Positive Psychological Internet- and Mobile-Based Interventions (IMIs) for the Treatment of Psychological Disorders in Adults: A Scoping Review

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Abstract

Positive Psychological Interventions (PPIs) aim to enhance well-being by cultivating psychological strengths, resources, and positive emotions. While analog PPIs have demonstrated small to moderate effects on well-being and distress in both clinical and non-clinical populations (Carr et al., 2024, Chakhsiss et al., 2018), their digital counterparts, Positive Psychological Internet- and Mobile-based Interventions (PP-IMIs), remain underexplored in clinical settings. This scoping review synthesized current evidence on the characteristics, clinical applications, and reported outcomes of PP-IMIs in adults with psychological disorders. Following PRISMA-ScR guidelines, five eligible studies were identified, targeting depression (n = 3), Autism Spectrum Disorder (n = 1), and Alcohol Use Disorder (n = 1). Most studies employed exploratory designs, with substantial heterogeneity in intervention components, delivery formats, and outcome measures. All interventions were self-guided and web-based, with no mobile app–based implementations, and primarily targeted domains such as gratitude, self-compassion, strengths use, and savoring. Preliminary findings suggest that PP-IMIs are generally acceptable and feasible, with promising short-term effects on depressive symptoms, emotion regulation, and well-being. However, the current evidence base is limited by a lack of controlled trials, standardized outcome measures, long-term follow-up, and representation of a broader range of diagnoses such as anxiety and severe mental illness. Future research should focus on developing tailored, mobile-accessible PP-IMIs, establishing core outcome frameworks, and evaluating sustained impact and scalability across diverse clinical populations.

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Positive Psychological Internet- and Mobile-Based Interventions (IMIs) for the

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The global rise in mental health problems, combined with limited therapeutic resources, has created an urgent need for accessible and scalable treatment options (World Health Organization, 2021). According to the World Health Organization (WHO), one in eight people worldwide requires mental health support. However, significant gaps in healthcare systems often prevent these needs from being adequately addressed. Barriers to mental healthcare access include structural limitations, resource shortages, socioeconomic inequalities, geographical challenges, and cultural stigmatization (Mongelli et al., 2020; Wainberg et al., 2017).

Digital Mental Health: The Role of IMIs

Over the past two decades, digital mental health services have emerged and gained increasing recognition for their potential to enhance treatment accessibility (Appleton et al., 2020). Among these innovations, Internet- and Mobile-based Interventions (IMIs) have emerged as promising alternatives to traditional in-person therapy. IMIs are interventions delivered via online platforms or mobile applications, enabling users to engage with therapeutic content autonomously. These interventions typically use psychoeducational materials, self-help exercises, and homework assignments presented in small, structured modules intended to be completed regularly (Domhardt et al., 2020). IMIs generally limit direct therapeutic interaction to offering feedback or guidance, rather than involving therapists in active treatment. Where included, guidance may range from synchronous methods, such as live chats, to less personal asynchronous formats, such as email feedback. Compared to in-person therapy, IMIs offer greater flexibility, broader reach, lower access thresholds, and improved resource efficiency. Importantly, IMIs have demonstrated similar efficacy in treating common psychological conditions, including anxiety, depression, stress,

and pain management (Dworschak et al., 2022; Jimenez-Molina et al., 2019; Sander et al., 2016; Wang & Zhang, 2023).

These findings underscore the potential of IMIs to overcome barriers such as geographical distance, stigma, and limited resources, thereby improving access to mental health treatments (Domhardt et al., 2020). However, like many digital interventions, IMIs face challenges in maintaining user engagement and adherence, with high dropout rates commonly reported across studies. These challenges highlight that the research on IMIs is still evolving, particularly regarding identifying for whom, under what conditions, and in which formats these interventions are most effective.

The Potential of Positive Psychological IMIs

Traditionally, digital mental health interventions have primarily focused on symptom reduction, often relying on approaches such as cognitive behavioural therapy (cbt). In recent years, however, there has been growing interest in therapeutic approaches that aim to cultivate mental well-being. Positive Psychology has emerged as a strength-based and well-being centered framework that departs from the traditional medical model focused on diagnosing and treating illness (Chang et al., 2022). Rooted in the belief that all individuals possess inner resources and potential for growth, this field emphasizes the cultivation of well-being and the pursuit of a fulfilling life. This paradigm shift was initiated by Martin Seligman and Mihaly Csikszentmihalyi around the turn of the millennium. In their seminal article *Positive Psychology: An Introduction* (2000), they criticized the dominance of deficit-oriented research in psychology and called for a complementary focus on human strengths, personal development, and happiness.

Positive Psychological Interventions (PPIs) have attracted attention not only for their capacity to enhance well-being in the general population but also for their therapeutic potential in clinical contexts. A growing body of evidence suggests that PPIs can lead to

reductions in symptoms of depression anxiety and those associated with psychotic disorders, with clinical studies reporting small to moderate effects on psychological distress Chakhssi et al., 2018). Furthermore, research has demonstrated that higher levels of well-being can act as a protective buffer against the development of mental disorders such as anxiety, depression, or stress, and lower the likelihood of relapse (Carr et al., 2020; Chakhssi et al., 2018). These insights suggest that integrating PPIs into low-threshold, resource-efficient digital formats such as IMIs may be particularly promising. Individuals on therapy waitlists, for example, could benefit from early preventive effects, potentially reducing symptom progression, while individuals who have completed treatment could use such interventions to consolidate gains and prevent relapse.

Current Evidence and Gaps in Literature

Since their inception, PPIs have increasingly been adapted into digital self-help programs. Their structured, modular nature makes them particularly well-suited for delivery via IMIs. In the literature, the term *Online Positive Psychological Interventions (OPPIs)* is sometimes used; however, this label also includes formats outside the scope of IMIs. To ensure conceptual clarity, the present review adopts the term *Positive Psychological Internet- and Mobile-based Interventions (PP-IMIs)* to refer specifically to self-help interventions delivered via internet or mobile platforms. The emerging evidence base for PP-IMIs indicates promising outcomes, including increased well-being, enhanced positive affect, and reductions in depressive and anxiety symptoms (Menshawy, 2018; Auyeung & Mo, 2018). Despite these encouraging findings, most studies to date have focused on non-clinical or subclinical samples. Research examining the application and effectiveness of PP-IMIs in clinical populations remains scarce. Furthermore, reported effect sizes are often modest and inconsistent across studies, raising concerns about replicability and generalizability (White, Uttl, & Holder, 2019; Sin & Lyubomirsky, 2009). A key challenge lies in the heterogeneity of

PPIs themselves. Different interventions aim to activate different psychological mechanisms such as gratitude, meaning, or strengths use, which may vary in their effectiveness across populations and contexts (Bolier et al., 2013; Parks & Biswas-Diener, 2013). Aggregating outcomes across such varied approaches can obscure important differences in efficacy and may lead to premature conclusions (Bolier et al., 2013; White et al., 2019). Additionally, many digital interventions face difficulties in maintaining user engagement. High dropout rates are frequently reported and can undermine both clinical outcomes and ecological validity. Although guided formats have been proposed to improve adherence and effectiveness, the current evidence remains inconclusive regarding when and for whom guidance is most beneficial. Taken together, these limitations highlight the need for a more differentiated understanding of which types of PP-IMIs are effective for which clinical populations, under what conditions, and with what level of guidance. A more granular synthesis of this emerging body of research is essential to inform the design, implementation, and personalization of PP-IMIs in clinical mental health care.

