

**UNIVERSIDADE DE BRASÍLIA**  
**INSTITUTO DE PSICOLOGIA**  
**PROGRAMA DE PÓS-GRADUAÇÃO EM PSICOLOGIA CLÍNICA E CULTURA**

**ACCEPTANCE AND COMMITMENT THERAPY (ACT) IN HOSPITALS  
AND PRIMARY CARE: A SYSTEMATIC REVIEW OF CLINICAL  
TRIALS**

**TERAPIA DE ACEITAÇÃO E COMPROMISSO (ACT) EM HOSPITAIS E  
ATENÇÃO PRIMÁRIA: UMA REVISÃO SISTEMÁTICA DE ENSAIOS  
CLÍNICOS**

**Michelli Carrijo Cameoka**

Brasília, DF

Dezembro, 2023

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**Michelli Carrijo Cameoka**

Dissertação apresentada ao Instituto de Psicologia da Universidade de Brasília como requisito parcial à obtenção do título de Mestre em Psicologia Clínica e Cultura, linha de pesquisa Psicologia da Saúde e Contextos Clínicos.

Orientadora: Prof<sup>a</sup> Dr<sup>a</sup> Eliane Maria Fleury Seidl

Brasília, DF

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**UNIVERSIDADE DE BRASÍLIA**  
**INSTITUTO DE PSICOLOGIA**

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## Resumo

Esta revisão sistemática da literatura teve como objetivo investigar as evidências empíricas sobre o uso da terapia de aceitação e compromisso (ACT) em contextos hospitalares não psiquiátricos e de Atenção Primária à Saúde (APS). Os objetivos específicos foram identificar o contexto da pesquisa; populações atendidas; delineamentos de pesquisa e grupos controle; características das intervenções; variáveis dependentes e instrumentos de medição; e resultados alcançados. O método seguiu as diretrizes PRISMA e o estudo foi registrado junto ao sistema PROSPERO. Foram buscados artigos publicados entre 1º de janeiro de 2000 e 1º de maio de 2022, nas bases ProQuest, PubMed, Biblioteca Virtual em Saúde (BVS), *Academic Search Premier* e PsycNET. Os critérios de inclusão foram: ensaios clínicos, publicados em português, inglês ou espanhol, nos quais pacientes adultos hospitalizados (ambiente não psiquiátrico) ou atendidos em APS, receberam intervenções da ACT, com diversas variáveis dependentes. Os termos de busca em inglês foram (“acceptance and commitment therapy”) AND (“hospital\*” OR “primary care”) e suas versões em português e espanhol, com variações de sintaxe conforme a base. Resultaram 357 artigos da busca inicial. A autora e duas outras revisoras psicólogas trabalharam de forma independente na seleção dos estudos identificados nas bases de dados por título e resumo. Vinte e nove estudos foram selecionados, sendo 11 (37,9%) do Irã, três do Reino Unido, dois dos EUA e dois da Dinamarca. Os 11 restantes foram de Canadá, Suécia, Itália, Espanha, Japão, Indonésia, Portugal, Países Baixos, China, Nova Zelândia e Noruega. O número total de participantes foi 2.772, de 13 a 343 por estudo, de ambos os sexos e diversas condições de saúde. Aqueles submetidos à ACT foram 1.374, variando de 6 a 150 por estudo. Houve seis estudos na atenção primária e 23 em hospitais. A ACT foi usada em combinação com outras intervenções em 14 estudos. Foram empregadas 111 variáveis dependentes, 81 instrumentos de medida padronizados, 14 medidas fisiológicas, prontuários médicos e questionários não padronizados. Quanto ao delineamento, foram 14 ensaios quase experimentais, dez dos quais com grupos de controle, e 15 ensaios clínicos randomizados. Em cinco estudos a ACT foi comparada diretamente com outros tratamentos ativos. Os resultados reportados foram mistos: alguns positivos e outros neutros, mas não foram identificados resultados negativos. A qualidade metodológica dos artigos foi heterogênea e foram observadas várias limitações que prejudicaram a validade interna e a possibilidade de generalização: poucos estudos, amostras pequenas, não contabilização de desistências, *follow-up* breve ou inexistente, amostragem não aleatória, falta de controle da integridade das intervenções, alta dependência de autorrelatos, poucos detalhes sobre os procedimentos terapêuticos. Conclui-se que a ACT tem sido utilizada como intervenção em contextos hospitalar e de atenção primária, mas a grande variabilidade em termos do país, das variáveis e instrumentos utilizados, das condições de saúde visadas, da forma de aplicação e dos procedimentos metodológicos sugere que essa utilização ainda está em uma fase exploratória. É desejável que haja novos estudos sobre o tema e com maior qualidade metodológica.

*Palavras-chave:* terapia de aceitação e compromisso; hospital; atenção primária; eficácia; revisão sistemática.

## Abstract

This systematic literature review aimed to investigate empirical evidence on the use of acceptance and commitment therapy (ACT) in non-psychiatric hospital and Primary Health Care (PHC) contexts. The specific objectives were to identify the research context; populations served; research designs and control groups; characteristics of the interventions; dependent variables and measurement instruments; and results achieved. The method followed the PRISMA guidelines, and the study was registered with the PROSPERO system. Articles published between January 1, 2000 and May 1, 2022 were searched in the ProQuest, PubMed, Virtual Health Library (VHL), Academic Search Premier and PsycNET databases. The inclusion criteria were: clinical trials, published in Portuguese, English or Spanish, in which adult patients hospitalized (non-psychiatric environment) or treated in PHC, received ACT interventions, with several dependent variables. The search terms in English were (“acceptance and commitment therapy”) AND (“hospital\*” OR “primary care”) and their versions in Portuguese and Spanish, with syntax variations depending on the base. 357 articles resulted from the initial search. The author and two other psychologist reviewers worked independently to select the studies identified in the databases by title and abstract. Twenty-nine studies were selected, 11 (37.9%) from Iran, three from the United Kingdom, two from the USA and two from Denmark. The remaining 11 were from Canada, Sweden, Italy, Spain, Japan, Indonesia, Portugal, the Netherlands, China, New Zealand and Norway. The total number of participants was 2,772, from 13 to 343 per study, of both sexes and various health conditions. Those undergoing ACT were 1,374, ranging from 6 to 150 per study. There were six studies in primary care and 23 in hospitals. ACT was used in combination with other interventions in 14 studies. 111 dependent variables, 81 standardized measurement instruments, 14 physiological measurements, medical records and non-standardized questionnaires were used. Regarding the design, there were 14 quasi-experimental trials, ten of which with control groups, and 15 randomized clinical trials. In five studies, ACT was directly compared with other active treatments. The reported results were mixed: some positive and some neutral, but no negative results were identified. The methodological quality of the articles was heterogeneous, and several limitations were observed that hindered internal validity and the possibility of generalization: few studies, small samples, non-accounting for dropouts, brief or non-existent follow-up, non-random sampling, lack of integrity control of interventions, high dependence on self-reports, few details about therapeutic procedures. It is concluded that ACT has been used as an intervention in hospital and primary care contexts, but the great variability in terms of country, variables and instruments used, health conditions targeted, form of application and methodological procedures suggests that This use is still in an exploratory phase. It is desirable that there be new studies on the topic and with higher methodological quality.

*Key words:* acceptance and commitment therapy; hospital; primary care; efficacy; systematic review.

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### Lista de siglas

<b>AAQ-II</b>	Acceptance and Action Questionnaire II
<b>ACT</b>	Acceptance and commitment therapy
<b>ACT-FM</b>	ACT Fidelity Measure
<b>ACTMuS</b>	Acceptance and commitment therapy for muscle disease
<b>AIS</b>	Avoidance and Inflexibility Scale
<b>BDD-YBOCS</b>	Yale-Brown Obsessive-Compulsive Scale - Body Dysmorphic Disorder
<b>BDI</b>	Beck Depression Inventory
<b>BDI-II</b>	Beck Depression Inventory II
<b>BHS</b>	Beck Hopelessness Scale
<b>BPI</b>	Brief Pain Inventory
<b>BPI-SF</b>	Brief Pain Inventory–Short Form
<b>BSCS</b>	Brief Self-Control Scale
<b>BSI-18</b>	Brief Symptom Inventory 18
<b>CAQ-8</b>	Committed Action Questionnaire-8
<b>CBT</b>	Cognitive behavioral therapy
<b>CD-RISC</b>	Conner and Davidson Resilience Scale
<b>CERQ</b>	Cognitive Emotion Regulation Questionnaire
<b>CGI</b>	Clinical Global Improvement
<b>CORE-OM</b>	Clinical Outcome in Routine Evaluation-Outcome Measure
<b>CPAQ</b>	Chronic Pain Acceptance Questionnaire
<b>CPAQ-8</b>	Chronic Pain Acceptance Questionnaire-8
<b>CPAQ-R</b>	Chronic Pain Acceptance Questionnaire-Revised
<b>CPCI</b>	Chronic Pain Coping Inventory - Short Form
<b>CSQ</b>	Coping strategies Questionnaire - Catastrophizing Scale
<b>CSQ-8</b>	Client Satisfaction Questionnaire
<b>DAP-R</b>	Death Attitude Profile-Revised
<b>DASS-21</b>	Depression Anxiety Stress Scale-21
<b>DHI</b>	Dizziness Handicap Inventory
<b>Emoqol-100</b>	single question on the emotional quality of life
<b>EQ-5D-5L</b>	EuroQol standardized measure of health-related quality of life

<b>FFMQ</b>	Five Facet Mindfulness Questionnaire
<b>FSS</b>	Fatigue Severity Scale
<b>FTND</b>	Fagerstrom Test for Nicotine Dependence
<b>FU</b>	follow-up
<b>GAD-7</b>	Generalized Anxiety Disorder-7
<b>GHQ-12</b>	General Health Questionnaire-12
<b>HADS</b>	Hospital Anxiety and Depression Scale
<b>HAQ-DI</b>	Stanford Health Assessment Questionnaire Disability Index
<b>HARS</b>	Hamilton Anxiety Rating Scale
<b>iACT</b>	Internet-delivered acceptance and commitment therapy
<b>IBM-FRS</b>	Inclusion Body Myositis Functional Rating Scale
<b>INQoL</b>	Individualised Neuromuscular Quality of Life Questionnaire
<b>K-10</b>	Kessler Psychological Distress Scale
<b>MAAS</b>	Mindfulness Attention Awareness Scale
<b>MED</b>	morphine equivalent dose
<b>MHC-SF</b>	Mental Health Continuum-Short Form
<b>MIDAS</b>	Migraine Disability Assessment Scale
<b>MINI-Plus:</b>	Mini-International Neuropsychiatric Interview-Plus
<b>MLHFQ</b>	Minnesota Living with Heart Failure Questionnaire
<b>MPI</b>	Multidimensional Pain Inventory
<b>MPQ</b>	McGill Pain Questionnaire
<b>MPQ-SF</b>	McGill Pain Questionnaire - Short Form
<b>NEQ</b>	Negative Effects Questionnaire
<b>ODI</b>	Oswestry Disability Index
<b>PASS</b>	Pain Anxiety Symptoms Scale-Short Form
<b>PCS</b>	Pain Catastrophizing Scale
<b>PEG</b>	The Pain, Enjoyment of Life and General Activity Scale
<b>PEPPI</b>	Perceived Efficacy in Patient-Physician Interactions
<b>PGIC</b>	Patient Global Impression of Change
<b>PHC</b>	primary health care
<b>PHQ</b>	Patient Health Questionnaire

<b>PIPS</b>	Psychological Inflexibility in Pain Scale
<b>PRAQ</b>	Pregnancy-Related Anxiety Questionnaire
<b>PSEQ</b>	Pain Self-Efficacy Questionnaire
<b>PSFS</b>	Patient-Specific Functional Scale
<b>PSQI</b>	Pittsburgh sleep quality index
<b>PSS</b>	Perceived Stress Scale
<b>RMDQ</b>	Roland Morris Disability Questionnaire
<b>SCL-92</b>	Symptom Checklist-92
<b>SDS</b>	Sheehan Disability Scale
<b>SF-12</b>	MOS Short Form 12v2
<b>SF-36</b>	Rand Short Form Health Survey-36
<b>SHAI</b>	Health Anxiety Inventory Short-form
<b>SIP</b>	Sickness Impact Profile
<b>SOPA</b>	Survey of Pain Attitudes
<b>SPTS-12</b>	Sensitivity to Pain Traumatization Scale-12
<b>SQRP</b>	Swedish Quality Registry for Pain Rehabilitation
<b>STAI-T</b>	State-Trait Anxiety Inventory-Trait
<b>SUS</b>	Sistema Único de Saúde
<b>VAS</b>	Visual Analog Scale
<b>VSS</b>	Vertigo Symptom Scale - short form
<b>WHO-5</b>	World Health Organization Well-being Index
<b>WHODAS</b>	World Health Organization Disability Assessment Schedule
<b>WHOQOL</b>	World Health Organization Quality of Life Questionnaire
<b>WHOQOL-Bref</b>	Abbreviated World Health Organization Quality of Life Questionnaire
<b>WI-7=</b>	Whiteley-7 Index of health anxiety
<b>WPAI:GH</b>	Work Productivity and Activity Impairment General Health V.2.1
<b>WSAS</b>	Work and Social Adjustment Scale

## **Apresentação**

Minha jornada na psicologia começou quando eu mesma fui fazer terapia, lá em 2014. Depois de um tempo dedicado a viver com meus filhos as primeiras aventuras deles nesta vida, outras coisas haviam se transformado sobre como eu me via e para onde queria caminhar profissionalmente. Minha querida terapeuta e hoje amiga Denise Lettieri me ajudou a dar passos importantes. Com seu jeito acolhedor e a competência para me ensinar novos olhares, também abriu meu coração e minha curiosidade para a análise do comportamento.

Em 2015 ingressei na graduação e logo cresceu em mim uma identificação com a análise do comportamento. Quando conheci a ACT, foi quase uma revelação. Ou, talvez, uma boia salva-vidas, em meio ao mar de teorias e abordagens que não me tocavam, querendo me submergir em dúvidas. Gostei demais do jeito humano e empático como a ACT conecta as pessoas. Ao mesmo tempo, pela lente dos princípios da análise do comportamento, a psicologia ganhou uma nova nitidez.

Durante esses anos iniciais, minha prioridade foi conhecer um pouco de várias possibilidades de intervenção prática. Além da faculdade, logo passei a frequentar cursos e seminários. Antes de me formar, tive meus primeiros contatos com DBT, Ativação Comportamental, Terapia Integrativa de Casais, Mindfulness, Terapia Focada na Compaixão. O campo das terapias baseadas na ciência comportamental contextual e na filosofia do contextualismo funcional se abria para mim. Antes de graduar, meu “batismo” foi uma formação intensa na Filadélfia com alguns dos criadores da ACT: Steven Hayes, Robyn Walser e Kelly Wilson. Foi um divisor de águas.

Em 2021, um novo marco. Fui fazer o estágio da graduação no Hospital Regional da Asa Norte (HRAN) durante a pandemia de covid-19. Vivenciar de perto aquelas dores, aqueles medos, as lutas, as emoções das gentes no turbilhão da doença foi muito forte e inspirador. Acendeu em mim a vontade de juntar ACT e a atenção em saúde de forma mais ampla. Nessa

época eu já havia começado a atuar na clínica, mas a psicologia da saúde havia entrado no meu radar.

Por isso mesmo, foi natural escolher esse tema para fazer minha monografia de graduação e aprofundá-lo no mestrado, unindo a ACT com a atuação das psicólogas em hospitais e outros ambientes do sistema de saúde. Foi também pensando nisso que apareceu a oportunidade e resolvi fazer um curso muito especial em 2022, um *Summer Camp*, com Kirk Strosahl, Patricia Robinson e Thomas Gustavsson: ACT focada, ou fACT. É um modelo de intervenção brevíssimo desenvolvido para aplicação em contextos como a atenção primária, quando o tempo de interação é curtíssimo.

Dessa forma cheguei aqui e agora. Esta dissertação une minha bagagem com oportunidades de crescimento acadêmico que só a universidade proporciona. A opção pela língua inglesa foi um desafio a mim mesma e uma maneira de, talvez, facilitar a difusão do trabalho. A escrita foi pensada para que o texto já fosse feito com um formato de artigo científico.

## **Acceptance and Commitment Therapy (ACT) in Hospitals and Primary Care: A Systematic Review of Clinical Trials**

Broadly, health psychology can be defined as the use of psychological principles and research to improve health and prevent as well as treat diseases, considering health to be an all-encompassing state of physical, mental, and social well-being. Among its goals are the evaluation and improvement of health policy, and the delivery of health care to all people, considering the interplay of biological, sociocultural, and psychological variables. Among many possibilities, health psychologists may engage in activities such as research and clinical intervention, in settings like hospitals, clinics, and universities. In this sense, the work of psychologists within health systems at large can be framed as subfields within the larger field of health psychology (Straub, 2019).

This general characterization essentially coheres with other widely accepted definitions, such as that of the American Psychological Association (APA), which has since 1979 had its Division 38 devoted to what it refers to as clinical health psychology (Belar et al., 2013). The delimitation of the field owes much to the original and still influential definition forwarded by Matarazzo (1980):

Health psychology is the aggregate of the specific educational, scientific, and professional contributions of the discipline of psychology to the promotion and maintenance of health, the prevention and treatment of illness, and the identification of etiologic and diagnostic correlates of health, illness, and related dysfunction. (p. 815)

Numerous factors have played a role in the establishment of health psychology, including perceived limitations of the biomedical model in understanding and explaining the health-disease process. Furthermore, epidemiological shifts and alterations in morbidity and mortality patterns, marked by a surge in chronic-degenerative diseases, many of which



are linked to behavioral and lifestyle factors, have significantly contributed to this consolidation. Additionally, there has been an increasing emphasis on health promotion and disease prevention in the healthcare policies of various nations (Straub, 2019).

### **Health Psychology and Hospital Psychology**

It is worth noting that in Brazil hospital psychology is often defined as field apart from health psychology (Castro & Bornholdt, 2004). The Federal Psychology Council, which is the country's nationwide formal professional body, recognizes both as specialized fields within the profession. Hospital psychology is recognized as such since 2000, that is, 16 years before health psychology was (Conselho Federal de Psicologia [CFP], 2000, 2022). Some Brazilian psychologists that work in hospitals assert that the term hospital psychology doesn't refer to a specific location of practice but rather to a very specialized set of activities and a field of knowledge (Azevêdo & Crepaldi, 2016; Bruscato et al., 2004).

Other professionals hold a different and arguably more comprehensive view on this matter, asserting that hospital psychology should be considered a subfield of health psychology, following the way it is conceptualized in other countries. From this perspective, it is argued that the term hospital psychology is inappropriate because it is referring to a field of practice rather than to the activities of psychology, fragmenting and hindering the consolidation of health psychology itself as a comprehensive field (Yamamoto et al., 2002). Thus, hospital psychology would be better dealt with as an approach and a strategy within health psychology, being more aptly termed "psychology in the hospital context" (Castro and Bornholdt, 2004; Gorayeb & Possani, 2015).

