.567	0.571		
Substance abuse or dependence	6	28.73	24.91	11.08, 46.38	4.72, 45.09	0.122	0.903		
Other health related problems	10	12.80	12.90	5.88, 20.01	7.16, 18.64	0.064	0.949		
Chronic Pain	14	18.23	11.93	10.89, 25.66	5.61, 18.24	0.738	0.461		
Chronic health conditions	7	13.86	12.23	6.92, 20.81	6.33, 18.13	0.215	0.829		
Eating pathology/disorder	8	12.59	9.83	6.86, 18.32	4.88, 14.79	0.379	0.705		
Smoking	5	31.10	32.23	16.65, 45.55	16.81, 47.65	-1.265	0.206		
Severe psychopathology	10	10.38	22.37	5.84, 14.92	12.28, 32.47	-2.473	0.013		
Population									
Children and adolescents	3	11.41	13.59	-0.45, 23.26	-4.54, 31.72	0.759	0.448	0.029	0.866
Adults	73	17.59	18.83	14.49, 20.70	15.42, 22.24	-1.149	0.251		
Country									
United States	32	19.75	23.06	15.02, 24.49	17.20, 28.93	-1.538	0.124	1.470	0.689
Australia	8	17.22	21.68	4.82, 29.62	9.60, 33.76	-0.441	0.659		
Europe	29	16.28	14.88	11.70, 20.86	10.90, 18.86	0.493	0.622		
Asia	7	10.96	10.33	3.91, 18.01	2.98, 17.68	0.221	0.825		
Therapist experience level in ACT groups									
Masters/ master level therapists or doctoral students, interns, residents	13	23.26	24.20	14.56, 31.96	15.53, 32.87	0.747	0.455	5.611	0.468
PhD therapists, doctorate	15	15.24	14.25	8.69, 21.80	9.01, 19.50	0.006	0.995		
Mix PhD, students and others	15	16.34	21.90	10.17, 22.52	13.32, 30.48	-2.366	0.018		
Not informed	5	10.90	11.57	3.08, 18.73	0.20, 22.94	-0.738	0.461		
Psychologists mixed levels	19	16.15	18.35	10.34, 21.95	11.43, 25.26	-0.080	0.936		
No therapists (online)	8	19.92	17.43	8.87, 31.16	6.10, 28.75	0.059	0.953		
Non-psychologists	1	21.74	12.50	-	-	0.833	0.405		

Moderator	N	Mean Dropout Rate		95% CI		Z	p	Q	P
		ACT	Control	ACT	Control				
Therapist experience level in comparison groups									
Masters/ master level therapists or doctoral students, interns, residents	10	24.37	23.10	14.65, 34.09	13.38, 32.82	0.765	0.444	5.990	0.541
Mix PhD, students and others	15	14.99	20.58	9.82, 20.15	14.21, 26.95	-1.479	0.139		
Psychiatrists	2	34.74	42.46	31.49, 37.99	33.91, 51.01	-2.087	0.037		
PhD therapists, doctorate	9	17.85	17.84	7.37, 28.34	10.28, 25.41	1.221	0.222		
Non-psychologists (drug staff, alcohol counselor, physician, psycho-pharmacologist)	9	13.49	18.06	8.05, 18.94	7.18, 28.94	-0.122	0.903		
Not informed	12	14.49	9.45	9.37, 19.61	3.05, 15.85	-0.579	0.563		
Psychologists mixed levels	13	15.03	17.29	6.41, 23.66	8.05, 26.52	0.060	0.953		
No therapists (online)	6	21.53	21.57	6.74, 36.33	8.14, 35.00	-0.284	0.777		
Definition of dropout									
failed to complete treatment/ discontinued treatment/leave before the end of tx/refused to return in tx	53	15.35	18.40	11.65, 19.06	14.36, 22.43	-0.234	0.815	0.166	0.999
attended less than or equal to 50-75% of total sessions/weeks	11	22.82	18.68	15.69, 29.94	9.51, 27.86	-1.267	0.205		
attended less than or equal to 76-90% of total sessions	6	24.63	20.47	14.94, 34.31	5.70, 35.23	-0.358	0.720		
failed to attend all sessions	2	20.54	21.45	-5.37, 46.44	4.69, 38.21	-0.131	0.896		
attended less than or equal to 25-40% of total sessions or groups	2	21.60	22.41	8.96, 34.24	-5.62, 50.44	-0.317	0.751		
failed to submit pre and post-treatment data	2	10.96	12.15	1.48, 20.43	5.02, 19.28	-0.279	0.781		
Study type									
Efficacy	42	17.37	20.37	13.06, 21.67	15.71, 25.03	-1.248	0.212	0.366	0.545
Effectiveness	34	17.33	16.46	13.10, 21.56	11.74, 21.18	-0.064	0.949		

Note. Tabled are weighted mean dropout rates of client, design and provider moderators using random-effects analysis. *k* = number of relevant studies included in each analysis; Mean Dropout Rate = the mean percentage of participants terminating prematurely; CI = confidence intervals; Z = two-tailed test indicating which levels of the moderators are significant; Q = test of heterogeneity between levels of each moderator. * *p* < .05. ** *p* < .01. *** *p* < .001.