Study Objectives

Considering the identified research gaps, the objective of this scoping review is to systematically map the existing literature on PP-IMIs targeting adult clinical populations. Specifically, the review aims to examine the study designs employed, the characteristics of the interventions (e.g., type of PPI, duration, delivery mode), the clinical populations addressed, and the reported clinical effects related to the enhancement of well-being and the reduction of psychological symptoms, including how these effects were assessed and measured. Furthermore, the review will explore the reported acceptability that is, how participants perceived and received the interventions (e.g., satisfaction, perceived usefulness, and willingness to engage), and feasibility, which refers to the practicality of delivering and implementing PP-IMIs in real-world settings. Feasibility is commonly assessed through

measures such as dropout and completion rates, technical usability, time commitment, and participant feedback on ease of use. In addition, it seeks to examine how guidance was described within the interventions, including its role, structure, and extent. By synthesizing these findings, the review aims to provide a comprehensive overview that can inform the future development, implementation, and personalization of PP-IMIs as preventive and adjunctive tools in clinical mental health care. The following research question and sub-questions have been formulated to guide this scoping review.

Research Questions

RQ 1: What study designs have been used to evaluate PP-IMIs in adult clinical populations, what were the characteristics of the targeted and what were the key characteristics of the interventions themselves?

RQ 2: What clinical effects on well-being enhancement and symptom reduction have been reported for different types of PP-IMIs when applied to specific psychological conditions or diagnostic groups in adult clinical populations, and how were these effects assessed?

RQ 3: What was reported about the acceptability and feasibility of interventions, and how were they measured in studies on PP-IMIs for adult clinical populations?

Positive Psychology: Key Concepts and Definitions

Before detailing the methodological approach, the following section outlines the conceptual foundations, resulting in a working definition of PPIs to ensure a precise and systematic literature search.

Defining Positive Psychological Interventions

Since the emergence of positive psychology, a wide range of PPIs have been developed, each employing diverse and multifaceted approaches to fostering human flourishing. This diversity makes defining PPIs a complex task, which is essential for ensuring conceptual clarity and consistency in this review. This study adopts the Schueller et

al. (2014) definition of PPIs, identifying interventions that aim to enhance well-being by targeting fundamental psychological needs, recognized in positive psychological theory as essential to well-being. This definition was chosen for its theoretical rigor and inclusivity, allowing for interventions that may have emerged outside the formal field of positive psychology, provided their primary objective is well-being enhancement. To determine whether an intervention aligns with this definition, this review assesses its primary goal to improve well-being and the variables targeted by the intervention.

Well-being is widely recognized as a multidimensional concept that is assessed through various constructs developed for measurement, some of which partially overlap. Traditionally, well-being has been understood through two primary perspectives: the hedonic and eudaimonic traditions, both rooted in ancient Greek philosophy (Ryff et al., 2021). The hedonic perspective emphasizes pleasure, life satisfaction, and the presence of positive emotions while minimizing negative emotions (Diener, 1984; Ryan & Deci, 2001). The eudaimonic perspective, in contrast, focuses on meaning, self-realization, and fulfilling one's potential (Ryff et al., 2021). In clinical research, well-being is commonly measured through three constructs: subjective well-being, which captures emotional experiences and life satisfaction; psychological well-being, which assesses meaning, purpose, and self-actualization; and quality of life (QoL), which reflects an individual's perception of overall well-being in their personal and cultural context. To qualify as a PPI, an intervention must have the explicit goal of enhancing well-being, which can be assessed through one or more of the aforementioned constructs. Other well-being constructs may also be considered, provided they are scientifically substantiated and align with the hedonic or eudaimonic traditions. To ensure that interventions align with positive psychology theory, this review examines whether they focus on well-established positive psychological needs.

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Key Theoretical Foundations of PPIs

Fulfilling Fundamental Psychological Needs (PERMA Model). Seligman's

PERMA model (2011) posits that well-being is achieved by satisfying five essential

psychological needs: Positive Emotions, Engagement, Relationships, Meaning, and

Accomplishment. Interventions targeting these domains have demonstrated positive effects

on well-being, in empirical studies. For example, gratitude exercises and savouring

interventions enhance positive emotions by increasing attention to and appreciation of

positive experiences (Lyubomirsky et al., 2005). Engagement, characterized by flow states,

can be fostered through activities that promote deep immersion and intrinsic motivation,

leading to greater life satisfaction (Csikszentmihalyi, 1990). Strong relationships are critical

for emotional support and social belonging, and interventions such as acts of kindness and

expressive writing improve social connectedness and reduce loneliness (Martela & Ryan,

2016). Meaning-making exercises, such as narrative interventions or purpose-oriented goal

setting, have been linked to greater psychological resilience and life satisfaction (Steger,

2009). Accomplishment-based PPIs, including strength-based coaching and goal setting,

enhance self-efficacy and long-term motivation (Sheldon & Elliot, 1999).

Cultivating Positive Emotions and Resilience (Broaden-and-Build Theory). The

Broaden-and-Build Theory (Fredrickson, 2001) posits that positive emotions expand

cognitive and behavioural repertoires, facilitating adaptive thinking, creativity, and social

bonds. Over time, repeated experiences of positive emotions build enduring psychological

resources, such as resilience and optimism, which help individuals cope with adversity

(Fredrickson et al., 2008). Interventions such as loving-kindness meditation, gratitude

journaling, and savouring exercises systematically cultivate positive emotions, which have

been shown to reduce depressive symptoms and increase life satisfaction (Fredrickson et al.,

2017). Moreover, studies indicate that experiencing positive emotions leads to physiological

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benefits, including reduced stress responses and improved cardiovascular health (Kok et al., 2013).