### **Interventions in Health Contexts**

Psychological interventions in the hospital context are varied and can be aimed at patients themselves, their families or the professionals who provide health services. In

general, this work takes place within multidisciplinary teams and often at the request of another specialist, mainly from the medical field, in the form of assistance aimed at resolving specific problems, such as bouts of depression or difficulty in adhering to a treatment (Tonetto & Gomes, 2007). More generally, individual care and guidance for family members and caregivers are frequent practices in the daily lives of these professionals. Psychological interventions in non-psychiatric health contexts gain even more relevance based on the recognition that psychological well-being is closely related to both health promotion and maintenance, along with disease prevention (Durgante & Dell'Aglio, 2018). This includes psychological assessments and diagnoses, as well as preventive approaches, brief interventions, and psychotherapy itself, whether for the person directly assisted in the health units or for other participants in this relationship, such as caregivers, and eventually doctors and nurses (Baker & McFall, 2014; Robinson & Reiter, 2016).

Historically, surveys conducted in different Brazilian regions have unearthed some characteristics of health psychologists' work in this field. For instance, studies in the Federal District (Seidl & Costa, 1999), Florianópolis (Marcon et al., 2004), and Natal (Yamamoto et al.; 2002), detected a predominance of work in hospital settings. More recently, a survey of 96 health psychologists in the Federal District identified that most respondents (66.7%) worked in hospitals (Seidl et al., 2019).

According to this study, a smaller proportion, 7.3%, labored in Basic Health Units (Unidades Básicas de Saúde – UBS), while 9.6% were employed in Psychosocial Care Centers (Centros de Atenção Psicossocial – CAPS): The UBS are typical primary care facilities that develop health actions at the individual and collective level covering health promotion and prevention, diagnosis, treatment and rehabilitation, with the aim of developing comprehensive care, being the main gateway to the health system, on the other

hand, the CAPS, which attend to serious psychiatric patients, in the logic of open community-based services, are properly situated in the secondary care tier of the health system but often function as a first-contact point as well. Furthermore, the majority (88.4%) also indicated being employed in a public service of the Brazilian Unified Health System (Sistema Único de Saúde – SUS), with 84.4% securing their positions through a public job selection process (Seidl et al., 2019).

A recent secondary data analysis was based on primary data from the National Registry of Health Establishments (Cadastro Nacional de Estabelecimentos de Saúde – CNES), the official information system for registering data from all health establishments and healthcare workforce in Brazil's public or private health establishments. In accordance with a stratified analysis in this study, 39,555 psychologists and psychoanalysts were working in the public health system in January 2021 (República em Dados, 2023).

Drawing from data of the most recent and comprehensive national census of psychologists to date, Bastos et al. (2022) reported that 85% of a sample of 20,207 professionals from all regions of the country were effectively working in any field of the profession. Among those, 19% declared to work in the field of health psychology. Interestingly, only 2% worked exclusively in this field. By comparison, clinical psychology was the most cited field, with 73.1% of answers.

The main activities performed by psychologists in the field of health were psychotherapy (49% of replies), individual psychotherapy (19.9%), psychological support (12.9%), psychological assessment (9.9%), teaching (8.8%), listening (8.3%), research (7.8%), supervision (6.9%), and lectures/conferences/workshops/seminars (6%). On the other hand, activities deemed characteristic of the health sector are observed in markedly low citation percentages, such as matrix support activities (3.9%), brief psychotherapy (3.1%) psychoeducation (3%), therapeutic workshops (3%), family support (2.7%),

psychosocial assessment and intervention (2.6%), and group psychotherapy (2.5%).

Numbers add more than 100% because multiple choice was allowed (Bastos et al., 2022).

A further 6.2% of participants reported being active in the field of hospital psychology (1% with exclusive dedication). They declared that their prime activities were psychological welcoming and support (15%), infirmary and ICU assistance (12.2%), psychological assessment (12.2%), listening (8.7%), supervision (7.9%), and teaching (7.3%). Interestingly, some other activities also important in hospital psychology were seldom performed. For example, psychological support (4.1%), psychological orientation (3.8%), psychoeducation (2.9%), maternal and child assistance (2.6%), elderly care (2.1%), family support (2.1%), and assessment and preparation for surgery or post-surgical follow-up (1.3%) (Bastos et al., 2022)

Regarding the Bastos et al. (2022) study, a couple of methodological caveats merit mentioning: (a) the professionals fields surveyed were the ones ranked in the Resolution CFP no. 23, from October 13, 2022 (CFP, 2022), the updated norm by which the Federal Psychology Council officially recognizes the specialties of psychology, with the possibility of multiple choice, which the authors recognize was a suboptimal solution to delimit work or even scientific areas; and (b) the categories of activities performed were presented as is, without a definition, leaving room for subjective interpretation and, besides, there is a clear overlap between some of them. This research outline may have been a source of accounting distortion since it seems likely that different fields and activities could be chosen by a significant number of individual respondents due to overlapping duties and work environment (Bastos et al., 2022).

### **Interventions Within the Health System**

The inception of the Brazilian Unified Health System (Sistema Único de Saúde – SUS), through the 1988 Constitution, has favored the incorporation of psychology in the

healthcare domain. The SUS promotes the formation of multidisciplinary teams rooted in a comprehensive conceptualization of health, given its foundational principles of universality, broadness of care, equity, and interdisciplinarity (Buss & Pelegrini, 2007).

Since the SUS was put in place, there has been a notable expansion of psychology's role in primary care, particularly within the so-called Family Health Strategy (Estratégia de Saúde da Família – ESF) and, since May 2023, through multiprofessional teams (eMulti). The ESF concentrates on health promotion, community-based care, and the safeguarding of human rights. On the other hand, eMulti refers to teams of health professionals working collaboratively in primary health care (PHC), providing integrated and complementary services to benefit the population and territory, as a support framework for ESF teams, with the goal of enhancing the quality and comprehensiveness of primary care actions (Bispo Júnior & Almeida, 2023; Oliveira et al., 2017; Seidl et al., 2019).

Today, more than 40,000 PHC teams are in operation within the SUS in the whole country. The Brazilian PHC model places primary care teams at its core, particularly through the Family Health Strategy. In this format, there has been a steady leaning towards the adoption of evidence-based practices (Duncan et al., 2022).

When it comes to PHC settings, it is useful to remember some of its key characteristics: (i) first point of contact with the healthcare network, (ii) coordinator of care within the system, and (iii) provider of continuous and comprehensive care over time (Starfield et al., 2005). In this nodal position, it should be noted that it is in general consultations that many cases requiring psychological intervention are detected (Twomey et al., 2013). In addition, intensive primary care can reduce the severity of crises, the number of psychiatric hospitalizations, the time in short-term hospitalizations, and emergency admissions (Hone et al., 2022; Schwalm et al., 2022).

Beyond that, it has been argued that integrating psychological health interventions

into PHC results in better patient outcomes, less provider burden, smaller costs, and reduced mental health stigma (Kathol et al., 2014). Brief, transdiagnostic behavioral interventions, delivered within a multidisciplinary approach, have a potential to maximize impact at this level of care by addressing patients' various possible complaints when they first enter the system. Besides dealing with their psychological demands, those interventions can also foster doctor-patient relationships, and help them navigate the system to get more assistance as needed (Glover et al., 2016).

Despite the expanding awareness about the benefits to be gained from integrating empirically supported psychological interventions in general health care, it can be argued that such process has been rather slow due to, at least in part, a scarcity of interventions that fit into the existing health care environments, or of enough studies whose results recommend and support the adoption of such interventions (Glover et al., 2016).

### **Acceptance and Commitment Therapy**

Acceptance and commitment therapy (ACT, pronounced as one word) is a model of behavioral therapy that uses acceptance strategies and attention to the present moment to help clients establish a flexible and non-judgmental relationship with unwanted experiences, such as disturbing thoughts, unpleasant emotions, painful memories, or physical discomfort, engaging in actions committed to life values. It is proposed to be a transdiagnostic approach, which can be applied to a wide variety of conditions (Hayes et al., 2011).

Embedded in contextual behavioral science, ACT is philosophically based on the assumptions of functional contextualism (Hayes et al., 2012). Theoretically, it is rooted in the framework of relational frame theory (RFT), a behavioral-analytic model that aims to explain verbal behavior beyond direct contingencies and stands as a comprehensive theory of human language and cognition (Hayes et al., 2001).

The ACT approach stems from the premise that adopting inflexible reactions to internal experiences, with efforts to avoid or manage them, might offer immediate relief but over time can amplify the occurrence and intensity of undesirable experiences, ultimately constraining an individual's life. When individuals actively avoid certain experiences, they simultaneously create distance from life conditions that hold significance for them. Consequently, they detach from the very circumstances that could motivate meaningful change. In this regard, there is some evidence indicating that alterations in psychological flexibility form the foundation for clinical change (Bluett et al., 2014; Hayes et al., 2006).

ACT acts on six therapeutic processes: (i) acceptance, (ii) cognitive defusion, (iii) attention to the present moment, (iv) self as context, (v) values and (vi) committed action. In clinical practice, these processes are managed mainly using metaphors and experiential exercises, which involves, first, promoting in the client a willingness to live experiences openly, without trying to escape or evade, while realizing the insufficiency and high costs of control efforts (Barbosa & Murta, 2014; Hayes et al., 2011).

In addition, the aim is for the individual to view thoughts, feelings, and other hidden events from a detached perspective, removing the literal character that would characterize a state of cognitive fusion. Thirdly, the aim is to promote learning aimed at moving with life values as a guide, in other words, establishing verbal relationships that increase the reinforcing value of the consequences produced by behaviors consistent with these values. In this way, the person is expected to acquire more and more psychological flexibility (Barbosa & Murta, 2014; Hayes et al., 2011).

Specifically, cognitive defusion involves creating distance from one's thoughts to reduce their impact on behavior. Techniques such as observing thoughts non-judgmentally and utilizing metaphorical language are intended to help individuals detach from their

cognitive content. Acceptance, the second core process, emphasizes embracing thoughts and emotions without making efforts to control or eliminate them. This should encourage a non-judgmental stance towards internal experiences, fostering psychological flexibility. Present moment awareness directs attention to the current experience, stimulating individuals to engage fully in the here and now. This process aligns with mindfulness principles, promoting a mindful and non-reactive approach to thoughts and feelings (Hayes et al., 1999).

The self-as-context involves recognizing the observing self, distinct from one's thoughts and emotions. This process fosters a sense of perspective and helps individuals disentangle their sense of self from transient internal experiences. In turn, values clarification centers on identifying and connecting with one's core values, which can be understood as qualities and principles that guide meaningful life actions. In fact, clarifying values provides a foundation for committed action, the final core process, which involves setting goals and taking steps aligned with those values, even in the presence of difficult thoughts and emotions. It emphasizes the importance of living in accordance with one's chosen direction, promoting behavioral change and well-being (Hayes et al., 1999).

Many empirical studies of ACT seem to have direct relevance to the provision of health services in general, whether in primary care, hospital settings or as a way of influencing preventive behaviors, such as reducing smoking, among others (Dindo et al., 2017). Randomized controlled trials (RCTs) and meta-analyses point to its effectiveness for various psychological demands, many of which are frequent in hospital and primary care contexts, such as chronic pain, stress resulting from medical procedures, depression, and anxiety (Gloster et al., 2020; Hayes, 2023).

For example, Ma et al. (2023) conducted a systematic review with meta-analysis to investigate the efficacy of ACT for adults with chronic pain. A total of 21 RCTs,



conducted in clinical or community settings, involving 1962 participants, were included for analysis. Results indicated that ACT had a positive impact on various outcomes related to chronic pain. Effect sizes in terms of standardized mean differences (*SMD*) favoring ACT over comparison groups were: 0.67 for pain acceptance, 0.43 for quality of life, -0.88 for pain-related functioning, -0.45 for pain intensity, -0.35 for anxiety, and -0.74 for depression. Their findings suggest that ACT is not only effective but comparable to and, in some cases, potentially superior to other active treatments for chronic pain.

As a further example, a review by Twohig and Levin (2017) evaluated ACT as a treatment for anxiety and depression. Consolidating findings from 36 RCTs, they observed that ACT demonstrated higher efficacy compared to waitlist conditions and treatment as usual (TAU). Additionally, its effects were largely comparable to traditional cognitive behavioral therapy (CBT). Effect sizes (Cohen's *d*) varied depending on clinical and control conditions. For anxiety they ranged from  $d = 0.33$  to  $d > 1$  for mixed anxiety;  $d = 0.70$  to  $d = 1.02$  for generalized anxiety disorder (GAD);  $d = 0.72$  for panic disorder; and  $d = 0.89$  for health anxiety. The effect sizes for depression varied as well. At posttreatment, from  $d = 0.60$  to  $d = 1.17$  compared to waitlist; from  $d = 0.36$  to  $d = 0.86$  in relation to TAU; and from not significant to  $d = 1.08$  compared to CBT. Moreover, data from various trials suggested that the outcomes of ACT treatments were influenced by the enhancement of psychological flexibility.

A-Tjak et al. (2014) carried out a meta-analysis of 39 randomized clinical trials on the effectiveness of ACT. Their conclusion was that ACT is more effective than usual care or placebo and as effective as other established psychological interventions in treating anxiety disorders, depression, addiction, and somatic health problems. They reported that ACT performed better than control conditions (Hedges'  $g = 0.57$ ) in both posttreatment and follow-up. This was observed in completer and intent-to-treat analyses for primary

outcomes. Specifically, ACT was superior to waitlist ( $g = 0.82$ ), psychological placebo ( $g = 0.51$ ), and TAU ( $g = 0.64$ ). Additionally, contrasted with control conditions, ACT displayed superiority across secondary outcomes ( $g = 0.30$ ), quality of life ( $g = 0.37$ ), and process measures ( $g = 0.56$ ). No significant differences were identified between ACT and CBT ( $p = 0.140$ ) (A-Tjak et al., 2014).

More recently, Gloster et al. (2020) carried out a systematic review of 20 meta-analyses that evaluated the effectiveness of ACT. The study encompassed a total of 100 controlled effect sizes, which were categorized based on target conditions and comparison groups, involving 12,477 participants. Results revealed that ACT was efficacious across a spectrum of conditions, including but not limited to anxiety (mean effect size  $g = 0.24$ ), depression ( $g = 0.33$ ), substance use ( $g = 0.41$ ), chronic pain ( $g = 0.44$ ), and transdiagnostically ( $g = 0.46$ ). In general, ACT was superior to inactive controls as waitlist ( $g = 0.57$ ), placebo ( $g = 0.54$ ), TAU ( $g = 0.46$ ), and most active intervention conditions ( $g = 0.57$ ), and as efficacious as CBT ( $g = 0.16$ ) (Gloster et al., 2020).

A cautionary note on effect sizes is due at this point. Jacob Cohen proposed a rule of thumb for interpreting standardized mean differences (*SMD*) measured, for instance, according to his popular Cohen's  $d$  formula: very small ( $d < 0.20$ ), small ( $0.20 < d < 0.50$ ), medium ( $0.50 < d < 0.80$ ), or large ( $d > 0.80$ ). However, Cohen himself warned that those numbers were arbitrary to a degree, above all a convention, and ought to be used with caution (Cohen, 1988).

To adequately interpret effect sizes (e.g., Cohen's  $d$ , Hedges'  $g$ , Pearson's correlation coefficient  $r$ ) it is necessary to take variables in the study context into consideration. In this sense, study design (e.g., controls, randomization), field within psychology (e.g., health, clinical, social), quality of methodology (e.g., pre-registration, sample size, handling of biases), all play a part in apt interpretation. Besides, it is important

to factor in the meaning and usefulness of calculated effect sizes for the investigation. That way, the risk in using such conventional frame is acknowledged, but it is deemed beneficial when a better basis for estimating the effect size meaning may not be available (Cohen, 1988; Schäfer & Schwarz, 2019).

In practice, thus, effect sizes deemed small in Cohen's convention could still be meaningful, depending on the frame of reference to which they are contrasted. This would likely be the case if they came from, for example, a large sample, a subject for which small effects aren't uncommon, or from a series of different studies on a topic that yield a narrow range of effect sizes in the same direction. On the other hand, large effects may raise concerns about the reliability and replicability of a given study (Funder & Ozer, 2019)

Altogether, the literature seems to show a growing body of evidence supporting the versatility of ACT in addressing complex mental health challenges, underscoring its possible adaptability and effectiveness in clinical issues in general, and particularly in health psychology.

### **Study Justification**

We are not aware of a literature review that has focused on ACT-based interventions specifically in hospitals and primary care facilities, nor one that aims to cover Brazilian academic production. Thus, there is a gap that merits being filled, but there are at least two more reasons justifying the present study.

Firstly, ACT can be applied in brief and group versions, aimed at achieving results in a reduced number of sessions and with fewer human and material resources, a useful feature given the time, cost and resource constraints present in the health care context, which differs from the ordinary psychotherapeutic environment (Barreto et al., 2019; Dindo et al., 2017; Glover et al., 2016; Kyllönen et al., 2018; Strosahl et al., 2012).

Secondly, different countries have promoted the increasing integration of

behavioral-based psychological interventions, such as ACT, into the provision of health services at various levels (Robinson, 2015; Robinson & Reiter, 2016). This development suggests that this integration could also be useful in Brazil, but this movement is still incipient at best in the country. For instance, this possibility is not mentioned in the professional guidelines for the practice of psychologists in public hospital services and PHC issued by the Federal Psychology Council (Conselho Federal de Psicologia, 2019a, 2019b).

Still in the Brazilian context, when it comes to the infrequent adoption of ACT as an intervention in health care environments, one may notice that Duncan and colleagues, in their classic manual on evidence-based practice in primary care, first published in 1991, only started citing ACT in the new fifth edition. They indicate this therapy as a viable psychological intervention for cases of chronic pain or overweight and obesity and also cite Robinson et al. (2010) manual on fACT as a suggested reading (Duncan et al., 2022).

### **Study Objectives**

The research question is: Is acceptance and commitment therapy (ACT) being employed as an effective psychological intervention in hospital and primary care contexts?

Accordingly, the main objective of this systematic review of the literature is to investigate the present state of the evidence on the use of ACT interventions in non-psychiatric hospital and PHC settings, to synthesize the breadth of the current stage of empirical research on this topic.

The specific objectives are to identify: (a) country where the study was conducted (b) the research context (hospital vs. PHC); (c) the populations served and their health conditions; (d) the research designs and control groups; (e) the characteristics of the interventions; (f) the variables studied and the measurement instruments; (g) the main results achieved, in terms of effectiveness; (h) therapists who performed the interventions

and treatment integrity; and (i) adverse events reported.

It is expected that practitioners, academics, and policymakers alike, particularly in Brazil, can potentially profit from lessons conveyed by the standing literature on the theme.

### **Method**

The method of choice is the systematic literature review. Systematic reviews are important tools as they allow syntheses of available empirical evidence regarding a given topic of interest. This characteristic is useful for academic research as it provides an updated view of the findings of studies in an area of knowledge. From there, priorities can be identified, new questions can be asked, problems can be detected, and hypotheses can be tested. Systematic reviews are also of relevance to people responsible for making decisions on topics of public interest, such as health service providers, public policy makers, government agencies and even patients (Page et al., 2021a).