Regarding categorical moderators, there were no significant differences between subgroups. This was expected as heterogeneity among the studies was very small and the studies were generally favoring ACT groups but this finding did not reach statistical significance. However, separate investigation of the effect sizes in each subgroup of studies showed that a significant finding was noted in the subgroup analysis for the type of disorder under investigation (see Appendix C in [Supplementary Materials](#)); where in studies with a population with a severe psychopathology (i.e., borderline personality disorder, treatment resistant and psychosis) the dropouts were significantly lower in ACT groups compared to comparisons ($OR = 0.473$, $z = -2.473$, $p = .01$). In terms of the six participant continuous moderators, meta-regression analyses based on the odds ratio using a method-of-moments estimation showed that none of them (gender, marriage, ethnicity, employment and mean age) were independent predictors of the effect size.

Treatment Moderators

Eight treatment variables were tested as moderators of dropout rate (see [Table 4](#) for categorical variables). Subgroup analyses of treatment setting showed again non-significant between-group differences for all the variables examined. However, a statistically significant effect was noted in the subgroup analysis using the recruitment setting, as having recruited the population from a public outpatient clinic and/or community advertisements resulted in significantly lower odds of the population to drop out from ACT groups compared to comparison groups, $OR = 0.652$, $z = -2.985$, $p = .003$. No significant differences were found among the rest of the examined treatment moderators and no other significant effect sizes in specific subgroups were noticed.

Provider and Study Moderators

Only a small amount of studies reported therapist gender, age, and ethnicity, deeming it impossible to analyze them as moderators. The experience levels of the therapists in ACT and comparison groups showed non-significant differences. However, in the subgroup analysis of the ACT therapists' experience level a significant effect size was found for the subgroup of therapists from mixed experience levels, including doctoral level, student trainees, and others (e.g., licensed clinicians, psychiatrists, social workers, psychiatric nurses). The odds on dropout from ACT groups were significantly lower than from comparison groups when the ACT therapists consisted of a multi-level and multi-domain team, with $OR = 0.734$, $z = -2.366$, $p = .018$. Also, in the subgroup analysis of the comparison groups' therapists a significant effect favoring ACT groups was found in the subgroup of psychiatrists. When the comparison groups had psychiatrists as the main and only therapists, then participants had significantly higher odds to dropout, compared to ACT groups, with $OR = 0.638$, $z = -2.087$, $p = .037$. Regarding study moderators, subgroup analyses based on region and type of study, or when examining the predictive ability of the year of publication in meta-regression analyses showed no significant results.

Table 4

Results From the Subgroup Analysis of Treatment Categorical Moderators on Therapy Dropout

Moderator	N	Mean Dropout Rate		95% CI		Z	p	Q	P
		ACT	Control	ACT	Control				
Treatment format in ACT groups									
Group	34	15.92	15.26	12.32, 19.52	11.06, 19.47	-0.154	0.878	0.131	0.988
Individual	30	16.37	20.96	11.09, 21.66	15.12, 26.80	-0.518	0.605		
Combined	3	38.24	36.31	31.13, 45.35	23.28, 49.34	-1.112	0.266		
Self-help	9	19.04	17.62	8.97, 29.10	7.62, 27.61	-0.521	0.602		
Description of recruitment setting									
Outpatient clinic affiliated with hospital or med-school	11	16.88	18.72	6.28, 27.48	7.46, 29.98	0.738	0.461	9.254	0.235
Private outpatient clinic/practice	2	12.05	28.03	7.64, 16.45	-1.04, 57.10	-1.351	0.177		
Public outpatient clinic and community advertisements	21	14.44	21.30	9.39, 19.49	14.84, 27.76	-2.985	0.003		
Research or specialty clinic	6	17.49	17.91	6.94, 28.03	11.57, 24.25	0.989	0.323		
University affiliated clinic (psychology training clinic and university counseling center)	10	26.04	24.41	19.01, 33.07	13.98, 34.84	-0.449	0.653		
Inpatient or residential treatment	6	9.21	3.43	3.27, 15.14	0.28, 6.57	0.442	0.659		
At home (self-help and web-based treatments)	11	19.90	17.54	11.66, 28.14	9.36, 25.72	-0.476	0.634		
Not informed	9	18.46	15.66	8.72, 28.21	8.76, 22.56	1.031	0.302		
Treatment setting									
Outpatient	60	17.77	20.24	14.34, 21.20	16.48, 24.00	-1.063	0.288	0.442	0.802
Inpatient	6	9.21	3.43	3.27, 15.14	0.28, 6.57	0.442	0.659		
Self-Help (including web-based)	10	19.71	18.05	10.61, 28.81	9.07, 27.02	-0.405	0.686		
Treatment status									
Providing treatment	59	16.31	19.23	12.92, 31.95	15.50, 22.95	-1.139	0.255	1.273	0.259
Non-providing treatment	17	20.94	16.53	14.50, 27.39	8.93, 24.13	-0.035	0.972		