Developing Strengths and Resources. Strength-based interventions, grounded in Peterson and Seligman's (2004) Theory of Virtues and Strengths, focus on identifying and utilizing personal strengths such as gratitude, kindness, and perseverance. Research shows that applying one's signature strengths leads to increased well-being, greater job satisfaction, and improved relationships (Seligman et al., 2005). Strength-based coaching and interventions, including goal-setting and character-building exercises, have been shown to enhance self-efficacy and motivation (Linley & Harrington, 2006). Additionally, PPIs that emphasize prosocial behaviour, such as acts of kindness and gratitude exercises, enhance social bonds and increase perceived social support, which serves as a buffer against psychological distress (Nelson et al., 2016). Engaging in altruistic behaviours has been linked to improved mood and long-term well-being (Martela & Ryan, 2016), reinforcing the importance of social connectedness in positive psychology. In summary, interventions can be classified as PPIs if they are explicitly designed to enhance well-being, focusing on fulfilling fundamental psychological needs, cultivating positive emotions and psychological resilience, or developing personal strengths and external resources.

Methods

Research Design

A scoping review was chosen as the appropriate research method to address the research question regarding the current state of research on PP-IMIs across various conditions in adult clinical populations. Scoping reviews are a form of knowledge synthesis situated within the exploratory branch of literature reviews (Sutton et al., 2019). They aim to comprehensively map existing literature on broad topics, applying inclusive eligibility criteria to encompass diverse study designs and sources (Arksey & O'Malley, 2005). The goal of

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scoping reviews is to inform practice, programs, and policy, and to guide future research

priorities (Colquhoun et al., 2014). This broad focus is especially appropriate for research

fields where the current state of evidence is unclear. In this review, a scoping methodology is

used to explore research on PP-IMIs, to provide an overview of the existing literature, and to

identify gaps that can inform future studies evaluating the clinical applicability of PP-IMIs.

Search Strategy

To identify relevant literature, five scientific databases were manually searched: Web

of Science, Scopus, PubMed, PsycINFO, and Google scholar. Web of Science and Scopus

were selected due to their broad interdisciplinary coverage of journals across health,

psychology, and technology. PubMed and the Cochrane Library were included because of

their focus on healthcare-related research. PsycINFO was chosen for its comprehensive

coverage of psychological research. In addition, Google Scholar was used to supplement the

database searches and identify potentially relevant publications not indexed in the other

sources. Additionally, The Journal of Positive Psychology was searched to further increase

the pool of positive psychological studies. The search strategy incorporated broad terms

related to Internet- and Mobile-based interventions, positive psychological constructs, well-

being, and clinical populations. A detailed search string combining controlled vocabulary and

free-text terms was developed for each database and adapted as necessary (see Appendix A).

Eligibility Criteria

The PCC framework was used to develop the research question, as well as during the

first search stages to refine the eligibility criteria. Table 1 presents the inclusion and exclusion

criteria applied during study selection.

Population:

Studies were included if they targeted adults between 18 and 65 years of age with

either a psychological disorder that was based on the criteria of the Diagnostic Statistical

Manual (DSM) or International Statistical Classification of Diseases and Related Health Problems (ICD), or clinically significant psychological symptoms assessed through validated screening instruments. Studies were excluded if they focused on children, elderly populations (≥65 years), or healthy/non-clinical samples. Studies that focused on chronic pain or other disorders (that were not psychological), as this study was interested in the evidence of PP-IMIs for psychological treatment. Including them would further complicate the review.

Concept:

Interventions had to target fundamental psychological needs recognized in positive psychological theory with the primary aim of enhancing well-being. Interventions that included problem-focused, deficit-oriented, or solution-focused components were excluded. To check the well-being enhancement goal. Studies had to report at least one outcome related to well-being, measured through an empirically validated psychological measurement before and after treatment.

Context:

Interventions had to be fully delivered via an Internet website or Mobile application. They had to be performed primarily autonomously by participants utilizing self-help exercises. Interventions that included active treatments by therapists that went beyond guidance or feedback were excluded. Blended treatments were excluded as the review was interested in the evidence base for PP-IMIs, which would be difficult to distinguish in blended formats.

Additional:

Studies included had to be primary outcome studies, peer-reviewed journal, and written in English.
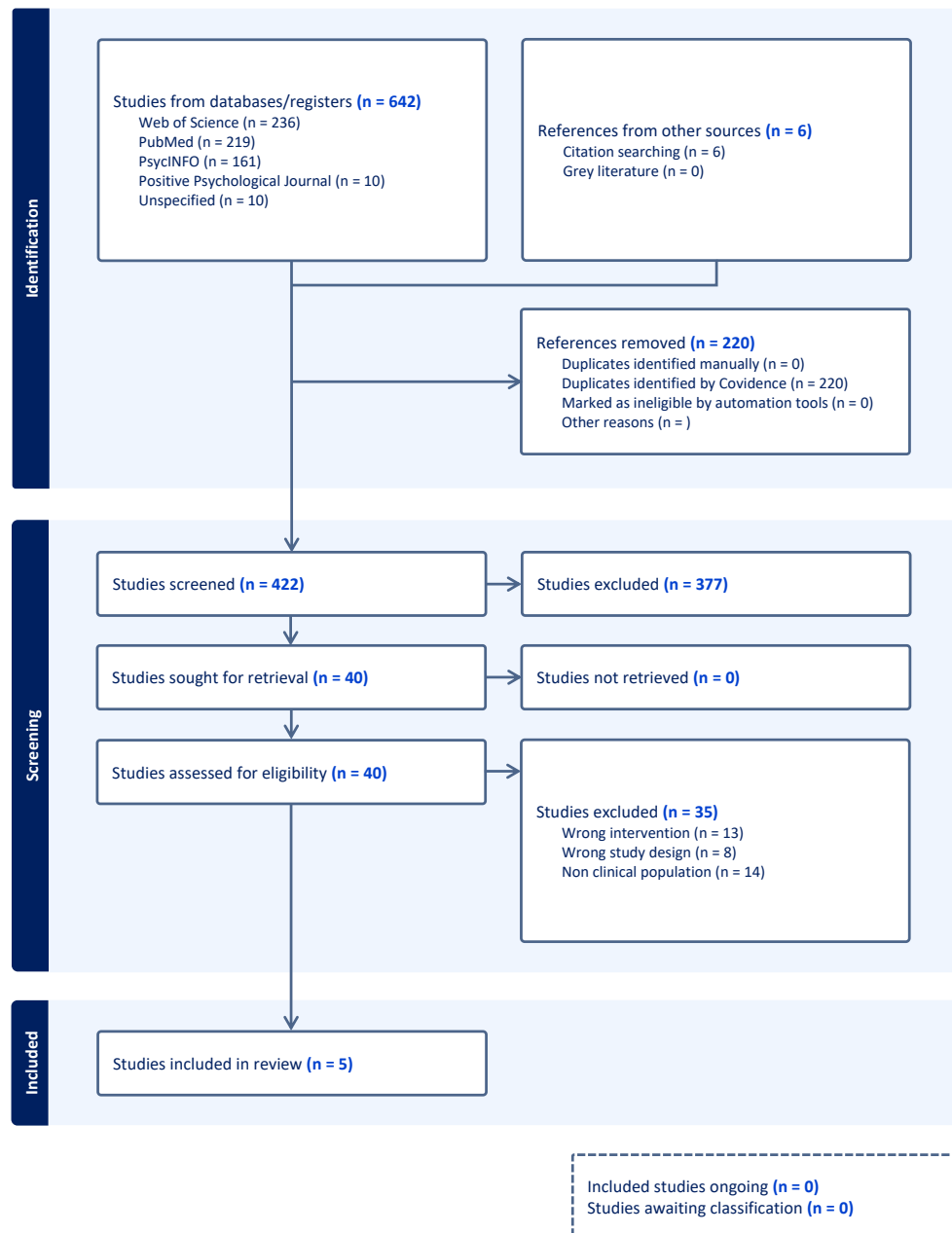
Table 1