This literature review followed the PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) guidelines. The PRISMA 2020 statement is the most recent version of these guidelines. It consists of a checklist with 27 items, as well as specific recommendations for preparing summaries and flowcharts of systematic reviews (Page et al., 2021a, 2021b). This study was registered with PROSPERO public database of prospective systematic reviews (CRD42022320420; Cameoka et al., 2022).

### **Databases and Inclusion Criteria**

As registered in the PROSPERO database, articles published from January 1, 2000, to May 1, 2022, were searched in the ProQuest, PubMed, Virtual Health Library (BVS), Academic Search Premier, and PsycNET databases. Inclusion criteria were: (a) clinical trials; (b) clear objectives, methods, and results; (c) target population: health care clients undergoing ACT interventions in non-psychiatric hospital and primary care settings; (d)

independent variable: ACT as main psychological intervention; (e) dependent variables: any reported measures, such as depression, stress, anxiety, and quality of life, among others; (f) languages: Portuguese, English, or Spanish; and (g) publication type: peer-reviewed journal articles.

### **Search Strategy**

The primary search was conducted independently in each database, comprising articles published from January 1, 2000, to May 1, 2022. Keywords were searched in the abstract or title.

Search terms were defined based on standard descriptors (MeSH - Medical Subject Headings for international databases, and Health Sciences Descriptors - DeCS for Brazilian databases).

The search command in English was: (“acceptance and commitment therapy” OR “acceptance-based behavior therapy”) AND (“hospital\*” OR “primary care”). In Portuguese, the command was: (“terapia de aceitação e compromisso”) AND (“hospital\*” OR “atenção primária”). The corresponding search string in Spanish was: (“terapia de aceptación y compromiso”) AND (“hospital\*” OR “atención primaria”). Note that the precise syntax varied slightly depending on the database used.

### **Study Selection and Data Extraction Process**

The author and two other clinical psychology researchers independently examined the titles and abstracts of the previously selected studies to decide exclusions. The degree of initial agreement regarding the application of inclusion and exclusion criteria was over 90%. All disagreements were then settled through discussions and by consensus. Information was extracted on the country where the study was conducted; health context; participants; health conditions; numbers allocated to study conditions; research design; variables studied; measurement instruments; results; therapists and treatment integrity; and

adverse events. The author read the full-text articles to further apply eligibility criteria.

### **Data Analysis**

Data were tabulated in columns according to the following order: (a) author and date, country, context (hospital or primary care); (b) population; (c) sample size; (d) research design, control group, measurement points; (e) ACT intervention (individual, group, in-person, online); (f) variables of interest; (g) instruments; and (h) outcomes. Data were aggregated and tabulated in a table with relevant results. Data on methodological quality, on therapists, on treatment integrity, and on adverse events were reported separately. Descriptive statistics were calculated when appropriate.

### **Results**

A search of the electronic databases identified 357 records. Following the removal of duplicates, 249 titles and abstracts were screened for inclusion and 219 excluded for not meeting criteria. The reasons for exclusion were: (a) not empirical ( $n = 69$ ); ACT was not the main intervention in the study ( $n = 56$ ); not a hospital or PHC setting ( $n = 48$ ); pilot or feasibility study ( $n = 19$ ); not final clients were the aim of the intervention ( $n = 15$ ); not a clinical trial ( $n = 11$ ); and not in English, Spanish, or Portuguese language ( $n = 1$ ). In total, 30 full-text articles were obtained and screened, which resulted in 29 studies included after all criteria were applied and a further article was excluded for being in Persian, although the abstract was in English. Figure 1 shows a PRISMA flowchart of the study selection process.

Figure 1

## PRISMA Flowchart of Study Selection for the Review

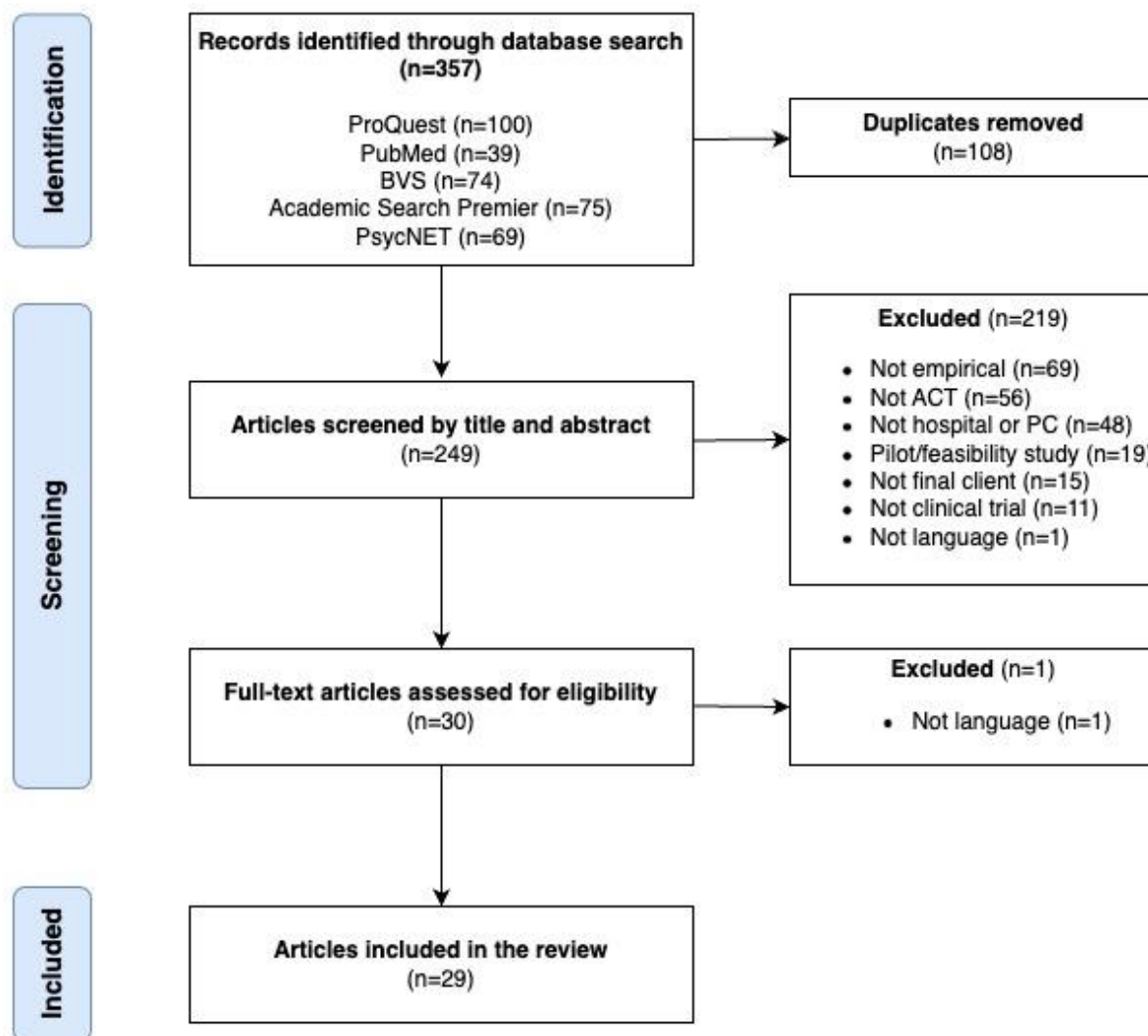


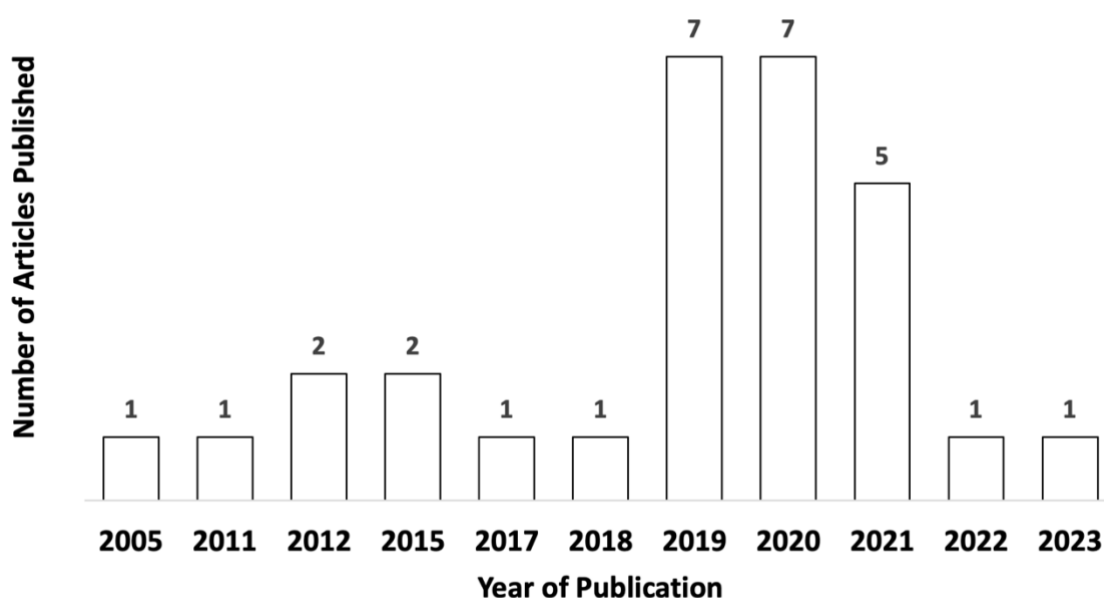
Table 1 provides a summary description of the 29 articles included in this review. It displays the main aspects that characterize the studies, namely: (a) authors, year of publication, country where it was conducted, and context (either a hospital or a PHC setting); (b) participants selected (inclusion criteria, health conditions, age); (c) number of participants allocated to each study condition; (d) study design (randomized controlled trial, quasi-experimental), type of control used, if any (e.g., TAU, other active intervention), and measurement points throughout the study (pre, mid, post treatment, and at follow-up); (e) ACT intervention format (alone, in association), mode (individual,



group, in person, through the internet), and frequency of treatment administration (number of sessions, duration); (f) dependent variables investigated (primary and secondary outcomes, mediators); (g) instruments used to measure the chosen variables; and (h) major results.

**Figure 2**

*Number of Articles in the Review by Year of Publication*



Most articles were published recently. The oldest is from 2005 and the most recent from 2023 (although it was extracted in 2022). As it can be seen in Figure 2, the trend seems to be that the number of publications is rising recently, with 21 articles appearing since 2019 (72.4%).

**Table 1***Summary of Studies Included in the Revision*

Author (year) Country Health context	Participants	Allocated	Design Control Measurement points	Intervention Mode Frequency	Variables	Instruments	Results
Abid Azam et al. (2017) Canada Hospital	Patients (no age) at risk for chronic postoperative pain and opioid use	N = 343  ACT (n = 91)  Control (n = 252)	Quasi-experimental  No treatment  Pre, post-surgery, post-discharge 1 & 2	ACT  Individual (for a minority, also Group)  1-33 sessions x 45 min	Opioid use; pain intensity; pain interference; sensitivity to pain trauma; pain catastrophizing; anxiety; depression	MED; BPI-SF; SPTS-12; PCS; HADS	In between group comparisons, both groups showed reductions in pain intensity, pain interference, pain catastrophizing, anxiety, and opioid use at post-discharge 2. In comparison to control, the ACT group showed greater reductions in opioid use, pain interference, and reductions in depressed mood. ACT group had significantly higher daily opioid use at post-discharge 1, as well as more anxiety, higher sensitivity to pain trauma, and greater prevalence of preoperative mental health conditions.
Ahmadi Ghahnaviyeh et al. (2020) Iran Hospital	Patients (>30 years) with myocardial infarction, without comorbidities.	N = 60  ACT (n = 30)  Control (n = 30)	RCT  No treatment  Pre, post, FU (6 months)	ACT  Individual  8 x 90 min	Quality of life with heart failure	MLHFQ	The overall quality of life in the ACT group after the intervention and at follow-up increased significantly. There was also a significant increase in scores on the mental health and physical health subscales in the experimental group. In the control group there was a decrease in quality of life at the same time points.

Author (year) Country Health context	Participants	Allocated	Design Control Measurement points	Intervention Mode Frequency	Variables	Instruments	Results
Arrol et al. (2022) New Zealand PHC	Patients (16-75 years) on waiting room for a PHC visit with a PHQ-2 score $\geq 2$ ; not on anti-psychotic medication, severe mental illness diagnosis, or taking an antidepressant for less than one month	N = 57  fACT (focused ACT) (n = 28)  Control (n = 29)	RCT  No treatment  Pre FU (1 week)	fACT  Individual  1 x 10 min	Depression; quality of life; emotional quality of life; psychological flexibility	PHQ-8; EQ-5D-5L; Emoqol-100; AAQ-II	Significant difference between groups in depressive symptom severity at one week as reported by PHQ-8 mean scores. No significant differences in other measures.
Bendelin et al. (2021) Sweden Hospital	Patients (> 18 years) with chronic pain > 6 months scheduled for MMRP (multimodal pain rehabilitation program) at a specialist pain clinic in a university hospital, presenting mild to moderate psychiatric symptoms	N = 103  iACT (internet-delivered ACT) (n = 49)  Control (n = 54)	Cluster-RCT  MMRP  Pre, post, post-aftercare FU (12 months)	MMRP + iACT  Group (MMRP) and Individual (iACT)  4 days x 6 weeks (MMRP + iACT) Aftercare: 11 weeks (iACT)	Pain acceptance; psychological inflexibility in pain; pain self-efficacy; psychosocial, cognitive, and behavioral components relating to chronic pain; pain intensity; physical disability; life satisfaction	CPAQ; PIPS; PSEQ; MPI; SQRP	Statistically significant effect in favor of the MMRP+iACT group on: pain acceptance (CPAQ) total scale and pain willingness subscale) post-treatment and post-aftercare; psychological inflexibility (PIPS total scale, avoidance and fusion subscale) post aftercare; affective distress (MPI subscale); pain-specific self-efficacy (PSEQ) post aftercare; pain-specific self-efficacy (PSEQ) at 1 year follow-up.
Cattivelli et al. (2021) Italy Hospital	Adults with obesity (BMI>30), without severe psychiatric diagnosis, or concurrent severe medical conditions, other than eating disorders (ED)	N = 155  ACT (n = 82)  CBT (n = 83)	IRGT (individually randomized group-treatment trial)  CBT	ACT  Group  3 x (duration not informed)	Weight, Body Mass Index; distress and dysfunctions; subjective wellbeing; symptoms of psychological problems; life functioning; risk for self-harm or harm of others; psychological flexibility and experiential	Standardized calculations; CORE-OM; AAQ-II	CBT produced higher improvement than ACT in clinical outcomes from baseline to discharge, but psychological treatment effect at follow-up was larger in the ACT condition. Only patients in the ACT condition improved their psychological flexibility and were able to maintain weight loss at follow-up.

Author (year) Country Health context	Participants	Allocated	Design Control Measurement points	Intervention Mode Frequency	Variables	Instruments	Results
			Pre, post, FU (6 months)		avoidance		
Cosio and Schafer (2015) USA PHC	Veterans who suffer from mixed idiopathic, chronic, non-cancer pain	N = 50	Quasi- experimental  –  Pre, post	ACT  Group  10 x 1 hr (weekly)	Pain severity; pain interference; permanent functional disability; negative self-statements; catastrophizing; ideations about pain; illness-focused coping; global distress	BPI; ODI; CSQ; CPCI; BSI-18	Significant difference in pain interference, illness-focused coping, and global distress were recorded upon completion of the intervention. There was no significant change in pain intensity, functional disability, wellness-focused coping, and catastrophizing behavior.
Davoudi et al. (2020) Iran Hospital	Patients with painful diabetic neuropathy (35-65 years), medicated, with depressive symptoms, without comorbidities or psychotherapy in the last 6 months	N = 40  ACT (n = 20)  Control (n = 20)	RCT  Psychoeducatio n  Pre, post, FU (3 months)	ACT  Individual  8 x 90 min	Depression; sleep quality	BDI; PSQI	In the ACT group there was a significant improvement in depressive symptoms and sleep quality. The results were maintained during follow-up.
Fernández et al. (2012) Spain Hospital	Patients scheduled to undergo laparoscopic cholecystectomy within a week before intervention, with no infectious, blood or autoimmune disease, allergy, asthma, immune deficiency, transplant, haemophilia,	N = 13  ANI (acceptance- based nursing intervention) (n = 6)  Control (n = 7)	Quasi- experimental  TAU  Pre, post (24–48 hr), or discharge (over 24–48h)	ANI + TAU  Individual  1 x 30 min	Frequency and intensity of pain; anxiety; duration of postsurgical hospitalization; believability of pain; demand of analgesics	Pain VAS; STAI; medical records	All ANI patients left the hospital within 48 hr of surgery (half after 24 hr). No TAU patient left the hospital within 24 hr, and only 42.8% within 48 hr, although TAU patients reported less post- surgical pain. On average, ANI patients stayed 36 hr while TAU ones stayed 92.57 hr. More ANI patients reported lower levels of anxiety during post-surgical recovery. When all ANI patients were discharged, they had demanded fewer analgesics than TAU patients.

Author (year) Country Health context	Participants	Allocated	Design Control Measurement points	Intervention Mode Frequency	Variables	Instruments	Results
	developmental disability						
Godfrey et al. (2020)	Adult with chronic low back pain for more than 12 weeks, without comorbidities or recent history of psychotherapeutic, physical (6 months) or injection (3 months) treatment	N = 248  PACT (Physical therapy informed by ACT) (n = 124)  Control (n = 124)	RCT  TAU  Pre, FU (3, 12 months)	PACT  Individual  2 x 60 min + 1 x 20 min (phone call)	Functional capacity; depression; anxiety; quality of life; severity of pain; general improvement; satisfaction with the therapy result; credibility of the treatment; acceptance; committed action; pain self-efficacy; economic impact	RMDQ; PHQ-9; GAD-7; PSFS; WSAS; evaluation questionnaires ; CPAQ-8; CAQ-8; PSEQ; EQ-5D-5L; SF- 12	At 3 months, PACT participants reported better outcomes for functional capacity, physical health, and treatment credibility, but at 12 months there were no significant differences between the groups. PACT was considered acceptable to patients and physicians and feasible to implement. Physical therapists successfully incorporated psychological principles and treatment was delivered with high (≥80%) fidelity.
Haugmark et al. (2021)	Age 20–50 years, diagnosed fibromyalgia, widespread pain for at least 3 months, with no inflammatory rheumatic disease, severe psychiatric disorder, disease that did not allow physical activity, work for more than 2 years	N = 170  ACT (n = 85)  Control (n = 85)	RCT  TAU  Pre, post, FU (3, 12 months)	VTP (Vitality Training Programme, a mindfulness- and acceptance-based intervention) + Physical Activity  Group  10 x 4 hr (booster session after approx. 6 months)	Global impression of change; pain; fatigue; sleep quality; psychological distress; mindfulness; physical activity; motivation and barriers for physical activity; work ability; health-related quality of life; overall health	PGIC; Pain, fatigue and sleep quality numerical rating scale; GHQ-12; FFMQ; Nord- Trøndelag Health Study; exercise beliefs and habits questionnaire; WPAI:GH; EQ- 5D- 5L; VAS	The intervention was not more effective than TAU. No statistically significant between-group differences were found in any disease-related secondary outcomes. There were significant differences in patient's tendency to be mindful and perceived benefits of exercise in favour of the intervention group.