Moderator	N	Mean Dropout Rate		95% CI		Z	p	Q	P
		ACT	Control	ACT	Control				
Comparison group									
CBT	17	18.73	24.25	11.18, 26.27	16.89, 31.61	-0.188	0.851	2.845	0.724
TAU	17	14.30	13.60	10.57, 18.04	7.42, 19.79	0.413	0.680		
Medication only	9	22.63	23.61	13.08, 32.18	12.30, 34.92	-1.037	0.300		
Other active treatment	12	20.58	21.42	12.07, 29.09	11.93, 30.92	-1.452	0.147		
Component of CBT	12	17.07	19.36	10.03, 24.10	12.83, 25.89	-0.596	0.551		
Education only	9	11.30	7.77	1.78, 20.82	1.77, 13.77	1.233	0.218		

Note. Tabled are weighted mean dropout rates of treatment moderators using random-effects analyses.
 k = number of relevant studies included in each analysis; Mean Dropout Rate = the mean percentage of participants terminating prematurely; CI = confidence intervals; Z = two-tailed test indicating which levels of the moderators are significant; Q = test of heterogeneity between levels of each moderator.
 * $p < .05$. ** $p < .01$. *** $p < .001$.

Sensitivity Analyses

We performed sensitivity analyses based on decisions taken before, or based on the previous findings of the meta-analysis. The exclusion of the three studies that consisted of dissertations, showed that the main effect did not change significantly, with $OR = 0.951$, 95% CI [0.826, 1.094], $z = -0.705$, $p = .481$, even though heterogeneity was slightly reduced, with $Q(72) = 73.808$, $p = .419$, $I^2 = 2.450$. The next sensitivity analysis concerned the exclusion of studies with very wide confidence intervals of the odds ratio and showed again no change of the main effect. Later on, we investigated the main effect when excluding recent papers (2016-2018), as the meta-regression analysis for the predictive ability of the year of publication showed a trend to significance. This sensitivity analysis (see Appendix D in [Supplementary Materials](#)) showed that the main effect became marginally significant, with $OR = 0.852$, 95% CI [0.727, 0.998], $z = -1.984$, $p = .047$, even though heterogeneity was slightly increased but remained at small levels, with $Q(54) = 60.961$, $p = .240$, $I^2 = 11.418$. The finding of the sensitivity analysis concerning the year of publication suggested that when considering research done before 2016, the dropouts from ACT groups were significantly lower than from active comparison groups.

Discussion

Treatment dropout is an important parameter impacting treatment outcomes ([Barrett et al., 2008](#); [Wierzbicki & Pekarik, 1993](#)). Despite the acknowledgement of the importance of considering dropout rates and how these influence treatment effectiveness conclusions, this phenomenon has not been extensively examined. This paper aimed to investigate the phenomenon of dropout in a relatively newly developed therapeutic approach, Acceptance and Commitment Therapy. Compared to other cognitive behavioral approaches, ACT presents with advances in improving client engagement to treatment, emphasizes the therapeutic relationship, and provides meaning for any changes to be made during treatment, postulated to be associated with more participant engagement. Indeed, change in values has been found to precede changes in suffering ([Gloster et al., 2017](#)). As such, we aimed to examine if those advances presented in ACT could overcome some of the treatment acceptability criticisms presented with older generations of interventions, which may have contributed to increased dropout rates from psychological treatments. However, the overall dropout rate was not significantly different between ACT and comparison groups in the present meta-analysis.