Eligibility criteria

Category	Inclusion Criteria	Exclusion Criteria
Population	Adults aged 18–65 years Psychological disorder (DSM OR ICD criteria) / Clinically significant psychological symptoms measured by validated screening tools.	Patients with chronic pain or other non-psychological disorders
Concept	Interventions aim to enhance well-being targeting fundamentally positive psychological needs.	Interventions that include problem-focused, deficit-oriented, or solution-focused approach
Context	Interventions fully delivered via Internet or Mobile platforms. Primarily self-help interventions	Interventions that include active treatments by therapists Blended treatments
Additional	Peer-reviewed primary outcome studies Published in English.	

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Study Selection

A total of 642 studies were initially identified through systematic research. Following

title/abstract screening and full-text eligibility assessment, five studies were included in the

final review. The study selection process is depicted in the PRISMA flow diagram.

Results

Study Design

The five studies included in this review were published between 2015 and 2022 (see Table 2). Two studies (40%) employed randomized controlled trial (RCT) designs, one of which included a placebo control (Krentzman et al., 2015), and one used a waitlist control (Moskowitz et al., 2022). Two studies (40%) used mixed-methods single-group pilot designs without control groups (Cai et al., 2024; Görges et al., 2018). One study (20%) employed a mixed-methods single-case experimental design with multiple baselines (Loerinc et al., 2018). Three of the five studies (60%) were identified as pilot studies. Three studies were conducted in the United States (n = 3, 60%), with one study conducted in Germany (n = 1, 20%) and one in Australia (n = 1, 20%). Sample sizes ranged from 6 to 539 participants, with a median sample size of 39. Target populations were adult clinical samples diagnosed with depressive disorders (n = 3, 60%), alcohol use disorder (AUD; n = 1, 20%), and autism spectrum disorder (ASD; n = 1, 20%). All studies evaluated intervention efficacy, and most also assessed feasibility and acceptability. Each study included pre- and post-intervention outcome measurement. Three of the five studies incorporated follow-up assessments: Krentzman et al. (2015) conducted a 2-month follow-up; Moskowitz et al. (2022) conducted 1- and 3-month follow-ups; and Görges et al. (2018) conducted a 3-month follow-up. Two studies (Loerinc et al., 2018; Cai et al., 2024) did not include follow-up assessments.

Table 2

Study Design

First author, Year, Country	Research method	Study aim	Population	Control condition (follow up)	Follow up
Cai et al. (2024), Australia	Mixed methods single-group pilot	acceptability and effectiveness of online self-compassion program on autism	N = 39 adults with autism spectrum disorder (ASD)	no control	no follow-up
Görges et al. (2018), Germany	Mixed methods single-group pilot	acceptability and effectiveness of multicomponent PPI for mild to moderate depression	N = 81 adults with mild to moderate depression	no control	after 3-months
Krentzman et al. (2015), USA	Mixed methods RCT	acceptability and effectiveness of gratitude intervention in AUD treatment	N = 23 adults with Alcohol Use Disorder (AUD)	placebo	after 2-months

First author, Year, Country	Research method	Study aim	Population	Control condition (follow up)	Follow up
Loerinc et al. (2018), USA	Mixed methods single-case design with multiple baselines	acceptability and effectiveness of positive affect treatment for depression	N = 6 adults with depression	no control	no follow-up
Moskowitz et al. (2022), USA	RCT	effectiveness of multicomponent PPI and emotional mediators in depression	N = 539 adults with elevated depressive symptoms	waitlist	after 1 and 3 months

Note. This table summarizes the methodological designs, clinical populations, and control conditions of the included studies. It highlights variation in study rigor and the limited use of follow-up assessments or control groups. PHQ = Patient Health Questionnaire; SCID-5 = Structured Clinical Interview for DSM-5.

Population Characteristics

The included studies targeted a range of adult clinical populations (see Table 3). Three studies (Görges et al., 2018; Loerinc et al., 2018; Moskowitz et al., 2022) focused on individuals with depressive symptoms or Major Depressive Disorder (MDD), one study (Krentzman et al., 2015) included participants with Alcohol Use Disorder (AUD), and one study (Cai et al., 2024) targeted autistic adults with self-reported mental health difficulties. Selection of participants was based on validated clinical diagnostic tools and symptom thresholds. Depression studies employed well-validated tools such as the PHQ-9 (Görges et al., 2018), the SCID-5 and DASS (Loerinc et al., 2018), and the CES-D (Moskowitz et al., 2022) to identify participants with elevated depressive symptoms. The AUD study included participants meeting DSM-IV criteria for AUD (Krentzman et al., 2015). The autism study recruited adults with a formal autism diagnosis and self-reported mental health concerns (Cai et al., 2024). Across studies, symptom severity at baseline varied. In Cai et al. (2024), participants reported mild to moderate depressive symptoms and moderate to severe anxiety symptoms. In Görges et al. (2018), participants were grouped into mild or moderate depression based on screening. Krentzman et al. (2015) reported mild depressive symptoms and mild to moderate anxiety among participants with AUD. Loerinc et al. (2018) included six individuals with MDD, with symptom severity varying across cases. Moskowitz et al. (2022) included a large community sample with moderate depressive symptoms.