Author (year) Country Health context	Participants	Allocated	Design Control Measurement points	Intervention Mode Frequency	Variables	Instruments	Results
Hoffmann et al. (2021) Denmark Hospital	Patients $\geq 18$ years diagnosed with severe health anxiety, being the principal diagnosis if comorbid disorders were present	N = 101  iACT (internet-delivered ACT) (n = 53)  Control (n = 48)	RCT  Internet-delivered discussion forum  Pre, mid, post, FU (6 months)	iACT  Individual  7 consecutive modules over 12 weeks of treatment	Changes in self-reported health anxiety symptoms; depression; somatic symptoms; quality of life; psychological flexibility; negative effects; adherence; patient activity; treatment satisfaction	WI-7; SHA1; SCL-92; WHO-5; AAQ-II; NEQ; completed modules, logins, worksheets, messages	A mean difference in change over time of 19.0 points on the WI-7, and a large, standardized effect size ( $d = 0.80$ ) at FU. At the same time point, compared to control, twice as many patients in iACT were no longer clinically diagnosed (35% vs. 16%). Few and insignificant adverse events were reported.
Jabbarifard et al. (2019) Iran Hospital	Patients with thalassemia major (18–35 years old), with symptoms of stress, without comorbidities, not using psychiatric medication or other psychotherapy	N = 40  ACT (n = 20)  Control (n = 20)	RCT  No treatment  Pre, post, FU (3 months)	ACT  Individual  8 x 90 min	Stress; resilience; quality of life	PSS; CD-RISC; WHOQOL	At the end of the intervention, the ACT group's results were significantly higher in perceived stress, resilience, and quality of life, with most of the changes attributed to the impact of the therapy. Furthermore, the intragroup analysis revealed that the positive effect of therapy on these variables was significant after the intervention and at follow-up.
Javadi et al. (2019) Iran Hospital	Patients with migraine diagnosis, (20–45 years old), not suffering from other physical illnesses or severe psychiatric disorders	N = 45  ACT (n = 15)  MBSR (mindfulness-based stress reduction) (n = 15)	Quasi-experimental  No treatment  Pre, post, FU (3 months)	MBSR (Group 1) and ACT (Group 2)  Group  8 x 90 min	Pain; quality of life	MPQ; SF-36	Mean scores for MBSR and ACT experimental groups were significantly different from the control group in the post-test and follow-up in terms of severity of pain and health-related quality of life. Mean scores between the two experimental groups did not differ significantly.

Author (year) Country Health context	Participants	Allocated	Design Control Measurement points	Intervention Mode Frequency	Variables	Instruments	Results
Kolahdouzan et al. (2020)	Adult cancer patients experiencing death anxiety	Control (n = 15)  N = 28  ACT (n = 14)  Control (n = 14)	Quasi- experimental  Writing exercises ("placebo")  Pre, post, FU (2 months)	ACT  Group  7 x (duration not informed)	Quality of life; attitude towards death; psychological flexibility	WHOQOL- Bref; DAP-R; AAQ-II	Compared to the control group, the ACT group showed a significant decrease in the "fear of death" and "death avoidance" dimensions of attitude toward death and a significant increase in the "mental health" dimension of quality of life. The variation in psychological flexibility was not significant.
Kuwabara et al. (2020)	Patients aged 20–64 years, main complaint of nonvertiginous dizziness or unsteadiness lasting ≥ 3 months; neither vertigo nor dizziness caused by organic brain diseases	N = 27	Quasi- experimental  –  Pre, post, FU (3, 6 months)	ACT + vestibular rehabilitation  Group  6 x 120 min	Dizziness severity; frequency of vestibular balance; anxiety; depression; experiential avoidance; mindfulness	DHI; VSS; HADS; AAQ-II; FFMQ	All patients completed the program, 25 (92.6%) remained at 6 months FU, and scores significantly declined, with a large effect size (d=1.11) for dizziness severity (DHI). At 6 months FU, 11 patients (40.7%) achieved remission, 16 (59.3%) achieved treatment response, and 20 (74.1%) achieved remission and/or treatment response.

Author (year) Country Health context	Participants	Allocated	Design Control Measurement points	Intervention Mode Frequency	Variables	Instruments	Results
Mak et al. (2020) China PHC	Aged 18 years or above, smoked at least one cigarette per day in the past 30 days	N = 144  ACT (n = 70)  Control (n = 74)	RCT  Standard self-help materials  FU (3, 6, 12 months)	ACT + standard self-help materials  Individual (in-person and telephone)  3 x 15–20 min (1 face-to-face; 2 by telephone)	Abstinence; nicotine dependence; experiential avoidance; willingness to experience thoughts, feelings, and sensations; exhaled CO and urinary cotinine; treatment fidelity	Self-reported 7-day point prevalence; FTND; AAQ-II; AIS; micro smokerlyzer CO monitor; ACT core competency rating form	There was no significant difference between intervention and control groups in the self-reported 7-day point prevalence quit rate at the 12-month FU. ACT group showed greater improvements in the participants' readiness to quit smoking and psychological flexibility.
McCracken et al. (2005) UK Hospital	Adults with pain for more than 3 months, related distress and disability, not appropriate for further medical tests or invasive procedures, without psychiatric or neurobehavioral conditions which would prevent benefit from treatment	N = 129	Quasi-experimental  –  Pre, post, FU (3 months)	ACT + Physiotherapy + MTAU (medical treatment as usual)  Group  5 days per week / 6 hr per day	Pain intensity; depression; pain-related anxiety; physical disability; psychosocial disability; daily rest due to pain (hours); number of pain meds; general practitioner visits; timed 10-meter walks; sit to stand (frequency/1 min); percentage working	Pain numeric scale; BDI; PASS; SIP; CPAQ; Counting time and number of repetitions of certain physical activities	Significant improvements in emotional, social, and physical functioning, and healthcare use were demonstrated following treatment. The majority of improvements continued at 3-months FU. Improvements in most outcomes during treatment were correlated with increases in acceptance, supporting the proposed process of treatment.



Author (year) Country Health context	Participants	Allocated	Design Control Measurement points	Intervention Mode Frequency	Variables	Instruments	Results
Mo'tamedi et al. (2012) Iran Hospital	Female patients (19-55 years) diagnosed with chronic headache, no history of seizures, facial neuralgia or mental disorder, no substance abuse	N = 30 ACT (n = 15) Control (n = 15)	Quasi-experimental MTAU Pre, post	ACT + MTAU Group 8 x 90 min	Perception of pain intensity; functional disability due to pain; emotional suffering	MPQ-SF; MIDAS; STAI-T	Compared to the control group, in the ACT group there was a significant reduction in functional disability and emotional suffering, but not in the sensory aspect of pain perception.
Najvani et al. (2015) Iran Hospital	Women with stage I, II, III breast cancer, aged 20–60, without metastasis or chronic diseases	N = 16 ACT (n = 8) Control (n = 8)	Quasi-experimental No treatment Pre, post, FU (1 month)	ACT Group 8 x 120 min	Depression; psychological flexibility	BDI-II; AAQ-II	The ACT group significantly decreased depression score and increased flexibility score compared to the control group between pre-test, post-test and follow-up.
Pedersen et al. (2019) Denmark Hospital	Patients aged 20–50 years with multi-organ bodily distress syndrome (BDS) of at least 2 years' duration leading to moderate or severe impairment in daily living	N = 180 Extended ACT (n = 59) EC (enhanced care) (n = 60) Brief ACT	Randomized three-armed trial EC (control 1) Brief ACT (control 2) Pre, mid, post, FU (20 months)	Extended ACT Group 9 x 180 min	Global health improvement; physical, mental, and social health; depression; anxiety; somatic symptoms; symptom score; illness worry; disability	CGI; SF-36; SCL-92; BDS checklist; WI-7; WHODAS 2.0	Improvement on global health after Extended ACT was significantly greater than after EC. No significant differences were found between Brief ACT and EC. An equal number of patients across all three groups (approx. 41%) reported no change on the primary outcome. Of the 18 secondary outcomes, the only significant difference found was for physical functioning in the comparison of Extended ACT with EC.

Author (year) Country Health context	Participants	Allocated  (n = 61)	Design Control Measurement points	Intervention Mode Frequency	Variables	Instruments	Results
Rose et al. (2023) UK Hospital	Adults diagnosed with one of four specific muscle diseases for more than six months	N = 155 ACT (n = 77) Control (n = 78)	Two-arm, randomized, multicenter, parallel design  MTAU Pre, mid (3, 6, and 9 weeks after randomization)	ACT + MTAU  Individual 4 email modules (written and audio files) 45–90 min to complete, supported by five 15–30 min telephone sessions	Quality of life; activities; independence; social and emotional functioning; body image; social adjustment; anxiety; depression; disability; acceptance; receptive state of mind; engagement in valuable actions; disease severity; impression of change; treatment satisfaction; therapeutic alliance	INQoL; WSAS; HADS; HAQ-DI; AAQ-II; MAAS; CAQ; IBM-FRS; PGIC; patient's rating scale; ACT-FM; ACTMuS	ACT in addition to usual care was effective in improving quality of life and psychological and social outcomes in patients with muscle diseases. At all three time points, the adjusted group difference significantly favoured the intervention group with moderate to large effect sizes. Mood, functional impairment, and acceptance also showed significant differences between groups.
Sadri Damirchi et al. (2019) Iran Hospital	Adult women with Body Dysmorphic Disorder (BDD) associated to body deformities derived from breast cancer treatment	N = 30 ACT (n = 15) Control (n = 15)	Quasi-experimental  No treatment  Pre, post FU (time not informed)	ACT  Individual 8 x 60 min	BDD symptoms	BDD-YBOCS	Compared to control, ACT reduced physical dissatisfaction and fear of evaluation in the post measurement.
Sahebari et al. (2019) Iran Hospital	Female patients diagnosed with systemic lupus erythematosus	N = 24 ACT (n = 12) Control (n = 12)	Quasi-experimental  MTAU Pre, post	ACT + MTAU  Individual 8 x 90 min	Hopelessness; psychological suffering; fatigue	BHS; K-10; FSS	Compared to the control group, in the ACT group there was a significant reduction in hopelessness, psychological distress and fatigue.

Author (year)	Country Health context	Participants	Allocated	Design Control Measurement points	Intervention Mode Frequency	Variables	Instruments	Results
Sheibani et al. (2019)	Iran	Patients (35–55 years) diagnosed with coronary heart disease, without comorbidities or history of psychiatric condition	N = 30 ACT (n = 15) Control (n = 15)	Quasi-experimental No treatment Pre, post	ACT Individual 8 x 60 min	Emotional regulation; self control	CERQ; BSCS	ACT had a significant effect on the total score of positive (acceptance, shifting focus, etc.) and negative (rumination, guilt, etc.) emotional regulation strategies, but no significant differences were observed in terms of self-control.
Sianturi et al. (2018)	Indonesia	Patients suffering from cerebrovascular accident	N = 33	Quasi-experimental – Pre, post	ACT and relaxation (trained nurses) Individual (not informed)	Anxiety	HARS	Combining relaxation techniques with ACT significantly reduced anxiety levels, from moderate to mild.
Trindade et al. (2020)	Portugal	Women (35–70 years old) with nonmetastatic breast cancer, without current suicidal ideation, substance abuse, borderline personality disorder, dementia, and developmental disorders	N = 49 ACT (n = 18) Control (n = 31)	Quasi-experimental TAU Pre, post	ACT + MBSR (mindfulness-based stress reduction) + CFT (compassion focused therapy) Group 8 x 90–120 min	Quality of life; depression; anxiety; stress	WHOQOL-Bref; DASS-21	There was a large effect size for psychological health (g = 0.79). The experimental group also improved on physical health (g = 0.16), quality of social relationships (g = 0.42), depression symptoms (g = 0.42), and stress (g = 0.32). Participants reported that the program improved the way they deal with difficulties. There was a 100% retention on the experimental group.
Vakilian et al. (2019)	Iran	Pregnant women aged 18–35, second/third trimester, singleton pregnancy, no chronic diseases, miscarriage,	N = 44 ACT (n = 22)	RCT TAU Pre, post	ACT Group 8 x 90 min	Pregnancy-related fear, concern, and anxiety; quality of life	PRAQ; SF-36	Anxiety decreased after the intervention, but increased at follow-up, although to a lower level than before intervention. Quality of life improved after intervention but worsened at follow-up.

Author (year) Country Health context	Participants	Allocated	Design Control Measurement points	Intervention Mode Frequency	Variables	Instruments	Results
PHC	preterm labor, or any health abnormalities	Control (n = 22)	FU (1 month)				
Wetherell et al. (2011)	Individuals aged between 18–89 years old, reporting chronic nonmalignant pain of any type for at least 6 months	N = 114 ACT (n = 57) Control (n = 57)	RCT CBT Pre, post, FU (6 months)	ACT + TAU Group 8 x 90 min	Pain interference; pain severity; pain acceptance; pain anxiety; emotional distress; depression; physical activity; health-related quality of life; treatment satisfaction; belief in control over pain	BPI; SF-12; MPI; BDI-II; PASS; CSQ; CPAQ-R; SOPA	ACT participants improved on pain interference, depression, and pain-related anxiety. There were no significant differences between conditions on any outcome variables. ACT participants who completed treatment reported significantly higher levels of satisfaction than CBT participants.
USA PHC							
Witlox et al. (2021)	Individuals aged between 55-75 years with mild to moderately severe anxiety symptoms	N = 314 ACT (n = 150) Control (n = 164)	Single-blind cluster RCT Face-to-face CBT Pre, FU (6, 12 months)	Blended ACT Individual 4 face-to-face sessions + 9 online lessons 15–30 min/day 9–12 weeks	Anxiety; positive mental health; depression; functional impairment; GAD; panic disorder; agoraphobia; specific phobia; social phobia; obsessive-compulsive disorder; posttraumatic stress disorder; illness anxiety disorder; treatment satisfaction; treatment integrity	GAD-7; MHC-SF; PHQ-9; SDS; MINI-Plus; CSQ-8; treatment integrity checklist	Within group anxiety symptom severity did not differ between ACT and CBT. In both, anxiety scores significantly decreased from baseline to posttreatment, effect sizes were large, and reduction was maintained at the 12-month follow-up. Improvements in positive mental health were better sustained in the long term in the ACT group. Treatment satisfaction was higher for ACT.
Netherlands Hospital							

*Note.* PHC = primary health care; FU = follow-up; AAQ-II = Acceptance and Action Questionnaire II; ACT-FM = ACT Fidelity Measure; ACTMuS = Acceptance and commitment therapy for muscle disease; AIS = Avoidance and Inflexibility Scale; BDD-YBOCS = Yale-Brown Obsessive-Compulsive Scale modified for Body Dysmorphic Disorder; BDI = Beck Depression Inventory; BDI-II = Beck Depression Inventory II; BHS = Beck Hopelessness Scale; BPI = Brief Pain Inventory; BPI-SF = Brief Pain Inventory–Short Form; BSCS = Brief Self-Control Scale; BSI-18 = Brief Symptom Inventory 18; CAQ-8 = Committed Action Questionnaire-8; CD-RISC = Conner and Davidson Resilience Scale; CERQ = Cognitive Emotion Regulation Questionnaire; CGI = Clinical Global Improvement; CORE-OM = Clinical Outcome in Routine Evaluation-Outcome Measure; CPAQ = Chronic Pain Acceptance Questionnaire; CPAQ-8 = Chronic Pain Acceptance Questionnaire-8; CPAQ-R = Chronic Pain Acceptance Questionnaire-Revised; CPCI = Chronic Pain Coping Inventory - Short Form; CSQ = Coping strategies

Questionnaire - Catastrophizing Scale; CSQ-8 = Client Satisfaction Questionnaire; DAP-R = Death Attitude Profile-Revised; DASS-21 = Depression Anxiety Stress Scale-21; DHI = Dizziness Handicap Inventory; Emoqol-100 = single question on the emotional quality of life; EQ-5D-5L = EuroQol standardized measure of health-related quality of life; FFMQ = Five Facet Mindfulness Questionnaire; FSS = Fatigue Severity Scale; FTND = Fagerstrom Test for Nicotine Dependence; GAD-7 = Generalized Anxiety Disorder-7; GHQ-12 = General Health Questionnaire-12; HADS = Hospital Anxiety and Depression Scale; HAQ-DI = Stanford Health Assessment Questionnaire Disability Index; HARS = Hamilton Anxiety Rating Scale; iACT = Internet-delivered acceptance and commitment therapy; IBM-FRS = Inclusion Body Myositis Functional Rating Scale; INQoL = Individualised Neuromuscular Quality of Life Questionnaire; K-10 = Kessler Psychological Distress Scale; MAAS = Mindfulness Attention Awareness Scale; MED = morphine equivalent dose; MHC-SF = Mental Health Continuum-Short Form; MIDAS = Migraine Disability Assessment Scale; MINI-Plus: Mini-International Neuropsychiatric Interview-Plus; MLHFQ = Minnesota Living with Heart Failure Questionnaire; MPI = Multidimensional Pain Inventory; MPQ = McGill Pain Questionnaire; MPQ-SF = McGill Pain Questionnaire - Short Form; NEQ = Negative Effects Questionnaire; ODI = Oswestry Disability Index; PASS = Pain Anxiety Symptoms Scale-Short Form; PCS = Pain Catastrophizing Scale; PEG = Pain Intensity and Interference With Enjoyment of Life and General Activity; PEPPI = Perceived Efficacy in Patient-Physician Interactions; PGIC = Patient Global Impression of Change; PHQ = Patient Health Questionnaire; PIPS = Psychological Inflexibility in Pain Scale; PRAQ = Pregnancy-Related Anxiety Questionnaire; PSEQ = Pain Self-Efficacy Questionnaire; PSFS = Patient-Specific Functional Scale; PSQI = Pittsburgh sleep quality index; PSS = Perceived Stress Scale; RMDQ = Roland Morris Disability Questionnaire; SCL-92 = Symptom Checklist-92; SDS = Sheehan Disability Scale; SF-12 = MOS Short Form 12v2; SF-36 = Rand Short Form Health Survey-36; SHAI = Health Anxiety Inventory Short-form; SIP = Sickness Impact Profile; SOPA = Survey of Pain Attitudes; SPTS-12 = Sensitivity to Pain Traumatization Scale-12; SQRP = Swedish Quality Registry for Pain Rehabilitation; STAI-T = State-Trait Anxiety Inventory-Trait; VAS = Visual Analog Scale; VSS = Vertigo Symptom Scale - short form; WI-7= Whiteley-7 Index of health anxiety; WHO-5 = World Health Organization Well-being Index; WHODAS = World Health Organization Disability Assessment Schedule; WHOQOL = World Health Organization Quality of Life Questionnaire; WHOQOL-Bref = Abbreviated World Health Organization Quality of Life Questionnaire; WPAI:GH = Work Productivity and Activity Impairment General Health V.2.1; WSAS = Work and Social Adjustment Scale.