As noted by others, we found that there is no consensus regarding the definition employed by investigators. We adopted a broad definition of treatment dropout, utilizing what was reported by each study author and particularly considering dropouts to be the percentage of cases of individuals who began treatment but did not complete it as intended by its developer. Based on this definition, the yielded overall dropout rate across all

studies included in this meta-analysis was 17.95%, which is comparable to recent previously meta-analytically reported rates (i.e., 19.70%; [Swift & Greenberg, 2012](#)). For ACT, the calculated mean dropout rate was 17.35%. This is similar again to the rates reported by [Galloway-Williams, Martin, Clum, and Cooper \(2013\)](#) and [Ong et al. \(2018\)](#) for ACT. When including all possible reasons and comparing across all comparison conditions, the dropout rate was not significantly different (18.62%) from ACT groups. However, the reason why individuals terminate their treatment prematurely needs to be considered in relation to dropout rates.

Unfortunately, the majority of examined studies did not include dropout reasons, limiting our ability to draw conclusions regarding the reasons for dropout. Despite the limited number of studies presenting reasons for dropouts, some important differences between ACT and other groups were identified. For example, most individuals who dropped out from ACT groups did so because of lost contact and for (unrelated to therapy) personal reasons. Dropout reasons in comparison conditions however, included additionally therapy-related reasons (e.g., not satisfied with the treatment or feeling that the therapy was too time consuming). In particular, when ACT was compared to CBT, the most frequent reason for dropping out of CBT was therapy factors (i.e., of the 5 studies who reported reasons for dropout from CBT, all of them mentioned therapy factors). In contrast, in ACT, the reasons of time demands, transportation, personal and therapy were equally reported. This is in line with findings reported by [Karekla \(2004\)](#) who found differences in the timing of dropout in relation to the treatment components between tCBT and ACT participants. The pattern of dropout in tCBT was linked to the initiation of exposure whereas the same pattern was not found for those in the ACT condition (where individuals who dropped out did so for unrelated reasons to treatment and discontinued at different time points and not before exposure was introduced). These findings lend support to the idea that ACT may be a more acceptable treatment choice over previous waves of tCBT, and may better prepare (e.g., via use of values) individuals to engage and ultimately benefit from even the most difficult of treatment content (e.g., exposure to feared stimuli; see also [Gloster et al., 2014, 2015](#)). In the future, researchers are advised to examine and report upon the timing and reasons for dropout.

In this review, we found that ACTs' premature termination rates were lower for dealing with certain types of psychopathology (severe psychopathology). This finding may highlight the important addition of ACT skills for severe psychopathologic conditions; however this needs to be further explored. Interestingly, participants' age did not moderate dropout rates, suggesting that all age groups result in similar dropout rates. This is a divergence from the [Swift and Greenberg \(2012\)](#) meta-analysis, where younger individuals had higher dropout rates ([Barrett et al., 2008](#)).

The subgroup analyses based on the description of the treatment setting showed that dropout rates from ACT groups were lower for studies in which the treatment was delivered in a public outpatient clinic and population was recruited by community advertise-

ments. However, one should note that these studies were highly heterogeneous, including participants with anxiety disorders, eating disorders, substance abuse, other health problems, chronic pain, health conditions/chronic illnesses, smoking, severe psychopathology (i.e., BPD, psychosis, treatment resistant), and depression. Additionally, in most of these studies the comparison condition was not another psychologically active intervention (i.e., in 57% of them the comparison group was treatment as usual, medication only and education). Due to the high heterogeneity of these studies, this finding should be interpreted with caution and further examined in the future.

In terms of provider moderators, experience level of providers in ACT and comparison groups were significantly related to dropout rates. Specifically, when treatment was delivered by a multi-level and multi-domain team, ACT had lower dropout rates than comparison conditions. This is a divergence from the studies of [Ong et al. \(2018\)](#) and [Swift and Greenberg \(2012\)](#), who reported no significant results when treatment was delivered by multidisciplinary teams. In particular, in the study of [Ong et al. \(2018\)](#), ACT had higher dropout rates than comparison groups when treatment was administered by master's-level clinicians/therapists whereas in the study of [Swift and Greenberg \(2012\)](#) dropout rates were higher when the treatment was provided by trainees. Differences between these studies may be a result of the definition used for therapist experience level, therefore more research is needed in this domain to be able to conclusively make recommendations as to the level of experience or the consistency of the therapeutic team that leads to higher effect sizes. For the guidance of future researchers examining dropouts in treatments, a checklist of definitions and variables to be collected which can be utilized before, during and while reporting their findings, to ensure that adequate information regarding dropouts is available, is presented in Appendix E (see [Supplementary Materials](#)).