Mean participant ages ranged from 38.3 to 46.3 years across studies. Gender distributions varied, with some studies reporting predominantly female samples (e.g., Görges et al., 2018; Cai et al., 2024; Moskowitz et al., 2022), while others included more balanced gender proportions (Krentzman et al., 2015; Loerinc et al., 2018).

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Table 3

Population Characteristics

First author, Year,	N	Clinical condition	Diagnostic criteria	Symptoms at Baseline	Mean Age (SD)	Gender			
						female	male	non-binary	agender
Cai et al. (2024)	39	Autism spectrum disorder	Formal autism diagnosis self-reported mental health concerns	Depression * / ** Anxiety ** / ***	45.28 (11,92)	13%	72%	13%	3%
Görges et al. (2018)	81	MDD, Dysthymia	PHQ-9 ≥ 11 past or current diagnosis of depression or dysthymia	Group 1: depression* Group 2: depression**	45.6 (11,20)	87.7%	12.3%	/	/
Krentzman et al. (2015)	23	Alcohol use disorder	DSM-IV AUD diagnosis	Depression * Anxiety * / **	46.3 (10,9)	47.8%	52.2%	/	/

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First author, Year,	N	Clinical condition	Diagnostic criteria	Symptoms at Baseline	Mean Age (SD)	Gender			
						female	male	non-binary	agender
Loerinc et al. (2018)	6	Major depressive disorder	SCID-5 depression diagnosis DASS ≥ 11	Depression * / ***	41.17 (9.28)	66.7%	33.3%	/	/
Moskowitz et al. (2022)	539	Elevated depressive symptoms	PHQ-8 ≥ 4	Depression **	38.3 (13,6)	73.6%	25.5%	/	/

This table outlines the demographic and clinical characteristics of participants included in each study. It includes diagnostic criteria, baseline symptom severity, age, and gender distribution to provide context for interpreting study outcomes. Abbreviations: PHQ = Patient Health Questionnaire; SCID-5 = Structured Clinical Interview for DSM-5; DASS = Depression Anxiety Stress Scale; MDD = Major Depressive Disorder; AUD = Alcohol Use Disorder; DSM-IV = Diagnostic and Statistical Manual of Mental Disorders, 4th Edition; DSM-5 = Diagnostic and Statistical Manual of Mental Disorders, 5th Edition. Symptom severity: * = mild, ** = moderate, *** = severe.

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Intervention Characteristics

The interventions investigated across the five included studies were all delivered as self-guided online programs via web-based platforms (see Table 4). None of the interventions utilized mobile applications. Intervention length varied across studies, ranging from 2 weeks (Krentzman et al., 2015) to 9 weeks (Loerinc et al., 2018). Two interventions were structured as 5-week programs (Moskowitz et al., 2022; Cai et al., 2024), and one as a 7-week program (Görges et al., 2018). Intervention pacing also varied: some studies implemented daily exercises (Krentzman et al., 2015; Moskowitz et al., 2022), while others followed a weekly module format (Cai et al., 2024; Görges et al., 2018), or twice-weekly sessions (Loerinc et al., 2018). Module progression was either flexible (Cai et al., 2024), only possible when the previous module was completed (Görges et al., 2018), or session-based with a recommended pacing (Loerinc et al., 2018). Moskowitz et al. (2022) used a flexible release format, introducing 1–3 new skills each week with additional daily diary bursts. The content of the interventions reflected a range of Positive Psychology Intervention (PPI) techniques. Across studies, these included self-compassion exercises (Cai et al., 2024), gratitude practices (Krentzman et al., 2015; Görges et al., 2018; Moskowitz et al., 2022), acts of kindness and generosity (Görges et al., 2018; Loerinc et al., 2018; Moskowitz et al., 2022), goal setting (Görges et al., 2018), being mindful about positive events and savoring (Görges et al., 2018; Moskowitz et al., 2022), using personal or signature strengths (Görges et al., 2018; Moskowitz et al., 2022), optimism (Görges et al., 2018), loving-kindness and compassion meditation (Loerinc et al., 2018), appreciative joy (Loerinc et al., 2018), engaging in enjoyable and meaningful activities (Loerinc et al., 2018; Moskowitz et al., 2022), and capitalizing on positive experiences (Moskowitz et al., 2022). These components aimed to enhance key domains of positive functioning, including positive affect, emotion regulation, resilience, engagement, meaning, life satisfaction, and overall wellbeing. Guidance / support

varied across interventions. In three studies, support was limited to automated email reminders (Loerinc et al., 2018; Krentzman et al., 2015) or daily emotion reporting prompts integrated into the intervention platform (Moskowitz et al., 2022), serving to encourage adherence. In Görges et al. (2018), weekly mood monitoring was conducted by phone or email to ensure participant safety and monitor engagement. Cai et al. (2024) provided the highest level of personalized support, offering brief weekly one-on-one check-ins conducted via email, phone, or zoom, in addition to the self-guided program, helping participants deal with technical or personal obstacles.

Across the included studies, a range of Positive Psychology components were employed, with some techniques being applied across multiple diagnostic groups and others used more selectively (see table 5). Gratitude-based exercises were the most frequently implemented component, appearing in interventions for depression (Görges et al., 2018; Moskowitz et al., 2022) and alcohol use disorder (Krentzman et al., 2015). Acts of kindness and generosity were similarly included across interventions for depression (Görges et al., 2018; Moskowitz et al., 2022) and alcohol use disorder (Krentzman et al., 2015). Self-compassion exercises were uniquely used in an intervention targeting autism spectrum disorder (Cai et al., 2024). Several components appeared only in interventions for depression. These included goal setting (Görges et al., 2018), being mindful about positive events and savoring (Görges et al., 2018; Moskowitz et al., 2022), capitalizing on positive experiences (Moskowitz et al., 2022), using signature strengths (Görges et al., 2018; Moskowitz et al., 2022), optimism (Görges et al., 2018), engaging in enjoyable and meaningful activities (Loerinc et al., 2018; Moskowitz et al., 2022), and loving-kindness / compassion meditation (Loerinc et al., 2018). When mapped against the PERMA model, the most frequently targeted components across interventions were Positive Emotion and Relationships, followed by Meaning, Engagement, Resilience, and Accomplishment. Interventions for depression were

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the most comprehensive in their use of diverse PPI components, while interventions for

autism and alcohol use disorder each focused on a narrower selection of techniques.