## Countries and Health Contexts

Considering the countries where the studies were conducted, 11 (37.9%) were from Iran, mostly in hospitals (Ahmadi Ghahnaviyeh et al., 2020; Davoudi et al., 2020; Jabbarifard et al., 2019; Javadi et al., 2019; Kolahdouzan et al., 2020; Mo'tamedi et al., 2012; Najvani et al., 2015; Sadri Damirchi et al., 2019; Sahebari et al., 2019; Sheibani et al., 2019), but Vakilian et al., (2019) in PHC. Then, there were three studies in hospitals from the UK (Godfrey et al., 2020; McCracken et al., 2005; Rose et al., 2023), two in PHC from the USA (Cosio & Schafer, 2015; Wetherell et al., 2011), and two in hospitals from Denmark (Hoffmann et al., 2020; Pedersen et al., 2019).

The remaining articles reporting research done in hospitals were from Canada (Abid Azam et al., 2017), Sweden (Bendelin et al., 2021), Italy (Cattivelli et al., 2021), Spain (Fernández et al., 2021), Japan (Kuwabara et al., 2020), Indonesia (Sianturi et al., 2018), Portugal (Trindade et al., 2020), and the Netherlands (Witlox et al., 2021). Besides, studies from China (Mak et al., 2020), New Zealand (Arrol et al., 2022), and Norway (Haugmark et al., 2021) were performed in PHC contexts.

Table 2 shows that, in the review sample, Iran alone produced more ACT studies related to hospitals and PHC contexts than European, anglophone or other Asian countries. Besides, it should be noted that there was no study from Brazil or even Latin America.

**Table 2**

*Number of Studies According to Health Context and Selected Geographic Distribution*

	Hospitals	PHC	Total
Iran	10 (43.5%)	1 (16.7%)	11 (37.9%)
European (except UK)	7 (30.4%)	1 (16.7%)	8 (27.6%)
Anglophone	4 (17.4%)	3 (50.0%)	7 (24.1%)
Other Asian	2 (8.7%)	1 (16.7%)	3 (10.3%)
Total	23 (100 %)	6 (100 %)	29 (100 %)

## Participants and Health Conditions

The total number of participants in the included articles reached 2,772, ranging from 13 to 343 per study ( $M = 95.6$ ;  $SD = 88.3$ ). The number of participants undergoing some sort of ACT intervention was 1,374, ranging from 6 to 150 per study ( $M = 47.4$ ;  $SD = 39.4$ ). Regarding the health context, six studies belonged to a primary care environment (Arrol et al., 2022; Cosio & Schafer, 2015; Haugmark et al., 2021; Mak et al., 2020; Vakilian et al., 2019) and the remaining 23 occurred in hospitals.

ACT interventions targeted individuals of both sexes due to various health conditions and situations. Within hospital care, these were pain (Abid Azam et al., 2017; Bendelin et al., 2021; Davoudi et al., 2020; Godfrey et al., 2020; Javadi et al., 2019; McCracken et al., 2005; Mo'tamedi et al., 2012), the single most frequent health condition in the analyzed studies; cardiovascular disease (Ahmadi Ghahnaviyeh et al., 2020; Sheibani et al., 2019; Sianturi et al., 2018); psychological distress (Hoffmann et al., 2020; Witlox et al., 2021); obesity (Cattivelli et al., 2021); laparoscopic cholecystectomy (Fernández et al., 2012); thalassemia major (Jabbarifard et al., 2019); dizziness (Kuwabara et al., 2020); cancer (Kolahdouzan et al., 2020; Najvani et al., 2015; Trindade et al., 2020); bodily distress syndrome (BDS; Pedersen et al., 2019); muscle disease (Rose et al., 2023); body dysmorphic disorder (Sadri Damirchi et al., 2019); and systemic lupus erythematosus (Sahebari et al., 2019). In PHC, interventions were targeted towards chronic pain (Cosio & Schafer, 2015; Haugmark et al., 2021; Wetherell et al., 2011); psychological distress (Arrol et al., 2022; Vakilian et al., 2019); and nicotine dependence (Mak et al., 2020).

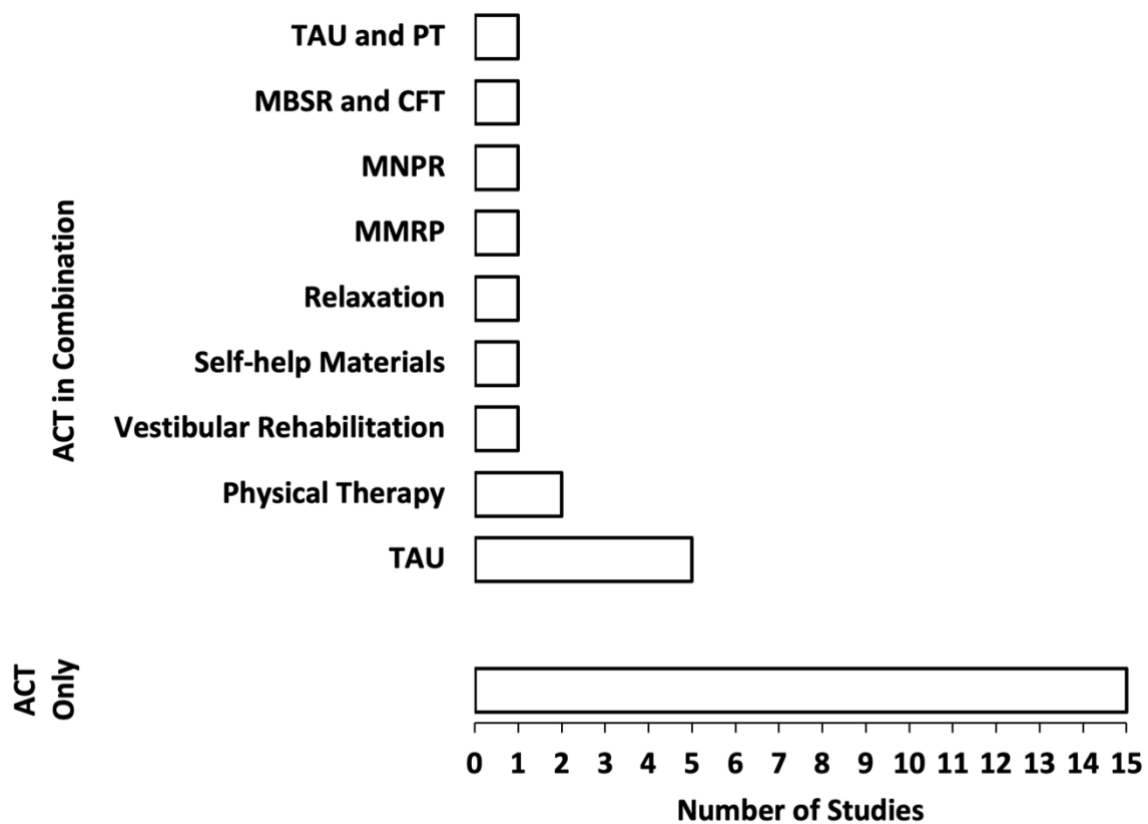
## ACT Interventions

ACT was used as the only intervention in 15 (55.2%) studies (Figure 3). The remaining 14 studies used each some combination between ACT and other types of intervention, psychological, medical, or otherwise: (a) treatment as usual (TAU), in five of

them (Fernández et al., 2012; Mo'tamedi et al., 2012; Rose et al., 2023; Sahebari et al., 2019; Wetherell et al., 2011); (b) multimodal pain rehabilitation program – MMRP (Bendelin et al., 2021); (c) medical, nutritional, and physical rehabilitation (Cattivelli et al., 2021); (d) physical therapy (Godfrey et al., 2020; Haugmark et al., 2021); (e) vestibular rehabilitation (Kuwabara et al., 2020); (f) self-help materials (Mak et al., 2020); and (g) relaxation (Sianturi et al., 2018).

**Figure 3**

*ACT Interventions Alone or in Combination by Number of Articles*



*Note.* ACT = acceptance and commitment therapy; CFT = compassion focused therapy; MBSR = mindfulness-based stress reduction; MMRP = multimodal pain rehabilitation program; MNPR = medical, nutritional, and physical rehabilitation; TAU = treatment as usual.

Additionally, Trindade et al. (2020) used mixed intervention model of ACT alongside with mindfulness-based stress reduction – MBSR (Kabat-Zinn & Hanh, 2009)



and compassion focused therapy – CFT (Gilbert, 2009). In turn, McCracken et al. (2005) resorted to an intervention that combined ACT with both TAU and physical therapy. Finally, it should be stressed that only Bendelin et al. (2021) and Trindade et al. (2020) used other psychological interventions as adjuncts to ACT, and that Haugmark et al. (2021) Vitality Training Programme (VTP) is a blended mindfulness and ACT-based intervention.

ACT intervention protocols also varied substantially. In 14 instances, individual sessions were the intervention mode of choice. The most frequent kind of individual intervention was eight sessions of 60 or 90 minutes, found in six studies, all from Iran (Ahmadi Ghahnaviyeh et al., 2020; Davoudi et al., 2020; Jabbarifard et al., 2019; Sadri Damirchi et al., 2019; Sahebari et al., 2019; Sheibani et al., 2019). Interestingly, this structure and basic elements seem to be derived from a protocol first developed for the treatment of obsessive-compulsive disorder – OCD (Twohig, 2004).

Still in the individual format, Arrol et al. (2022) employed a very brief model (one 10-minutes session), called focused acceptance and commitment therapy – fACT (Strosahl et al., 2012). Other studies also that used brief ACT formats were Fernández et al. (2012), one 30-minutes session; Godfrey et al. (2020), two 60-minutes sessions plus a 1-hour phone call; Mak et al. (2020), one face-to-face and two telephone sessions of 15–20 minutes; Rose et al. (2023), guided self-help program comprised of four 45- to 90-minutes modules (written and audio files) accompanied by five 15- to 30-minutes phone support sessions; and Witlox et al. (2021), four face-to-face sessions (no duration specified) plus nine online lessons, to be completed in 9 to 12 weeks, given participants would spend 15 to 30 minutes a day on each of them.

An individual internet-delivered intervention (dubbed iACT) was chosen by Hoffmann et al. (2021). It consisted of seven consecutive self-paced modules that should

be completed in 12 weeks. In turn, Sianturi et al. (2018) informed neither the frequency nor the duration of their intervention.

A variety of group intervention formats were presented in 14 studies. Six of them utilized eight 90- or 120-minutes sessions, which was the most frequent group format (Javadi et al., 2019); Mo'tamedi et al., 2012; Najvani et al., 2015; Trindade et al., 2020; Vakilian et al., 2019; Wetherell et al., 2011). Slightly different formats were utilized by Cosio and Schafer (2015), who resorted to 10 weekly 1-hour sessions, Haugmark et al. (2021), who adopted ten 4-hours sessions supplemented by one additional session six months later, and Kolahdouzan et al. (2020), who reported having used a 7-sessions protocol, but failed to disclose the time dispensed on each.

In turn, McCracken et al. (2005) employed 6-hours sessions five days a week, through either a 3- or 4-week residential program, or a 3-week hospital-based format. Diversely still, Pedersen et al. (2019) employed two distinct ACT intervention conditions: “Brief ACT”, a brief one-day workshop plus one consultation; and “Extended ACT”, consisting of nine 180-minutes group sessions.

Three studies mixed individual and group formats in their ACT interventions. Abid Azam et al. (2017) conducted up to 33 individual 45-minutes sessions ( $M=4.9$ ), but also applied a group format for a minority of participants. In the Cattivelli et al. (2021) study, there were three group sessions (the duration was not informed) alongside with a thorough mostly individualized rehabilitation program (diet, nutritional education, physical activities), which was also available to the control group.

The other mixed mode intervention was conducted by Bendelin et al. (2021), who used an unusually complex setup of individual internet-delivered ACT interventions together with a group multimodal pain rehabilitation program (MMRP), which is an interdisciplinary biopsychosocial treatment that combined psychological, medical,

physical, and occupational interventions, based on CBT, but including some ACT sessions.

Their protocol was comprised of two phases. In phase one, participants underwent 60- to 120-minutes group MMRP sessions, four days a week, for six weeks, intermingled with individual iACT materials. These consisted of weekly assignments of educational texts and exercises enriched with multimedia, available through a website, organized in 15-minutes chapters, or mindfulness exercises to be listened to repeatedly (Bendelin, et al., 2021).

The second phase of the Bendelin et al. (2021) study started one month after the end of phase one. It was a 11-week long iACT only aftercare, with mandatory and optional modules. Participants were provided with weekly educational content and additional exercises aligned with the face-to-face MMRP, enhanced with multimedia elements. Available on a website there were thematic therapeutic exercises, mindfulness exercises, and guiding questions, in approximately half an A4 page, with interactive worksheets for homework assignments, physical exercise diary, supplementary elucidating materials, and exercises. A psychologist trained in ACT offered feedback and remained available online for inquiries. Continuous practice, problem-solving, and goal-oriented focus were emphasized (Bendelin et al., 2021).

### **Therapists and Treatment Integrity**

From the point of view of the consistency of the interventions described in this review, as well as the range of possibilities available when it comes to actual delivery in health care settings, it is relevant to know who the therapists in each trial were. Besides, it is also important to report procedures adopted by researchers to increase treatment integrity across different experimental conditions, therapists, and protocols. On one end of the spectrum, seven articles, all from Iran, disclosed no information about either of these (Ahmadi Ghahnaviyeh et al., 2020; Jabbarifard et al., 2019; Javadi et al., 2019;

Kolahdouzan et al., 2020; Sadri Damirchi et al., 2019; Sahebari et al., 2019; Sheibani et al., 2019).

Conversely, less than half the studies (44.8%;  $n = 13$ ), from nine different countries, disclosed both who did the interventions and measures taken to enhance integrity between therapists, fidelity to protocols, and coherence with ACT tenets. Another nine studies fully reported only the therapists involved, but no or scarcely documented procedures, typically a short protocol (Table 3).

**Table 3**

*Therapists and Treatment Integrity Procedures by Study*

Authors (year)	Therapists Treatment Integrity Procedures
Abid Azam et al. (2017)	Registered clinical psychologist with 10 years ACT experience and/or one of two supervised PhD-level clinical psychology graduate students.  Not disclosed.
Arrol et al. (2022)	A family practice resident and a mental health counsellor who received two hours of training.  Not disclosed. Protocol available (scripted intervention).
Bendelin et al. (2021)	Psychologists, physicians, physiotherapists, and occupational therapists gave synchronized treatments with a CBT/ACT approach and collaborated in assessment, treatment planning and evaluation. A psychologist trained in ACT gave feedback on exercises and homework and was available online for questions.  Not disclosed (“continuous process evaluation”).
Cattivelli et al. (2021)	Two licensed and experienced clinical psychologists, trained in ACT and CBT and blinded to the final research aims.  Interventions were performed according to guidelines. Sessions were audiotaped and 20% randomly chosen to be coded for fidelity. Two bachelor-level observers blinded to conditions received coding training of approximately eight 1-h sessions, checking similar interventions under the supervision of a senior psychologist and ending the training only after achieving 80% of the internal agreement for two subsequent sessions. They independently coded the sessions to evaluate the adherence to protocol, coverage of contents, and use of additional strategies. Minimum of 80% reliability: lower level of agreement meant data were discarded.
Cosio and Schafer (2015)	Psychology trainee therapists trained to work with veterans and a licensed Veterans Affairs psychologist certified in ACT.  Therapists used standardized manuals and received weekly supervision by a licensed clinical psychologist. Feedback, coaching, and consultations with trainee

Authors (year)	Therapists Treatment Integrity Procedures
	therapists were provided throughout the interventions to ensure fidelity of delivery.
Davoudi et al. (2020)	A clinical psychologist expert in ACT and another in behavioral cognition (control group).  Session audios were recorded, and content matched with protocol. Between 83–95% of the protocols was performed in each session.
Fernández et al. (2012)	Nurse trained in acceptance-based interventions.  Acceptance-based protocol scripted word-for-word and audio-taped. Two independent observers rated adherence on a 0-10 scale. Mean adherence was 9.5, inter-observer agreement 95% ( $kappa [w] = .91$ ).
Godfrey et al. (2020)	Physical therapists received a manual and 2-day face-to-face training program, followed by ongoing monthly group supervision from a clinical/health psychologist and a physical therapist.  A random sample, stratified by session (initial face-to-face, 2-week face-to-face, 1-month telephone call) and physical therapist, of 20% of the audio-recorded PACT sessions was rated by 2 trained independent assessors. At least 1 session per physical therapist was assessed. The fidelity assessment showed that few ACT-consistent methods were delivered.
Haugmark et al. (2021)	Experienced nurses and physiotherapists, certified by a 1-year post-graduate training program.  Facilitators followed a standardized manual with a thorough program description and monitored the attendance throughout the program.
Hoffmann et al. (2021)	Four psychologists and a trainee psychology student provided written clinical guidance in iACT.  Guidance was not restricted by predetermined templates Assessments were video recorded, rated, and discussed in supervision. Treatment and technical issues were also discussed at weekly supervisions. External supervisor with extensive experience with internet-delivered treatment and health anxiety participated monthly.
Kuwabara et al. (2020)	A psychiatrist (experience: 8 years psychiatry, 4 years CBT for chronic non-organic dizziness, 1 year ACT) and a clinical psychologist (experience: 5 years clinical psychology, 3 years CBT for chronic non-organic dizziness, inexperienced in ACT).  No checklist used to assess adherence to treatment manual. Another therapist was present during sessions (not identified), confirming that the ACT program was implemented based on the manual.
Mak et al. (2020)	Experienced health counselor trained in ACT for smoking cessation.  Sessions were audio-recorded and random samples (15–20%) selected by two independent reviewers experienced in ACT and using the ACT core competency rating form, who scrutinized completeness and adherence to protocol. Discrepancies were discussed for modification.