Limitations

This study has several limitations that need to be considered in the interpretation of findings. First, the inclusion criteria were made broad enough in order to include a large number of studies. All age groups were included; as well as various psychopathological and non-psychopathological problems, and studies combining ACT with other interventions or medication. Though we attempted to deal with this heterogeneity in the disorders, interventions, populations and age conditions by examining moderators of interest, this heterogeneity may have still affected the clarity of any differences between ACT and comparison groups on dropout rates.

A second limitation may be related to the coding procedure. Specifically, for the variable of comparison condition, when a study had two comparison conditions we selected to compare only the active treatment (e.g., CBT) and excluded the inactive comparison condition (e.g., wait-list). A third limitation has to do with reasons reported for dropouts. Specifically, the majority of studies did not report dropout reasons, making conclusions about true reasons for dropout impossible or biased for the studies that reported these

reasons. In order to further elucidate the phenomenon of treatment dropout, future studies should examine and report reasons why participants drop out as well as the timing when this occurs. Finally, in our meta-analysis it was not possible to carry out a comparison between the demographic characteristics of dropouts and completers due to insufficient data provided by studies. We would like to encourage researchers to ensure that they report information separately for completers and dropouts so as to facilitate further understanding into the phenomenon of dropout.

Clinical Implications

This review examined dropout rates of a third wave CBT intervention in a range of disorders, populations, ages and comparison conditions. Our findings show that overall dropout rates between ACT and comparison conditions were not found to differ significantly. Additionally, moderation analyses suggest that experience level of therapists in ACT and comparison conditions, description of treatment setting, and client diagnosis are associated with an increased likelihood of dropout. Therefore, interventions aiming to lower attrition should plan a-priori how to better engage users belonging to these groups.

Our findings suggest that ACT may present some potential advances for improving client engagement and retention, such as emphasizing that any behavior change needs to be linked with the persons' values, or it may include more interesting treatment content through the use of metaphors and experiential exercises. However, more research is still needed prior to being able to assertively make these conclusions.

Future Research

The findings of the present study offer possible hypotheses about which therapeutic processes are associated with client retention. However, more studies are needed that will examine particular reasons for premature treatment termination, timing when this phenomenon occurs and how it may be linked to specific treatment components, and associated variables in third wave treatments.

Moderators of the dropout effect for different therapeutic approaches are critical in that they illuminate areas that may still have potential for improvement in the context of an otherwise effective intervention. This needs to be further examined. For example, even if ACT has lower dropout rates than some comparison conditions overall, but females drop out more from ACT than comparison conditions, then ACT may need to consider how females are being engaged in the intervention and attempt to find ways to improve engagement (e.g., maybe more gender sensitive metaphors). Additionally, common vs. specific factors in the psychotherapies being examined and in relation to how these may affect dropout also need to be examined. Researchers are encouraged to examine and report the reasons for dropout when a person discontinues the treatment prematurely. Further understanding of these reasons should allow us to examine whether it is dis-

satisfaction with the common factors (e.g., therapeutic alliance, expectations, cultural adaptations, empathy) that contribute to premature discontinuation or whether dropout is related to specific factors (e.g., specific ingredients of the intervention provided). It is essential that participant engagement and premature termination continue to serve as topics of exploration in the clinical psychology arena, so as to improve the effectiveness of interventions, decrease treatment dropout rates, and enhance the possible treatment effects for participants.

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Data Availability: Datasets for the studies are freely available (see the [Supplementary Materials](#) section).

Supplementary Materials

The following data and materials are available for this study (for access see Index of [Supplementary Materials](#) below):

Via the PsychArchives repository:

- Appendix A: Percentages of clients reporting each of the reasons for the included studies
- Appendix B: Forest and funnel plots of included studies
- Appendix C: Forest plot of subgroup analyses based on the type of disorder under investigation
- Appendix D: Sensitivity analysis for the year of publication
- Appendix E: Checklist of definitions and variables to be collected in order to properly document dropouts

Via the International Prospective Register of Systematic Reviews (PROSPERO):

- Preregistered protocol (CRD42017068456) of the current study

Index of Supplementary Materials

Karekla, M., Konstantinou, P., Ioannou, M., Kareklas, I., & Gloster, A. T. (2019). *Supplementary materials to "The phenomenon of treatment dropout, reasons and moderators in Acceptance and Commitment Therapy and other active treatments: A meta-analytic review"*. PsychOpen.

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review and meta-analysis. (PROSPERO 2017 CRD42017068456). PROSPERO.

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Note. Asterisk (*) marks references of studies included in the meta-analysis.

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