Table 4

Intervention characteristics

Author(s), Year, Intervention	Delivery mode	Positive psychological exercises	Structure (duration & pacing)	Guidance / Support
Cai et al., 2024, Aspect Self-compassion Program for Autistic Adults (ASPAA)	Web	Self-compassion	5 modules; ~1 module per week recommended (flexible pacing)	Weekly brief individual check-ins (email/phone/Zoom)
Görges et al., 2018, GET.HAPPY	Web	Gratitude, Acts of kindness / Generosity, Goal setting, Being mindful about positive events & Savoring, Using signature strengths, Optimism	7 modules; 1 module per week; module completion required	Weekly mood monitoring via phone or email
Krentzman et al., 2015, Gratitude (Three Good Things)	Web	Gratitude	2 weeks; daily practice; compensation for completed entries	Daily email reminders (automated)
Loerinc et al., 2018, Positive Affect Treatment (PAT)	Web	Engaging in enjoyable and meaningful activities, Loving-kindness / Compassion meditation, Acts of kindness / Generosity, Gratitude, Appreciative joy	9 weeks; 15 sessions (2 sessions per week)	Weekly email reminders (automated)

Author(s), Year, Intervention	Delivery mode	Positive psychological exercises	Structure (duration & pacing)	Guidance / Support
Moskowitz et al., 2022, MARIGOLD	Web	Being mindful about positive events & Savoring, Capitalizing, Gratitude, engaging in enjoyable and meaningful activities, Using signature strengths, Acts of kindness / Generosity	5 weeks; 1–3 new skills released weekly; 7-week diary bursts	Daily emotion reporting prompts (automated)

Note. This table summarizes the delivery format, intervention content, pacing, and level of support for each PP-IMI included in the review.

Table 5

Mapping of Positive Psychology components across disorders

Exercise / Technique	PERMA Component					Clinical conditions		
	Positive Emotion	Engagement	Relationships	Meaning	Accomplishment	Depression (N)	ASD (N)	AUD (N)
Self-compassion	X	-	-	-	-	-	39	-
Gratitude	X	-	X	X	-	620	-	23
Acts of kindness / Generosity	X	-	X	X	-	620		23
Goal setting	-	-	-	X	X	81		-
Being mindful about positive events & Savoring	X	-	-	-	-	620		-
Capitalizing (sharing positive experiences)	X	-	X	-	-	539		-
signature strengths	-	X	-	X	X	620		-
Optimism	X	-	-	X	-	539	-	-
Engaging in enjoyable and meaningful activities	X	X	-	-	-	545	-	-

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Exercise / Technique	PERMA Component					Clinical conditions		
	Positive Emotion	Engagement	Relationships	Meaning	Accomplishment	Depression (N)	ASD (N)	AUD (N)
Loving-kindness / Compassion meditation	X	-	X	X	-	6	-	-

Note. This table maps specific Positive Psychology exercises used in the included PP-IMI studies to the PERMA model and corresponding

clinical populations. Exercises were classified into PERMA domains based on theoretical alignment and intervention descriptions. Participant

numbers (N) represent the sample size per disorder per intervention to illustrate implementation scope.

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Clinical Outcomes

The included studies targeted a range of clinical outcomes, spanning both symptom reduction and enhancement of well-being (see Table 6). All five studies assessed changes in depressive symptoms as a primary or secondary outcome. Additionally, anxiety symptoms were assessed in two studies (Cai et al., 2024; Loerinc et al., 2018), and negative affect was examined in three studies (Cai et al., 2024; Krentzman et al., 2015; Moskowitz et al., 2022). Emotion regulation difficulties were assessed in Cai et al. (2024). Regarding well-being outcomes, all five studies incorporated measures of positive affect. Self-compassion was assessed in two studies (Cai et al., 2024; Loerinc et al., 2018). Satisfaction with mental health was assessed in Görges et al. (2018), while broader psychological well-being was measured in Cai et al. (2024) using the Warwick–Edinburgh Mental Well-being Scale (WEMWBS). Krentzman et al. (2015) assessed unactivated positive affect (feelings of calm and ease) and dispositional gratitude. Emotional flexibility was examined in Moskowitz et al. (2022). A range of validated measurement instruments was employed across studies. Symptom outcomes were commonly assessed using tools such as the Patient Health Questionnaire (PHQ-9), Center for Epidemiologic Studies Depression Scale (CES-D), Depression Anxiety Stress Scales (DASS-21), Structured Clinical Interview for DSM-5 Disorders (SCID-5), and the Inventory of Depressive Symptomatology (IDS-SR). Well-being outcomes were measured using the Self-Compassion Scale (SCS), Warwick–Edinburgh Mental Well-being Scale (WEMWBS), Gratitude Questionnaire (GQ-6), Short Form Health Survey (SF-12), and the Positive and Negative Affect Schedule (PANAS). Assessment timing varied. All studies included pre- and post-intervention assessments. Three studies (Görges et al., 2018;

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Krentzman et al., 2015; Moskowitz et al., 2022) incorporated follow-up assessments, with time points ranging from two to three months post-intervention.

Overall, two studies reported reductions in depressive symptoms among participants with depression (Loerinc et al., 2018; Moskowitz et al., 2022) and among autistic adults (Cai et al., 2024). Similarly, reductions in negative affect were observed in autistic adults (Cai et al., 2024), in individuals with Alcohol Use Disorder (Krentzman et al., 2015), and in individuals with depression (Moskowitz et al., 2022). Improvements in positive affect were reported across four studies: among autistic adults (Cai et al., 2024), individuals with depression (Loerinc et al., 2018; Moskowitz et al., 2022), and individuals with Alcohol Use Disorder (Krentzman et al., 2015). Self-compassion increased in autistic adults (Cai et al., 2024) and in individuals with depression (Loerinc et al., 2018). Satisfaction with mental health improved in individuals with depression (Görges et al., 2018), while emotion regulation difficulties decreased in autistic adults (Cai et al., 2024). Some outcomes, such as dispositional gratitude in individuals with Alcohol Use Disorder (Krentzman et al., 2015) and emotional flexibility in individuals with depression (Moskowitz et al., 2022), showed mixed or non-significant changes.