Authors (year)	Therapists Treatment Integrity Procedures
McCracken et al. (2005)	<p>Physiotherapists, occupational therapists, a nurse, physicians, and clinical psychologists provided the services.</p> <p>Treatment fidelity was maintained by (a) manualization of treatment components, (b) thrice weekly treatment team meetings to discuss the content of session, review patient progress, and refine approaches to clinical challenges, (c) weekly seminar series to review treatment principles and related literature.</p>
Mo'tamedi et al. (2012)	<p>Experienced graduate hospital staff certified psychologist. Certified psychiatrist with credentials to administer the intervention. Hospital staff possessed the training and experience for delivering the therapy.</p> <p>Fidelity to the treatment manual and treatment adherence was checked using weekly supervision of each session. Sessions were audio recorded and one author evaluated the contents using a detailed checklist designed using the content of the manual.</p>
Najvani et al. (2015)	<p>Clinical psychologist.</p> <p>Not disclosed. Protocol available.</p>
Pedersen et al. (2019)	<p>Brief ACT workshop was carried out by 2–3 therapists trained in ACT and management of body distress syndrome (BDS). Extended ACT was led by a psychiatrist and a psychologist trained in ACT and management of BDS. Both had several years of experience with the patient group and psychotherapy, and participated in manual preparation.</p> <p>No systematic quality assessment.</p>
Rose et al. (2023)	<p>Clinical psychologist (ACT therapist who had attended 3 days of training prior to recruitment).</p> <p>Therapist attended monthly supervision meetings with a clinical supervisor to ensure adherence to the trial protocol. ACT-FM and ACTMuS-specific rating scale used to assess therapist's competence and fidelity to intervention. Telephone sessions audio-recorded and following completion of the study, two experienced ACT clinicians independently rated therapy sessions. Coders were trained over three meetings, which involved listening to and rating several treatment sessions together.</p>
Sianturi et al. (2018)	<p>Specialist nurses.</p> <p>Not disclosed.</p>
Trindade et al. (2020)	<p>Chartered psychologist (lead therapist) and observant therapist with training and experience in acceptance, mindfulness, and compassion-based interventions.</p> <p>Not disclosed.</p>
Vakilian et al. (2019)	<p>M.Sc. student in midwifery counseling supervised by expert in clinical psychology as the advisor professor.</p> <p>Not disclosed. Protocol available.</p>

Authors (year)	Therapists Treatment Integrity Procedures
Wetherell et al. (2011)	<p>A therapist with doctorate and another who received doctorate during study, trained and supervised by ACT experts. One additional licensed psychologist led one ACT group.</p> <p>To avoid confounding treatment with nonspecific therapist skills, both conducted both interventions. Weekly 1-hour supervisions with review of audiotapes. Experts in ACT and CBT rated a sample of 17 ACT and 16 CBT tapes for competence and fidelity for specific elements (e.g., conducting mindfulness exercise, use of Socratic style) and for overall session. Mean adherence scores ranged from 3.0 to 4.0 on a 0–4 Likert scale for ACT therapists and from 3.5 to 3.8 for CBT. Competence from 3.3 to 4.0 for ACT and 3.8 to 4.0 for CBT. Protocols, workbooks, and manuals were available.</p>
Witlox et al. (2021)	<p>Mental health counselors who received a 6-hours long in-person training for either ACT or CBT.</p> <p>Both completed treatment integrity checklist for 71.1% and 82% of the sessions, respectively. ACT adherence to prescribed elements for 80% of the sessions, and for 85.8% in CBT. Protocol available.</p>

*Note.* ACT = acceptance and commitment therapy; CBT = cognitive behavioral therapy; ACT-FM = ACT Fidelity Measure; ACTMuS = acceptance and commitment therapy for muscle disease; iACT = internet-delivered ACT; PACT = physical therapy informed by ACT.

Among the 22 articles in which therapists were indicated, nine reported interventions done exclusively by psychologists (Abid Azam et al., 2017; Cattivelli et al., 2021; Cosio and Schafer, 2015; Davoudi et al., 2020; Hoffmann et al., 2021; Najvani et al., 2015; Rose et al., 2023; Trindade et al., 2020; Wetherell et al., 2011), while five narrated psychologists working with other professionals, like: (a) physicians, physiotherapists, and occupational therapists (Bendelin et al., 2021); (b) a psychiatrist (Kuwabara et al., 2020); (c) physiotherapists, occupational therapists, a nurse, and physicians (McCracken et al., 2005); (d) psychiatrist and hospital staff (Mo'tamedi et al., 2012); and (e) psychiatrists (Pedersen et al., 2019).

In three studies, mental health counselors acted as therapists, either alone (Mak et al., 2020; Witlox et al., 2021) or teamed with a family practice resident (Arrol et al., 2022). A further five articles reported interventions conducted by nurses (Fernández et al., 2012; Sianturi et al., 2018), physical therapists (Godfrey et al., 2020), nurses and physiotherapists

(Haugmark et al., 2021), and a midwifery counselor (Vakilian et al., 2019).

Out of the 13 studies that went beyond just a protocol, manual, or any sort of template to guide interventions, the most comprehensive and formal treatment integrity procedures were adopted by: Cattivelli et al. (2021) – recording, coding, independent raters, and minimum interrater agreement; Fernández et al. (2012) – recording, independent raters, coding, minimum interrater agreement; Godfrey et al. (2020) – recording, coding, independent raters; Hoffmann et al. (2021) – recording, coding, supervision, independent rater; Mak et al. (2020) – recording, independent raters, ACT core competency rating form, screening for discrepancies; Mo'tamedi et al. (2012) – supervision, recording, checklist; Rose et al. (2023) – supervision, ACT-FM and ACTMuS scales, recording, independent raters; and Wetherell et al. (2011) – therapist rotation, supervision, recording, independent raters, coding.

Less rigorous approaches to treatment fidelity and integrity were observed in: Cosio and Schafer (2015) – supervision, training; Davoudi et al. (2020) – recording, comparison to protocol; Kuwabara et al. (2020) – independent rater, comparison to protocol; McCracken et al. (2005) – supervision, content analysis, seminar; and Witlox et al. (2021) – checklist, comparison to protocol.

### **Variables Employed**

Altogether, the studies reported using 111 namely different dependent variables, although some of them could probably be bundled together. For instance, *distress and dysfunctions* (Cattivelli et al., 2021), *emotional distress* (Wetherell et al., 2011), *global distress* (Cosio and Schafer, 2015), *emotional suffering* (Mo'tamedi et al., 2012), *psychological suffering* (Sahebari et al., 2019), and *psychological distress* (Haugmark et al., 2021) seem to pertain to a major dimension that could be labeled as psychological distress.



More important, though, is that to make the descriptive labels meaningful, one must investigate the instruments used to measure those variables and figure their operational definitions. In total, 81 different standardized measurement instruments were used in the studies reviewed (the complete list appears in the note to Table 1). Additionally, 14 physiological measures (e.g., BMI standardized calculation, Cattivelli et al., 2021), medical records, and non-standardized questionnaires (e.g., exercise beliefs and habits questionnaire, Haugmark et al., 2021; ACT core competency rating form, Mak et al., 2020) were also used.

The most frequently used variable was *depression*, which appeared in 13 studies and was measured with the following instruments: (a) Hospital Anxiety and Depression Scale–HADS (Abid Azam et al., 2017; Kuwabara et al., 2020; Rose et al., 2023), which was used most; (b) Hamilton Anxiety Rating Scale–HARS, Patient Health Questionnaire–8–PHQ-8, EuroQol-100, and EQ-5D-5L (Arrol et al., 2022); (c) Beck Depression Inventory–BDI (Davoudi et al., 2020; McCracken et al., 2005), and BDI-II (Najvani et al., 2015; Wetherell et al., 2011); (c) Patient Health Questionnaire–9–PHQ-9 (Godfrey et al., 2020; Witlox et al., 2021); (d) Symptom Checklist–92–SCL-92 (Hoffmann et al., 2021; Pedersen et al., 2019); and (e) Depression Anxiety Stress Scales–DASS-21 (Trindade et al., 2020).

A similar picture can be observed with the variable *anxiety*, which was assessed through different tools in 11 studies: (a) HADS (Abid Azam et al., 2017; Kuwabara et al., 2020; Rose et al., 2023; Sianturi et al., 2018), which appeared more times; (b) State Trait Anxiety Inventory–STAI (Fernández et al., 2012); (c) Generalized Anxiety Disorder–7–GAD-7 (Godfrey et al., 2020; Witlox et al., 2021); (d) Pain Anxiety Symptoms Scale–PASS (McCracken et al., 2005; Wetherell et al., 2011); (e) SCL-92 (Pedersen et al., 2019); (f) DASS-21 (Trindade et al., 2020); and (g) Pregnancy-Related Anxiety Questionnaire–

PRAQ (Vakilian et al., 2019).

A third relatively frequent variable was *quality of life*, thusly measured in 12 studies: (a) Minnesota Living with Heart Failure Questionnaire–MLHFQ (Ahmadi Ghahnaviyeh et al., 2020); (b) EQ-5D-5L (Arrol et al., 2022; Godfrey et al., 2020; Haugmark et al., 2021); (c) single question on the emotional quality of life–Emoqol-100 (Arrol et al., 2022); (d) MOS Short Form-12v2–SF-12 (Godfrey et al., 2020; Wetherell et al., 2011); (e) World Health Organization Well-being Index–WHO-5 (Hoffmann et al., 2021); (f) World Health Organization Quality of Life Questionnaire–WHOQOL (Jabbarifard et al., 2019), and WHOQOL-Bref (Kolahdouzan et al., 2020; Trindade et al., 2020); (g) Rand Short Form Health Survey-36–SF-36 (Javadi et al., 2019; Vakilian et al., 2019); and (h) Individualized Neuromuscular Quality of Life Questionnaire–INQoL (Rose et al., 2023). Here, one may notice a mixture of general quality of life measures, like the WHOQOL, and more specific instruments, like the INQoL.

Interestingly, Sahebari et al. (2019) used the term *psychasthenia* frequently in their article, as one of the core outcome variables. This is problematic because this term used to designate anxiety-related conditions in general but fell into obsolescence (American Psychological Association [APA], 2015). It was not explicitly defined in the text but is presumably a synonym for fatigue. This is also problematic since anxiety and fatigue are markedly distinct concepts (APA, 2015). Besides, the instrument they employed to measure psychasthenia (Fatigue Severity Scale–FSS; Krupp et al., 1989) was never intended to capture this construct. Another definitional problem in the Sahebari et al. study is the use of the term *disappointment* for a second key outcome variable, which was measured by the Beck Hopelessness Inventory–BHS (Beck et al., 1974). That was clearly a poor choice because disappointment is not hopelessness (APA, 2015).

Most variables ( $n = 92$ ) appeared only once in any of the studies; 10 were present in

two studies (acceptance, disability, experiential avoidance, mindfulness, pain self-efficacy, physical activity, sleep quality, somatic symptoms, stress, and treatment integrity); three in 3 studies (pain, pain acceptance, pain interference); one in 4 studies (pain severity); and two in 5 studies (psychological flexibility, treatment satisfaction). One or more variables pertaining to specific ACT processes were measured in 12 studies.

### **Study Designs**

Methodologically, there were two basic research designs among the reviewed studies: quasi-experimental trials ( $n = 14$ ) and randomized controlled trials–RCTs ( $n = 15$ ). Four quasi-experimental studies had no control group, but when controls were present, they were no treatment ( $n = 5$ ), TAU ( $n = 4$ ), and writing exercises ( $n = 1$ ). Regarding the RCTs, the control groups were no treatment ( $n = 3$ ), CBT ( $n = 3$ ), TAU ( $n = 4$ ), MMRP ( $n = 1$ ), psychoeducation ( $n = 1$ ), internet discussion forum ( $n = 1$ ), and self-help materials ( $n = 1$ ). Pedersen et al. (2019) conducted a three-armed RCT in which the controls were Brief ACT and enhanced care (EC), a manualized 1–1,5-hour follow-up medical-educational consultation 1–2 weeks after randomization.

In terms of the time points at which measurements were made, eight (27.6%) collected information only before and immediately after the interventions (pre, post), while 20 (69%) included at least one follow-up measure. Follow-up periods varied, with the majority (14) falling within the 3 to 12 months bracket. Other studies adopted shorter (1-week, Arrol et al., 2022; 1-month, Najvani et al., 2015, and Vakilian et al., 2019; 2-months, Kolahdouzan et al., 2020) or longer (20-months, Pedersen et al., 2019) follow-ups. Apart from these, Rose et al. (2023) conceptualized their measurement points at three, six, and nine weeks after the moment when their experimental groups were randomized.

### **Reported Study Results**

The articles included in this systematic review reported mostly a mixture of

positive and neutral results associated with the use of ACT in hospitals and primary care. Conversely, as will be shown, a few negative incidents were also detected. Crucially, 10 studies did not report statistical effects in a straightforward manner (Ahmadi Ghahnaviyeh et al., 2020; Davoudi et al., 2020; Fernández et al., 2012; Haugmark et al., 2021; Jabbarifard et al., 2019; Javadi et al., 2019; Mak et al., 2020; Sadri Damirchi et al., 2019; Sianturi et al., 2018; Vakilian et al., 2019). Table A1 in the Appendix summarizes the reported statistical effects.

### ***Randomized Controlled Trials***

Among the five RCTs in which active treatments were administered to control groups, four were conducted in hospital environments. In Sweden, Bendelin et al. (2021) described statistically significant effects in pain- and ACT-related variables for the intervention group, mainly at post-aftercare, e.g., pain acceptance ( $d = 0.63$ ), pain willingness ( $d = 0.61$ ), pain-specific self-efficacy ( $d = 0.82$ ), and pain inflexibility ( $d = 0.96$ ). The intervention was the same as that provided to the control group (MMRP) plus iACT, in two different phases.

A second of these studies (Pedersen et al., 2019) conducted a three-armed RCT to treat bodily distress syndrome in Denmark. It reported a significant improvement in the main outcome variable (global health) for the Extended ACT group in comparison to the EC control group ( $OR = 2.9$ ,  $CI\ 95\%: 1.4, 6.2$ ,  $p = 0.006$ ), which was considered the main intervention, but this was not verified between Brief ACT (defined as a second control group) and EC, nor in relation to 17 out of 18 secondary outcomes.

The other three RCTs used CBT as an active control. A study in Italy with obese participants led by Cattivelli et al. (2021) found no significant differences between interventions at post-treatment, except for the total and the subjective wellbeing scales of the CORE-OM instrument, in which CBT performed better than ACT. Patients in the ACT

group were more likely to lose at least 5% of their weight ( $OR = 2.32$ ,  $CI\ 95\%: 1.19, 4.61$ ) in follow-up and to maintain weight loss ( $OR = 2.11$ ,  $CI\ 95\%: 1.08, 4.19$ ).

Investigating chronic pain treatment for patients seeking help in primary care clinics in the USA, Wetherell et al. (2011) found no significant differences between the ACT and CBT conditions in the main outcome measures of their study. There was equivalent improvement in both ACT ( $\beta = -0.06$ ;  $SE = 0.02$ ;  $p = 0.02$ ) and CBT ( $\beta = -0.09$ ;  $SE = 0.02$ ;  $p < 0.001$ ). On the other hand, participants in the CBT group found treatment more credible, while ACT participants were more satisfied with their pain treatment.

Lastly, the RCT by Witlox et al. (2021) studied older adults (55–75 years old) in the Netherlands with respect to anxiety symptoms. Their modality of ACT used a mix of face-to-face sessions and online lessons, which were compared to face-to-face CBT. The results uncovered no significant difference in anxiety severity between treatments at any measurement point, indicating that ACT and CBT were equally effective. Both conditions had large post treatment effects ( $d \geq 0.96$ ), which were maintained at 12-months follow-up. Apart from that, the effects on positive mental health ( $d = 0.29$ ) and treatment satisfaction ( $d = 0.78$ ) were significantly stronger in the ACT group.

Amid the RCTs that applied TAU to the control group, two were conducted in hospitals and two within PHC. In their study involving adults with chronic back pain in a British hospital context, Godfrey et al. (2020) used a blend of ACT and physical therapy as the main intervention, delivered in a brief format, which yielded better results at 3-months follow-up than the usual treatment in functional capacity in relation to control ( $d = 0.2$ ), but that were not maintained in the 12-months follow-up.

Also in the UK, Rose et al. (2023) conducted a multicenter RCT combining ACT and usual medical treatment to adults diagnosed with muscle diseases seeking assistance in hospitals. In this case, ACT was provided in a rather original mode, encompassing written

and audio files supplied by email, in 45 to 90-minutes modules, supplemented by five 15 to 30-minutes sessions conducted by telephone. Their results showed consistent improvement in comparison with the control group (medical TAU only) during the intervention, that is, at 3 ( $SMD = -0.45$ ), 6 weeks ( $SMD = -0.54$ ), and 9 weeks ( $SMD = -0.71$ ) after randomization.

In a Norwegian primary care context, Haugmark et al. (2021) implemented Vitality Training Programme (VTP) together with physical activity to treat fibromyalgia in adults. VTP is a blended approach that encompasses elements of ACT amalgamated with mindfulness-based techniques. Against TAU, this 10-sessions program was not more effective in improving pain-related outcomes.

Conversely, Vakilian et al. (2019) performed a RCT in Iran to address pregnancy-related fear and anxiety in PHC. They reported modest results related to their more traditional eight 90-minutes sessions group protocol. When compared to TAU, anxiety decreased post intervention ( $p = 0.001$ ) and increased at follow-up, albeit remaining significantly lower than baseline. Quality of life also improved after intervention ( $p = 0.026$ ) but worsened at follow-up.

Three RCTs employed control conditions that could be loosely termed as placebo interventions, in the sense that they were likely chosen as active treatments that lack the presumed effectiveness of the ACT condition or even other active controls (for a more in-depth discussion about placebos in psychotherapy, see Enck and Zipfel, 2019). One of these is Davoudi et al. (2020), who treated depression and sleep quality in a sample of patients with painful diabetic neuropathy from an Iranian hospital environment. For that, psychoeducation was used as a control. Their results showed significantly better outcomes in depression and sleep quality for the ACT intervention post intervention and at follow-up ( $F = 6.81, p < 0.05$ ), when compared to control.

Hoffmann et al. (2021) targeted adults with severe health anxiety (also known as hypochondriasis) in a Danish hospital setting for treatment using internet-delivered ACT (iACT). The control group received the same dose of another web-provided intervention, in the form of a discussion forum (iFORUM), where participants discussed topics related to health anxiety without therapist interference. They found that between-group differences in health anxiety symptoms reduced significantly ( $d = 0.80$ ) at follow-up relative to baseline. At the same time point, compared to control, 35% of patients in the iACT condition were no longer clinically diagnosed (versus 16% in iFORUM).

The third study to use a placebo-like control was Mak et al. (2020), aimed at adults with nicotine dependence. In this case, standard self-help materials were given to both intervention and control groups, but ACT was added to the intervention group. Their results showed no significant between-group difference in quit rate at the 12-months follow-up, but the participants' readiness to quit and psychological flexibility did improve in ACT group. The 7-day point-prevalence abstinence rates at the 12-months follow-up was 24.3% in the intervention group and 21.6% in the control group. ACT participants also perceived that it was more important to quit (mean ratings = 82.54,  $SD = 19.55$ ) than the control group (mean ratings = 74.93,  $SD = 20.26$ ), with  $p = 0.024$ .

A final set of studies used no treatment in their RCTs' control groups, including Ahmadi Ghahnaviyeh et al. (2020), whose research focused on quality of life of hospital patients with myocardial infarction in Iran. As a result of the application of an ACT-only individual protocol, they conducted a repeated measures ANOVA and found that the intervention group exhibited significantly higher mental and physical health, as well as overall quality of life at both post treatment and follow-up measurements. At the same time points, they reported a quality-of-life worsening in the control group ( $p < 0.001$ ).

The New Zealand study by Arrol et al. (2022) that investigated the effect of a

remarkably brief (one 10-minutes session) ACT intervention (dubbed fACT) on depression, quality of life, and psychological flexibility, as measured by the PHQ-8 scale. No treatment was administered to the control group. Conducted in PHC context, the results indicated a significant difference ( $p < 0.039$ , one sided;  $p < 0.078$ , two sided) in favor of the experimental group in the depression measure after one week of the intervention, which was the only post treatment measurement point. The number needed to treat (NNT) amounted to 4.0, which is comparable to results in behavioral activation studies and more effective than medication. No other significant changes were detected.