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Table 6

Clinical outcomes and measurements instruments across studies

Population (Author, year)	Symptom outcomes reported	Symptom measures	Well-being outcomes reported	Well-being measures
Autism (Cai et al., 2024)	Anxiety ↓ depression ↓ emotion regulation ↑ negative affect ↓	DERS, DSM-5 GAD-D, PANAS (negative affect)	self-compassion ↑ positive affect↑ psychological well-being ↑	SCS, PANAS (positive affect), PHQ-9, WEMWBS
Depression (Görges et al., 2018)	Depression ↓	IDS-SR, PHQ-9	Satisfaction with mental health ↑	SF-12
Alcohol use disorder (Krentzman et al., 2015)	negative affect ↓	PANAS (negative affect)	unactivated positive affect (feeling calm, at ease) ↑ dispositional gratitude over time ↔	GQ-6, PANAS (positive affect & serenity subscale)
Depression (Loerinc et al., 2018)	Depression ↓ anxiety ↓	DASS-21, SCID-5, MASQ-A, BADS, PHQ-2, PANAS (negative affect)	positive affect ↑ self-compassion ↑ behavioral activation ↑	SCS, PANAS (positive affect)
Depression (Moskowitz et al., 2022)	Depression ↓	CES-D	Positive affect (past week, past day, reactivity, flexibility) ↔ Negative affect (past week, past day, reactivity) ↓	DES

Note. This table summarizes the symptom and well-being outcomes reported in each included study, along with the measurement instruments

used. ↓ = decrease, ↑ = increase, ↔ = no change. Abbreviations: DERS = Difficulties in Emotion Regulation Scale; DSM-5 GAD-D = DSM-5

Generalized Anxiety Disorder Diagnosis; PANAS = Positive and Negative Affect Schedule; SCS = Self-Compassion Scale; PHQ-9 = Patient Health Questionnaire-9; WEMWBS = Warwick–Edinburgh Mental Well-Being Scale; IDS-SR = Inventory of Depressive Symptomatology–Self-Report; SF-12 = Short Form Health Survey; GQ-6 = Gratitude Questionnaire; DASS-21 = Depression Anxiety Stress Scales–21; SCID-5 = Structured Clinical Interview for DSM-5; MASQ-A = Mood and Anxiety Symptom Questionnaire–Anhedonic Depression; BADS = Behavioral Activation for Depression Scale; PHQ-2 = Patient Health Questionnaire-2; CES-D = Center for Epidemiologic Studies Depression Scale; DES = Differential Emotions Scale.

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Acceptability and Feasibility

All included studies reported on aspects of acceptability and feasibility of the interventions (see Table 5). Overall, participant acceptability was described as promising across studies. In ASPAA (Cai et al., 2024), targeting autistic adults, 56% of participants rated the program as "good," 34% as "excellent," and 10% as "average," with 100% indicating they would recommend the program to others and intended to apply the skills learned. In GET.HAPPY (Görges et al., 2018), targeting individuals with depression, overall satisfaction was similarly positive, with 81% of participants reporting that they liked the modules and the majority indicating they would recommend the program. However, approximately 25% of participants felt that their problems were not sufficiently addressed, and certain modules (specifically Module 2: *Physical contact, Red light, Gratitude letter*) were perceived as more difficult, whereas Module 6 (*Making presents, Gratitude journal, Ten minutes of silence*) was rated as most beneficial. Three Good Things (Krentzman et al., 2015), targeting individuals with Alcohol Use Disorder, also reported favourable participant perceptions, with mean user-satisfaction ratings of approximately 6 to 8 out of 10, and 81.8% of participants indicating an intention to continue the exercise. Some participants noted that the activity occasionally felt like a chore but appreciated the reminders provided. Feasibility outcomes suggested that recruitment was generally effective across studies. ASPAA (Cai et al., 2024) enrolled 53 participants within three months, with an attrition rate of 26%, primarily due to personal reasons unrelated to program dissatisfaction. GET.HAPPY (Görges et al., 2018) reported a 23.5% attrition rate, with 58% of participants completing at least five out of seven modules. Three Good Things (Krentzman et al., 2015) reported high adherence, with 91% daily participation (mean of 12.8 out of 14 days completed), and only one participant dropped out. Acceptability and feasibility were assessed using a combination of post-program surveys,

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standardized instruments (e.g., CSQ-8), weekly module ratings, open-ended qualitative

feedback, and tracking of recruitment, participation, and attrition across studies.

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Table 6

Acceptability outcomes and measurements methods

Intervention (Author, Year)	Acceptability outcomes	How measured	Feasibility outcomes	How measured
ASPAA (Cai et al., 2024)	56% rated "good", 34% "excellent", 10% "average"; 100% would recommend; all intended to use skills and found program helpful for others	Post-program survey (Likert + Yes/No)	Recruitment successful: 53 enrolled in 3 months; 26% attrition (personal reasons)	Recruitment and attrition tracked; reasons recorded
GET.HAPPY (Görges et al., 2018)	Overall promising satisfaction; 81% liked modules; majority would recommend; ~25% felt problems not taken seriously	CSQ-8; weekly module ratings; qualitative feedback	Recruitment effective; 23.5% attrition; 58% completed ≥5/7 modules	Recruitment, attrition, and module completion tracked
Three Good Things (Krentzman et al., 2015)	TGT rated as satisfying, pleasant, helpful (mean ~6–8/10); sometimes felt like a chore; reminders valued; 81.8% intended to continue TGT	Day 14 survey (Likert 0–10); open-ended survey; qualitative interviews (14 weeks post)	High adherence: 91% daily participation; mean 12.8/14 days; 1 dropout	Daily participation tracked; attrition monitored; qualitative feedback
Positive Affect Treatment (Loerinc et al., 2018)	Overall high acceptability: flexibility and portability valued; lack of	Post-treatment survey (4 feasibility questions); qualitative feedback	4/6 participants completed intervention; variable adherence	Session completion tracked; qualitative feedback

Intervention (Author, Year)	Acceptability outcomes	How measured	Feasibility outcomes	How measured
	accountability noted; all participants would recommend (especially for those with financial/time barriers)			
Moskowitz et al., 2022, MARIGOLD	Not reported	Not reported	Large-scale recruitment (n=539 intervention); 54% retention at 3-month follow-up	Recruitment and attrition reported

Note. This table summarizes acceptability and feasibility outcomes across studies, including how these were assessed. Acceptability was primarily measured via post-intervention surveys (Likert ratings, qualitative feedback), while feasibility indicators included recruitment success, adherence, and attrition tracking. CSQ-8 = Client Satisfaction Questionnaire-8; TGT = Three Good Things.

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Discussion

Summary of Evidence

This scoping review synthesized current evidence on the characteristics, clinical

applications, and reported outcomes of Positive Psychological Internet- and Mobile-based

Interventions (PP-IMIs) in adult populations with psychological disorders.