Finally, Jabbarifard et al. (2019) provided an ACT intervention to Iranian hospitalized adults with thalassemia major and stress symptoms, without any treatment to the control group. They found significant improvement ( $p < 0.001$ ) in perceived stress ( $d = 0.66$ ), resilience ( $d = 0.75$ ), and quality of life ( $d = 0.81$ ) both within- and between-group post treatment and at follow-up.

### ***Quasi-Experimental Designs***

Among the 14 studies that reported the use of quasi-experimental designs, that is, without randomization procedures in sample selection, 10 resorted to control groups as comparisons to the main intervention. Out of these, four had TAU as active controls and one used a form of placebo.

Fernández et al. (2012), within a Spanish hospital setting, employed a very brief (one 30-minutes session) acceptance-based nursing intervention (ANI) to prepare patients about to undergo laparoscopic cholecystectomy, together with TAU. The control group received only TAU. The results revealed that participants in the ANI group left the hospital earlier after the medical procedure than those from the control group. They also showed lower post-surgical anxiety and demanded less analgesics. On the other hand, Wilcoxon Rank tests were not significant in pain intensity and frequency of pain in both conditions



( $p_s > 0.16$ ) and according to Mann-Whitney U tests intensity and frequency of pain after discharge did not differ significantly between intervention ( $p = 0.88$ ) and control ( $p = 0.12$ ) conditions.

Mo'tamedi et al. (2012) targeted their intervention at adult females with chronic headache, out of an Iranian hospital context. The control group received medical TAU, while the experimental group was at the same time submitted to an ACT protocol. They reported that pain perception did not recede significantly, but there was significant reduction in functional disability ( $d = 0.93$ ), affective distress ( $d = 2.54$ ), pain intensity ( $d = 1.35$ ), and the sensory dimension of pain intensity ( $d = 0.28$ ).

A similar experimental framework was employed by Sahebari et al. (2019), using medical TAU as a control and added to ACT as the main intervention. They addressed psychological suffering in women treating systemic lupus erythematosus in an Iranian hospital, targeting the variables disappointment, psychological distress, and psychasthenia (the problematic use of these terms has been pointed in the Variables Analyzed session of the present dissertation). The results showed that the ACT group presented significative reduction in all three outcomes ( $\eta = 0.85$ ,  $\eta = 0.80$ ,  $\eta = 0.79$ , respectively,  $p < 0.0001$ ) in relation to the control group.

A fourth quasi-experimental study (Trindade et al., 2020) that resorted to TAU as a control condition was conducted with women aged 35 to 70 years presenting nonmetastatic breast cancer in a hospital from Portugal. On top of also receiving TAU, the intervention provided to the experimental group was a blend of ACT with two other therapeutic models: MBSR and CFT. Given this, a large effect size ( $g = 0.79$ ) was reported in the intervention group for the psychological health dimension of the Abbreviated World Health Organization Quality of Life Questionnaire (WHOQOL-Bref), as well as lesser effects for physical health ( $g = 0.16$ ) and quality of social relationships ( $g = 0.42$ ). Another

instrument (DASS-21) yielded moderate effects for depression ( $g = 0.42$ ) and stress ( $g = 0.32$ ). Participants in the main intervention also reported an improvement in difficulty-dealing abilities.

A different approach to the control condition was adopted by Kolahdouzan et al. (2020), who used a placebo-like active intervention (namely, writing exercises) in their study directed to anxiety-experiencing hospital adult cancer patients in Iran. Following their results, they concluded that the ACT-intervention group performed better than control with significantly decreased fear of death ( $\eta^2_p = 0.012$ ,  $p = 0.242$ ) and death avoidance ( $\eta^2_p = 0.004$ ,  $p = 0.314$ ) along with increased mental health dimension ( $\eta^2_p = 0.003$ ,  $p = 0.329$ ).

The study by Javadi et al. (2019) is peculiar in the sense that it had a no treatment control condition sided with two experimental groups: ACT and MBSR. The participants were adult hospital patients with migraine diagnosis in Iran. They reported significantly smaller severity of pain and health-related quality of life in both intervention groups posttreatment and at follow-up, as compared to control ( $F_{(0.05)} = 3.22$ ), but no significant difference between the two active interventions.

There were four more quasi-experimental studies in which the control groups were submitted to no treatment. Abid Azam et al. (2017), out of a Canadian hospital context, conducted an ACT intervention with patients at risk for chronic postsurgical pain and pain-related opioid use, for which both groups showed significant reductions in pain intensity (17% and 8% score reduction, for ACT and control, respectively), pain interference, anxiety, and opioid use. Significantly larger reductions for pain interference ( $F_{(1, 203)} = 32.98$ ,  $p < 0.001$ ,  $\eta^2_p = 0.14$ ), opioid use ( $F_{(1, 274)} = 74.67$ ,  $p < 0.001$ ,  $\eta^2_p = 0.21$ ), and depression ( $F_{(1, 200)} = 12.65$ ,  $p < 0.001$ ,  $\eta^2_p = 0.06$ ) were observed in the ACT group.

Still in Iranian hospital settings, Njvani et al. (2015), Sadri Damirchi et al. (2019), and Sheibani et al. (2019) used 8-sessions ACT protocols in their experimental groups, all

compared to no treatment conditions. Najvani et al. focused on adult women with breast cancer and the ACT group performed better than the control group, with significantly lower depression ( $\eta^2 = 0.76, p = 0.001$ ) and increased flexibility ( $\eta^2 = 0.78, p = 0.001$ ) posttreatment and at follow-up. In turn, Sadri Damirchi et al., treating adult women with body dysmorphic disorder (BDD) linked to bodily consequences from breast cancer treatment, affirmed that the intervention group had significant reduction in physical dissatisfaction and fear of evaluation posttreatment in comparison to control, but their reporting was not very clear. Lastly, the Sheibani et al. study aimed at adults with coronary disease reported significant effects on increased positive ( $F = 10.25, p < 0.05, \eta^2 = 0.29$ ) and decreased negative ( $F = 4.47, p < 0.05, \eta^2 = 0.15$ ) emotional regulation strategies for the experimental group, with no difference in self-control.

The last four quasi-experimental studies in this review had no control groups. The only one dealing with a PHC setting was from the USA. Cosio and Schafer (2015) investigated several pain-related variables in treating military veterans suffering from idiopathic chronic pain. They reported significant betterment in pain interference ( $d = 0.26$ ), illness-focused coping ( $d = 0.38$ ), and global distress ( $d = 0.42$ ), but no change in pain intensity, functional disability, wellness-focused coping, and catastrophizing.

The other three studies without control groups were conducted in hospitals. Kuwabara et al. (2020) used a mix of ACT and vestibular rehabilitation to tackle nonvertiginous dizziness among adult patients in Japan. According to their results, there was a large effect for dizziness severity ( $d = 1.11$ ) at 6-months follow-up, 92.6% of the participants completed the 6-sessions intervention, 40.7% achieved remission, and 59.3% responded to treatment.

On the other hand, McCracken et al. (2005) conjugated ACT, physiotherapy, and medical TAU to treat adults with pain-related distress and disability in the UK. They

assessed eleven outcome and two process variables and reported significant reductions at posttreatment in depression (41.2%), physical (25.0%) and psychosocial (39.3%) disability, hours of rest during the day related to pain (61.8%) and increased (48.2%) sit-to-stand performance, most of which were maintained at 3-months follow-up. Analgesic use and general practitioner visits also declined significantly. Most improvements were correlated with pain acceptance. Finally, Sianturi et al. (2018) dealt with patients who suffered a cerebrovascular accident in Indonesia by administering ACT together with relaxation. That way, anxiety was significantly reduced from moderate to mild at posttreatment (14.94 points on average).

### *Adverse Events*

Possible negative effects from the studies were seldom mentioned. This shouldn't come as a surprise, because negative incidents seem to be infrequently documented in the literature, although they appear to be common in psychotherapy (Rozenal et al., 2017). In our sample, they were explicitly addressed in only six of the articles reviewed. Notably, among the ones who delved into this issue, Hoffmann et al. (2021) adopted a comprehensive and systematic approach to deal with adverse events, but that was an exception.

In Hoffmann et al. (2021), all events of symptom deterioration, requiring acute hospitalization, and negative effects in general, were summarized and then measured at post-treatment using the Negative Effects Questionnaire (NEQ; Rozenal et al., 2016). Additionally, each one was attributed to either the treatment received or to other causes and rated according to the impact they had. They found that no patient in the iACT condition reported symptom deterioration at 6-months follow-up, only in the control condition, no one experienced a serious problem requiring acute hospitalization. Nevertheless, Hoffmann et al. also informed that 78.8% from the intervention group and

46.3% from the control reported at least one adverse effect attributed to the treatment, like more anxiety, even though they were not significantly associated with treatment completion in either condition.

In turn, Haugmark et al. (2021) disclosed that 34 patients reported adverse events, of whom 21 (28%) in the intervention group and 13 (17%) in the control group. Main complaints were increased pain and fatigue, which were perceived as being caused by medication (nine in intervention group, four in control), physical activity (12 intervention, nine control), the intervention (four intervention), and the alternative treatment (one intervention, one control).

Similarly, Rose et al. (2023) disclosed that in their intention to treat (ITT) sample, 30 (52.6%) participants from the intervention group and 27 (47.4%) from the control group reported at least one adverse event at follow-up, four of which were considered serious: one death in the control group plus a non-fatal overdose, an incident of suicidal ideation, and an episode of breathlessness requiring hospitalization in the intervention group. An ethics committee examined the cases and considered them unrelated to the study.

Also, Godfrey et al. (2020) mentioned that 21 participants reported adverse events, nine from intervention and 12 from control group, but an independent committee concluded that they were not related to treatment. Noteworthy, Bendelin et al. (2021) reported a high attrition rate in their study, since most participants in the intervention group (57%,  $n = 28$ ) had dropped out in post aftercare but did not investigate a possible relation with adverse episodes. Finally, Witlox et al. (2021) stated that no adverse events were reported in their trial.

### **Quality Assessment**

The studies included in this review were classified in accordance with the template proposed by Sackett (1989). The tool was originally developed to guide assessment and

dissemination of research evidence from medical studies, but was further adapted for use in different fields, including in psychology (Mindell et al., 2006; Paulos-Guarnieri et al., 2022). The articles were categorized into five distinct levels of evidence (I, II, III, IV, and V) and three recommendation grades (A, B, C), according to the study design employed. It should be stressed that studies with evidence levels III, IV, and V fall on the grade C of recommendation. Table 4 displays the definition of each category and the reviewed studies classified in each of them.

**Table 4**

*Grades of Recommendation and Levels of Evidence by Study Design in Reviewed Studies*

Grade	Level	Study design	Reviewed studies
A	I	Large, well-designed, randomized, and blinded controlled study with statistically significant conclusions on relevant variables	Cattivelli et al. (2021); Godfrey et al. (2020); Haugmark et al. (2021); Hoffmann et al. (2021); Mak et al. (2020); Pedersen et al. (2019); Rose et al. (2023); Wetherell et al. (2011); Witlox et al. (2021)
B	II	Smaller, well-designed, randomized and blinded, controlled study with statistically significant conclusions on relevant	Ahmadi Ghahnaviyeh et al. (2020); Arrol et al. (2022); Bendelin et al. (2021) <sup>a</sup> ; Davoudi et al. (2020); Jabbarifard et al. (2019); Vakilian et al. (2019)
C	III	Well-designed, non-randomized prospective study with control group	
	IV	Well-designed, large prospective study with historical controls or careful attention to confounding effects or small prospective study with control group	Abid Azam et al. (2017); Fernández et al. (2012); Javadi et al. (2019); Kolahdouzan et al. (2020); Mo'tamedi et al. (2012); Najvani et al. (2015); Sadri Damirchi et al. (2019); Sahebari et al. (2019); Sheibani et al. (2019); Trindade et al. (2020)
	V	Small prospective study or case series without control groups	Cosio and Schafer (2015); Kuwabara et al. (2020); McCracken et al. (2005); Sianturi et al. (2018)

*Note.* Grade A = supported by at least one, preferably more, Level I randomized trial; Grade B = by at least one Level II randomized trial; Grade C = by Level III, IV, or V evidence. Large = sample sizes bigger than 60 and/or enough to grant minimum 0.80 statistical power. <sup>a</sup> Not considered large due to an attrition rate of more than 50%. Adapted from Sackett (1989) and Mindell et al. (2006).

From all the studies selected for the review, 31.0% ( $n = 9$ ) were classified as having evidence level I (Grade A) and 20.7% ( $n = 6$ ) amounted to level II (Grade B), which conveys a higher level of confidence in the results they reported. On the contrary, 34.5%

( $n = 10$ ) fell into the level IV category and 13.8% ( $n = 4$ ) in the lesser level V, both belonging to the Grade C of recommendation. All else constant, this categorization serves as a general measure of trial quality and the degree to which their corresponding interventions are worth endorsing for further application (Sackett, 1989).

### **Discussion**

This is the first systematic review of clinical trials with a focus on the use of acceptance and commitment therapy in hospital and PHC contexts. To determine if ACT is being used as a psychological intervention in these contexts and if it has been effective, the main objective of the study was to systematically search and analyze the literature to unearth and qualify the available evidence on the subject.

An exploration of electronic databases clinical trials published from January 1, 2000, to May 1, 2022, revealed 357 records. Following the elimination of duplicates and exclusions, 29 studies were retained for the review, which followed the PRISMA guidelines (Page, 2021a).

A total of 27 (93.1%) of the reviewed studies reported positive outcomes in at least one variable measured. From the other two articles, Godfrey et al. (2020) found a minor improvement in functional capacity ( $d = 0.20$ ) at 3-months follow-up, which was not maintained at the 12-months follow-up. Haugmark et al. (2021), on the other hand, concluded that their mindfulness- and acceptance-based intervention was not more effective in improving pain-related outcomes than treatment as usual. It should be noted that Mak et al. (2020) found no significant between-group difference in their main outcome variable (quit rate at the 12-months follow-up), but participants' readiness to quit and psychological flexibility improved in the ACT group.

Notably, no negative outcomes were reported. Altogether, the results clearly point to ACT's efficacy in a variety of situations, but a little caution is always warranted, in the

least because for some time it has been known that there exists a substantial risk of publication bias. In their much-cited article, Easterbrook et al. (1991) showed that studies reporting statistically significant results were more prone to publication compared to those with no discernible difference between study groups, and studies with significant findings were associated with a higher number of publications and presentations, as well as publication in journals with a substantial citation impact factor. Thus, they stressed the need for cautious interpretation of conclusions based solely on a review of published data.

Beyond that, all the results found in this review should be put in perspective and balanced against specific characteristics of each study, like their methodological quality, possible biases, sample size, intervention format, integrity, and dose (frequency x duration), besides factoring in a noticeable degree of heterogeneity.

### **Intervention Results and Effects**

The outcomes gleaned from the reviewed articles indicate that the interventions sought to influence dozens of variables, in different countries, across varied hospital and primary care contexts. Positive results were yielded not only in alleviating ordinary psychological issues like anxiety, depressive symptoms, pain tolerance, and affective distress but also in enhancing overall quality of life and measures of psychological flexibility in general. These were consistent with ACT's transdiagnostic perspective aimed at holistic improvements beyond symptom reduction (Dindo et al., 2017).

Other nominally valuable increments were obtained in physical health-related therapeutic goals, like sleep, disability, dizziness, and body weight. These also align with the transdiagnostic approach of ACT and resonate with findings from various meta-analyses across different health conditions (A-Tjak et al., 2014; Gloster et al., 2020).

ACT-based treatments evaluating various aspects of pain had mixed results. For one part, Fernández et al. (2012) reported no significant difference between intervention



and control conditions, but the experimental group left hospital earlier, demanded less analgesics and exhibited lower anxiety post discharge. On the other hand, Mo'tamedi et al. (2012) obtained significant reduction in pain intensity ( $d = 1.35$ ), and the sensory dimension of pain intensity ( $d = 0.28$ ), Abid Azam et al. (2017) registered significantly larger reductions for pain interference ( $\eta^2_p = 0.14$ ) and opioid use ( $\eta^2_p = 0.21$ ) in the ACT group, and Cosio and Schafer (2015) reported significant improvement in pain interference ( $d = 0.26$ ). McCracken et al. (2005) also reported significant reductions at posttreatment in hours of rest during the day related to pain (61.8% decrease from baseline) and declining analgesic use and general practitioner, mostly correlated with pain acceptance. These findings align with other studies investigating ACT for pain (Gloster et al., 2020; Ma et al., 2023).

Three studies that pitted ACT against CBT found that both were similarly effective, which coheres with previous meta-analytic investigations (A-Tjak et al., 2014; Gloster et al., 2020). Cattivelli et al. (2021) found no significant differences between these interventions at post-treatment, but while CBT performed better than ACT in subjective wellbeing, ACT participants were more likely to lose at least 5% of their weight ( $OR = 2.32$ ) and to maintain weight loss ( $OR = 2.11$ ) in follow-up. Wetherell et al. (2011) found no significant differences between the ACT and CBT in chronic pain for primary care patients, with an equivalent improvement in both. In their study, CBT participants found treatment more credible, but ACT participants were more satisfied.

Witlox et al. (2021) anxiety study revealed no significant difference in treatment effects between treatments, indicating that ACT and CBT were equally effective: both conditions had large post treatment effects ( $d \geq 0.96$ ), which were maintained at follow-up. Apart from that, the effects on positive mental health ( $d = 0.29$ ) and treatment satisfaction ( $d = 0.78$ ) were significantly stronger in the ACT group.

A few studies disclosed results supporting the notion that psychological flexibility and its related ACT processes might lie beneath psychological change, as this therapeutic model proposes (Barbosa & Murta, 2014; Hayes et al., 2011). For instance, in Najvani et al. (2015), women with breast cancer in the ACT group had significantly lower depression ( $\eta^2 = 0.76, p = 0.001$ ) and increased flexibility ( $\eta^2 = 0.78, p = 0.001$ ) posttreatment and at follow-up. Bendelin et al. (2021) described statistically significant effects for the intervention group in pain- and ACT-related variables: pain acceptance ( $d = 0.63$ ), pain willingness ( $d = 0.61$ ), pain-specific self-efficacy ( $d = 0.82$ ), and pain inflexibility ( $d = 0.96$ ). On their part, Kollahdouzan et al. (2020) recorded decreased death avoidance ( $\eta^2_p = 0.004, p = 0.314$ ) together with increased mental health dimension ( $\eta^2_p = 0.003, p = 0.329$ ). As mentioned, McCracken et al. (2005) clinical results mostly correlated with pain acceptance.

On the other hand, Mak et al. (2020) reported that psychological flexibility improved in the ACT group, but contrary to what was predicted, no significant between-group difference in smoking quit rate at the 12-months follow-up was achieved. Nor Arrol et al. (2022) detect any significant change in psychological flexibility in their study, which promoted significant improvement in depressive symptom severity in the fACT group ( $NNT = 4$ ). It should be noted that this pattern of mixed results related to outcomes of ACT intervention being possibly influenced by changes in psychological flexibility was also observable in prior research (A-Tjak et al., 2014; Twohig & Levin, 2017).

### **Research Quality**

As can be seen in Table 3, a little more than half (51.7%) of the studies included in this review achieved Level I or II ratings according to the Sackett (1993) criteria, which rendered them as highly worthy of recommendation in terms of further application of their interventions. It is noteworthy that, in accordance with the criteria, all of them were

randomized controlled trials, the main difference between Level I and Level II being the larger sample sizes in the higher rank.

Following the same benchmark, all quasi-experimental studies fell into Level IV and V regarding the evidence provided by their respective research designs, meaning that, although they may contain important information and externally valid conclusions, there is scarce ground to conclude that their results were due to the interventions performed (Sackett, 1989).

Within the 9 studies that achieved the highest grade of recommendation (A), Godfrey et al. (2020), in a hospital environment, Haugmark et al. (2021), and Mak et al. (2020), in PHC, reported no significant improvements in their outcome variables. The other six presented positive results, like Cattivelli et al. (2021), Wetherell et al. (2011), and Witlox et al. (2021), who, as previously mentioned, found that ACT and CBT were equally efficacious.

Two high quality studies from Scandinavia also reported positive outcomes: Hoffmann et al. (2021) registered that between-group differences in health anxiety symptoms reduced significantly ( $d = 0.80$ ) at follow-up relative to baseline, and that 35% of patients in the iACT condition were no longer clinically diagnosed versus 16% in control. In turn, Pedersen et al. (2019) concluded that an Extended ACT intervention was responsible for significant global health improvement in comparison to usual extended care ( $OR = 2.9$ , 95% CI: [1.4, 6.2],  $p = 0.006$ ), but this was not verified with a Brief ACT treatment. Finally, Rose et al. (2023) reported that ACT added to usual medical treatment achieved significant improvement for neuromuscular quality of life along the treatment ( $-0.45 \leq SMD \leq -0.71$ ).

Regarding the less commended studies (Grades B and C), besides the study design features implicit in the classification, it should also be mentioned that the majority of them

(69.0%;  $n = 14$ ) had no proper treatment integrity procedures, while among the Grade A studies these were the minority (22.2%;  $n = 2$ ). Additionally, all Grade A papers reported who performed the interventions, two (33.3%) failed to do so in the Grade B trials, and five (35.7%) in the Grade C studies. These characteristics further compound and confirm a general picture of the assessed quality of the studies.

Specifically, about who the therapists were, there didn't seem to be a correlation between this variable, efficacy of intervention, and methodological quality since intervention performance was not the exclusive turf of trained psychologists in various research conditions and in relation to different outcomes. Concerning this, previous research has already shown that therapists with limited ACT training were able to produce positive outcomes (Lappalainen et al., 2007).

### **Iranian Studies**

It stands out that 11 (37.9%) of the 29 studies reviewed were conducted in Iran (Table 2). That's more than, for example, the total produced in anglophone countries (Canada, New Zealand, United Kingdom, USA), which may come as a surprise since ACT was originated in the United States and most of its books, articles, and training resources have been produced in English.

One may speculate about the reason for this Iranian relative prevalence, and, in fact, this phenomenon has been found to be relevant in relation to ACT studies more generally. According to Akbari et al. (2022), who conducted a systematic review of 110 RCTs to assess the status of ACT research in Iran, there were studies applying this therapeutic approach to psychological conditions such as generalized anxiety disorder (GAD), posttraumatic stress disorder (PTSD), obsessive-compulsive disorder (OCD), social anxiety disorder, substance use disorder, mood disorders, eating and obesity, and other anxiety related conditions. Besides, several articles reported research evaluating the

outcomes of ACT interventions in medical conditions like cancer, diabetes, gastric wounds and dysfunctions, pain, migraine, infertility and pregnancy, HIV/AIDS, disability, and multiple sclerosis.

Akbari et al. (2022) included studies written in both English and Persian and pointed to a relevant potential impact of the Iranian academic production in the field of ACT. For instance, their review detected 14 RCTs about ACT for OCD, whereas aside from those only two trials have been so far published, both from the USA (Twohig et al., 2010, 2018), that is, an eight-fold increase in the knowledge base about this topic. Akbari et al. hypothesize that some Iranian cultural traits have contributed to ACT's dissemination in that country, such as (a) fatalism and faith in fate, which would tend to facilitate acceptance; (b) a cultural environment where the use of metaphors and proverbs is commonplace, which broadly matches ACT approach; and (c) Islamic religious belief in that one must accept everything in life as a divine gift, which may be congruent with some ACT principles.

In our sample, it is also noteworthy that four Iranian studies ranked in the Level II of evidence and the other seven in Level IV, according to the criteria set out by Sackett (1989), being generally characterized by small sample sizes, lack of active controls, no treatment integrity procedures reported, nor control for adverse events, among other methodological shortcomings, and only five reported statistical effects. In this sense, these studies fall into what seems to be a pattern among ACT research conducted in Iran (Akbari et al., 2022).

### **Review Limitations and Future Research**

This review has some clear limitations. Firstly, the sample of studies included is highly heterogenous in terms of methods employed, countries of origin, health contexts, target populations, clinical conditions, diversity of variables studied, and instruments used.

This severely restricts generalizability.

Secondly, there was only a small number of high-quality studies, since most of the papers reviewed had significant methodological shortcomings, such as non-active or non-existent control groups, small samples, deficient accounting of dropouts, inadequate reporting of effects, and non-random sampling criteria. Critically, these features impinge on the possibility to make causal inferences between therapeutic interventions and the obtained results.

Thirdly, no systematic risk of bias assessment was performed on the studies, which further hinders the reliability of the conclusions reached.

Finally, due to the high heterogeneity of the included articles and the restricted and the often-inconsistent reporting of statistical effects of the outcomes, a meta-analysis was not conducted. This decision was made on operational grounds as well as because aggregate results thus obtained could be seriously flawed.

Future review studies on primary care and hospitals settings are encouraged to address those limitations to provide a more comprehensive and reliable overview of the use of ACT in these healthcare contexts. It is important to notice that although even some of the more well-designed quasi-experimental studies lack internal validity, they can still provide useful and naturalistically (externally) valid conclusions. In this sense, they should not be dismissed by health care practitioner with an interest in learning more about the potential application of ACT interventions in hospitals and primary care settings. Nonetheless, when it comes to providing general clinical guidance or formulating public health policies, more studies are recommended.

### **Conclusions**

The results compiled in this systematic review show that ACT has been used as a psychological intervention in hospitals and PHC environments. They also clearly suggest

the potential efficacy of ACT as a psychological intervention tool in those settings, treating various relevant clinical conditions involving pain, depression, stress, and anxiety, among others. Furthermore, the results confirm the transdiagnostic and flexible nature of this therapeutic approach, including in terms of combination with other tools and not being bound to trained psychologists for apt implementation.

These characteristics of ACT interventions are crucially important in health care settings, where health psychology is demanded to aid various publics, like patients, caregivers, other health professionals, and so forth. Particularly, this involves multidisciplinary teamwork to deliver psychological assessments and diagnoses, preventive measures, brief interventions, and even psychotherapy itself (Baker & McFall, 2014; Robinson & Reiter, 2016).

More specifically, based on the higher quality studies in this review, ACT can be recommended with a fair degree of confidence for adults: (a) as an adjunct in group intervention to the treatment of obesity in hospitals; (b) as an internet-delivered intervention (iACT) for severe health anxiety for hospitalized persons; (c) as a group treatment to bodily distress syndrome in hospitals; (d) as an adjunct individual email and telephone intervention for people hospitalized due to muscle diseases; (e) as a group therapy for people who seek help for chronic pain in PHC; and (f) as a stand-alone individualized mixed (face-to-face plus online) intervention in hospitals for older individuals (55-75 year old) with mild to moderately severe anxiety symptoms. However, it should be stressed that the studies on which these recommendations are based come from Europe and the USA and that more quality research is needed to establish the validity of their results in other socioeconomic and cultural environments.

A few limitations for this review have been noted, which put a methodological boundary when generalizing the reported results. Still, the amount of evidence of moderate

to high quality inhere contained provide justification for further incorporation of ACT to the health psychology toolkit. At the same time, there is clearly room for more research so that this model is confidently recommended as an intervention within the Brazilian health care system. The present preliminary findings serve as encouragement for more effectiveness and feasibility studies. Particularly, the lack of Brazilian studies stands out and presents itself as a pool of research opportunities.



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## Appendix

**Table A1**

*Summary of Statistical Effects Reported in the Studies Revised*

Authors (year)	Variable	Time point	Group	Effects
Abid Azam et al. (2017)	Pain intensity	Post-discharge	ACT	$F_{(1, 218)} = 23.10, p < 0.001, \eta^2_p = 0.10$ 17% mean pain score reduction
			Control	8% mean pain score reduction
	Pain interference	Post-discharge	ACT	$F_{(1, 203)} = 32.98, p < 0.001, \eta^2_p = 0.14$
			Control	$F_{(1, 203)} = 20.34, p < 0.001, \eta^2_p = 0.09$
	Anxiety	Post-discharge	Group	$F_{(1, 199)} = 5.52, p < 0.05, \eta^2_p = 0.03$
			Time	$F_{(1, 199)} = 5.13, p < 0.05, \eta^2_p = 0.03$
	Depression	Post-discharge	Time	$F_{(1, 200)} = 12.65, p < 0.001, \eta^2_p = 0.06$
			Group x Time	$F_{(1, 200)} = 4.07, p < 0.05, \eta^2_p = 0.02$
			ACT	$F_{(1, 200)} = 10.98, p = 0.001, \eta^2_p = 0.05$
	Opioid use	Post-discharge	Control	$F_{(1, 200)} = 2.03, p = 0.16, \eta^2_p = 0.01$
Group			$F_{(1, 274)} = 5.17, p < 0.05, \eta^2_p = 0.02$	

Authors (year)	Variable	Time point	Group	Effects
			Time	$F_{(1, 274)} = 74.67, p < 0.001, \eta^2_p = 0.21$
			Group × Time	$F_{(1, 274)} = 22.35, p < 0.001, \eta^2_p = 0.08$
			ACT	$F_{(1, 274)} = 63.89, p < 0.001, \eta^2_p = 0.19$
			Control	$F_{(1, 274)} = 12.74, p < 0.001, \eta^2_p = 0.04$
Arrol et al. (2022)	Depressive symptoms	Follow-up	ACT	Mean PHQ-8 score = 7.4, <i>NNT</i> = 4.0
			Control	Mean PHQ-8 score 10.1
			Difference	$p < 0.039$ , one sided $p < 0.078$ , two sided
Bendelin et al. (2021)	Pain acceptance	Post	Difference	$d = 0.50$ , CI 95%: 0.04, 0.96
		Post-aftercare		$d = 0.63$ , CI 95%: 0.04, 1.22
	Pain willingness	Post	Difference	$d = 0.60$ , CI 95%: 0.14, 1.06
		Post-aftercare		$d = 0.61$ , CI 95%: 0.02, 1.20
	Pain inflexibility	Post-aftercare	Difference	$d = 0.96$ , CI 95%: 0.37, 1.55
	Avoidance	Post-aftercare	Difference	$d = 0.89$ , CI 95%: 0.31, 1.47
	Fusion	Post-aftercare	Difference	$d = 0.98$ , CI 95%: 0.39, 1.57

Authors (year)	Variable	Time point	Group	Effects
	Affective distress	Post-aftercare	Difference	$d = 0.58$ , CI 95%: 0.13, 1.03
	Pain self-efficacy	Post-aftercare	Difference	$d = 0.82$ , CI 95%: 0.24, 1.40
		Follow-up		$d = 0.66$ , CI 95%: 0.02, 1.30
Cattivelli et al. (2021)	≥5% weight loss	Post	ACT	28.2% of patients
			CBT	26.0% of patients
		Follow-up	ACT	62.0% of patients
			CBT	40.8% of patients
			ACT x CBT	$OR = 2.32$ , CI 95%: 1.19, 4.61 (likelihood to achieve)
			ACT x CBT	$OR = 2.11$ , CI 95%: 1.08, 4.19 (likelihood to maintain)
Cosio and Schafer (2015)	Pain interference	Post	Difference	$t(50) = 2.20$ , $p = 0.03$ , $d = 0.26$
	Illness-focused coping	Post	Difference	$t(50) = 3.10$ , $p = 0.01$ , $d = 0.38$
	Global distress	Post	Difference	$t(50) = 4.39$ , $p = 0.01$ , $d = 0.42$
Godfrey et al. (2020)	Functional capacity	3-months follow-up	Difference	1.07 point ( $p = .037$ , CI 95%: -2.08, -0.07, $d = 0.2$ )

Authors (year)	Variable	Time point	Group	Effects
Hoffman et al. (2021)	Health anxiety	6-months follow-up	Difference	Cohen's $d = 0.80$ (CI 95%: 0.38, 1.23) 19.0 points (CI 95%: 10.8, 27.2, $p < 0.001$ ) $NNT = 2.8$ (CI 95%: 1.8, 6.1, $p < 0.001$ )
	Illness worry	6-months follow-up	Difference	Cohen's $d = 0.95$ (CI 95%: 0.52, 1.39) 14.4 points (CI 95%: 8.6, 20.2, $p < 0.001$ )
	Depression	6-months follow-up	Difference	Cohen's $d = 0.45$ (CI 95%: 0.04, 0.86) 15.0 points (CI 95%: 7.3, 22.7, $p < 0.001$ )
	Anxiety	6-months follow-up	Difference	Cohen's $d = 0.31$ (CI 95%: -0.10, 0.72) 9.1 points (CI 95%: 1.0, 17.1, $p < 0.05$ )
	Physical symptoms	6-months follow-up	Difference	Cohen's $d = 0.33$ (CI 95%: -0.08, 0.74) 13.5 points (CI 95%: 6.3, 20.7, $p < 0.001$ )
	Quality of life	6-months follow-up	Difference	Cohen's $d = 0.62$ (CI 95%: 0.20, 1.03) -11.0 points (CI 95%: -17.5, -4.6, $p < 0.05$ )
	Psychological flexibility	6-months follow-up	Difference	Cohen's $d = 0.47$ (CI 95%: 0.06, 0.88) -12.8 points (CI 95%: -19.0, -6.6, $p < 0.001$ )
Kolahdouzan et al. (2020)	Avoidance of death	Post	Difference	$\eta^2_p = 0.004$ , $p = 0.314$
	Quality of life	Post	Difference	$\eta^2_p = 0.630$ , $p = 0.010$
	Mental health	Post	Difference	$\eta^2_p = 0.003$ , $p = 0.329$
	Fear of death	Post	Difference	$\eta^2_p = 0.012$ , $p = 0.242$
	Acceptance and action	Post	Difference	$\eta^2_p = 0.858$ , $p = 0.001$

Authors (year)	Variable	Time point	Group	Effects
Kuwabara et al. (2020)	Dizziness	Post	Intervention	$d = 1.11$ (CI 95%: 0.80, 1.42)
	Vestibular balance	Post	Intervention	$d = 0.77$ (CI 95%: 0.32, 1.21)
	Anxiety	Post	Intervention	$d = 0.57$ (CI 95%: 0.26, 0.88)
	Depression	Post	Intervention	$d = 0.73$ (CI 95%: 0.36, 1.10)
	Avoidance	Post	Intervention	$d = 0.34$ (CI 95%: -0.04, 0.74)
	Mindfulness	Post	Intervention	$d = 0.55$ (CI 95%: 0.16, 0.94)
McCracken et al. (2005)	Pain	Post	Intervention	18.3% reduction
	Depression	Post	Intervention	42.2% reduction
	Pain-related anxiety	Post	Intervention	18.3% reduction
	Physical disability	Post	Intervention	25.0% reduction
	Psychosocial disability	Post	Intervention	39.3% reduction
	Daytime rest	Post	Intervention	61.8% reduction
	Walking speed	Post	Intervention	15.9% improvement
	Sit-to-stand performance	Post	Intervention	48.2% improvement
Mo'tamedi et al. (2012)	Affective distress	Post	Difference	$d = 2.54$
	Disability	Post	Difference	$d = 0.93$

Authors (year)	Variable	Time point	Group	Effects
	Sensory dimension of pain intensity	Post	Difference	$d = 0.28$
	Pain intensity	Post	Difference	$d = 1.35$
Najvani et al. (2015)	Depression	Post	Difference	$\eta^2 = 0.76, p = 0.001$
	Psychological flexibility	Post	Difference	$\eta^2 = 0.78, p = 0.001$
Pedersen et al. (2019)	Global health improvement	Follow-up	ACT x Control 1	$OR = 2.9$ (CI 95%: 1.4, 6.2, $p = 0.006$ )
Rose et al. (2023)	Neuromuscular quality of life	3 weeks	Difference (ITT)	$SMD = -0.45$
		6 weeks		$SMD = -0.54$
		9 weeks		$SMD = -0.71$
Sahebari et al. (2019)	Disappointment	Post	Difference	$\eta = 0.85$ ( $p < 0.001$ )
	Psychological distress	Post	Difference	$\eta = 0.80$ ( $p < 0.001$ )
	Psychasthenia	Post	Difference	$\eta = 0.79$ ( $p < 0.001$ )
Sheibani et al. (2019)	Positive strategies of cognitive emotion regulation	Post	Difference	$F = 10.25, p < 0.05, \eta^2 = 0.29$
	Negative strategies of cognitive emotion regulation	Post	Difference	$F = 4.47, p < 0.05, \eta^2 = 0.15$
Trindade et al. (2020)	Psychological health	Post	Difference	Hedges' $g = 0.79$

Authors (year)	Variable	Time point	Group	Effects
	Physical health			Hedges' $g = 0.16$
	Quality of social relationships			Hedges' $g = 0.42$
	Depression symptoms			Hedges' $g = 0.42$
	Stress			Hedges' $g = 0.32$
Wetherell et al. (2011)	Pain interference	Post	ACT	$\beta = -0.06; SE = 0.02; p = 0.02$
			CBT	$\beta = -0.09; SE = 0.02; p < 0.001$
	Depression	Post	ACT	$\Delta M = -2.32, t(56) = -2.98, p = 0.004$
			CBT	$\Delta M = -3.18, t(56) = -3.76, p < 0.001$
	Pain-related anxiety	Post	ACT	$\Delta M = -4.51, t(56) = -3.74, p < 0.001$
			CBT	$\Delta M = -5.63, t(56) = -3.02, p = 0.004$
Witlox et al. (2021)	Anxiety	Post	Blended ACT	$d = 0.96$
			CBT	$d = 1.09$
	Positive mental health	Post	Blended ACT	$d = 0.24$
			CBT	$d = 0.38$

Authors (year)	Variable	Time point	Group	Effects
	Depression	Post	Blended ACT	$d = 0.70$
			CBT	$d = 0.75$
	Work disability	Post	Blended ACT	$d = 0.67$
			CBT	$d = 0.82$
	Social life disability	Post	Blended ACT	$d = 0.75$
			CBT	$d = 0.63$
	Home disability	Post	Blended ACT	$d = 0.76$
			CBT	$d = 0.71$

*Note.*  $\eta^2$  = squared eta;  $\eta^2_p$  = partial squared eta;  $d$  = effect size; ITT = intention to treat; NNT = numbers needed to treat; OR = odds ratio; SMD = standardized mean difference