Study Design, Population & Intervention Characteristics

The first objective of this review was to explore study designs, target populations, and

intervention characteristics. The PP-IMI literature for psychological disorders remains small

and methodologically heterogeneous. Only two studies used randomized controlled trials,

while the remainder were uncontrolled pilot or single-case designs. Most studies were

conducted in Western, high-income countries, limiting cultural generalizability, although

analog PPI research from non-Western settings has shown promising adaptability and

effectiveness (Hendriks et al., 2018). Most interventions targeted depressive symptoms,

reflecting trends in the analog literature, where depression remains the most researched

disorder (Sin & Lyubomirsky, 2009; Carr et al., 2024). Notably, no studies focused on anxiety

disorders, PTSD, OCD, or severe mental illnesses, despite evidence that analog PPIs can be

effective in populations with schizophrenia-spectrum, substance use, and anxiety disorders

(Chakhssi et al., 2018; Carr et al., 2024). This points to a missed opportunity to extend digital

PPIs to more complex diagnostic groups. Validated diagnostic tools were employed across

studies, enhancing methodological rigor. Intervention content varied but commonly included

gratitude, kindness, and savoring—targeting positive emotion and relationships in line with

the PERMA model. Interventions for depression were thematically more comprehensive,

while those for alcohol use disorder and autism were narrower, likely due to being

represented by single studies. Guidance ranged from automated prompts to brief one-on-one

support, though no study systematically tested its impact. Similarly, no studies compared

single- versus multicomponent interventions or evaluated effects across varying levels of symptom severity, leaving important questions about personalization and differential responsiveness unanswered. A notable omission was the complete absence of mobile app-based PP-IMIs. All interventions were delivered via web platforms, despite growing evidence that mobile formats offer increased accessibility, real-time adaptability, and effectiveness in improving mental health outcomes (Howells et al., 2016; Roepke et al., 2015; Kuhn et al., 2017).

Clinical Outcomes

The second objective addressed clinical outcomes and measurement strategies. Current evidence suggests that PP-IMIs can produce short-term improvements in depressive symptoms, negative affect, and well-being indicators such as positive affect and self-compassion. These results echo findings from analog PPIs, where small to moderate benefits on distress and well-being have been reported (Carr et al., 2024; Chakhssi et al., 2018). However, outcome domains in digital PPIs remain narrow, with limited focus on broader constructs such as purpose or psychological flexibility. Inconsistent outcome measures and short follow-up periods hinder comparison and limit conclusions about sustained effects. Future studies should standardize outcome frameworks to improve interpretability (Donaldson et al., 2015; Carr et al., 2020).

Acceptability and Feasibility

The third objective focused on user experience. Evidence indicates that PP-IMIs are generally acceptable and feasible. Participants reported satisfaction and willingness to recommend the programs. However, some felt their clinical concerns were insufficiently addressed, supporting existing critiques that generic PPIs may not meet the needs of more complex cases (Parks & Biswas-Diener, 2013; Schrank et al., 2014; Wood & Tarrier, 2010). Short-term engagement was moderate to high, but data on long-term feasibility and sustained

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use remain scarce. Additionally, there is considerable variability in how feasibility and acceptability are assessed across studies.

Methodological Limitations

The findings of this review should be interpreted considering several limitations. The number of included studies was small, and most used exploratory designs without active controls. Follow-up periods were short, and heterogeneity in design and outcomes complicates synthesis. The absence of mobile apps, limited exploration of guidance and intervention components, and the lack of research in non-Western settings further limit generalizability and scalability. Moreover, the scope of this review excluded studies focusing on somatic conditions, such as chronic pain or cancer, to ensure feasibility and focus on psychological disorders. While necessary, this exclusion may limit understanding of PP-IMIs' broader therapeutic potential.

Conclusion and Implications for Future Research

This review highlights the emerging but still limited evidence base for PP-IMIs in adult clinical populations. Available studies suggest these interventions are generally acceptable, feasible, and potentially effective in improving well-being and reducing symptoms—particularly in cases of depression, ASD, and AUD. Future research should expand to include anxiety, trauma-related, and severe mental disorders, test different support formats, integrate mobile-based platforms, and adopt standardized outcome frameworks. Longitudinal designs assessing long-term impact and real-world implementation will be essential to advance PP-IMIs into scalable mental health care.

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Appendices

Appendix A

Key Terms and Search Strings for Database Searches

This appendix outlines the search strings per database used to identify relevant studies for the

scoping review on Positive Psychological Internet- and Mobile-based Interventions (PP-

IMIs) in adult clinical populations.

1. PubMed Search String

(("Mobile*" OR "Web" OR "Web-based" OR "Internet*" OR "Online*" OR "Digital" OR

"App" OR "App-based" OR "Self-Help" OR "mHealth" OR "eHealth"))

AND ("well-being"[Title/Abstract] OR "wellbeing"[Title/Abstract] OR "psychological well-

being"[Title/Abstract] OR "subjective well-being"[Title/Abstract] OR "mental well-

being"[Title/Abstract] OR "quality of life"[Title/Abstract] OR "flourish*"[Title/Abstract] OR

"life satisfaction"[Title/Abstract] OR "emotional functioning"[Title/Abstract] OR

"psychological functioning"[Title/Abstract])

AND ("positive affect" OR "positive emotion" OR Strength OR Purpose OR Meaning OR

Resource OR Hope OR Gratitude OR Compassion OR self-compassion OR resilience OR

virtue OR "positive psy*")

AND (Intervention OR Treatment OR Therap*)

AND ("mental health disorder" OR "mental health illness" OR "mental disorder" OR "mental

illness" OR "psychiatric disorder" OR "psychiatric illness" OR "psychological disorder" OR

"psychological illness" OR "DSM-IV" OR "DSM-5" OR "ICD-10" OR "ICD-11")

2. Scopus Search String

(TITLE-ABS-KEY("Mobile*" OR "Web" OR "Web-based" OR "Internet*" OR "Online*"

OR "Digital" OR "App" OR "App-based" OR "Self-Help" OR "mHealth" OR "eHealth"))

AND (TITLE-ABS-KEY("well-being" OR "wellbeing" OR "psychological well-being" OR

"subjective well-being" OR "mental well-being" OR "quality of life" OR "flourish*" OR "life

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satisfaction" OR "emotional functioning" OR "psychological functioning"))

AND (TITLE-ABS-KEY("positive affect" OR "positive emotion" OR Strength OR Purpose

OR Meaning OR Resource OR Hope OR Gratitude OR Compassion OR "self-compassion"

OR resilience OR virtue OR "positive psy*"))

AND (TITLE-ABS-KEY(Intervention OR Treatment OR Therap*))

AND (TITLE-ABS-KEY("mental health disorder" OR "mental health illness" OR "mental

disorder" OR "mental illness" OR "psychiatric disorder" OR "psychiatric illness" OR

"psychological disorder" OR "psychological illness" OR "DSM-IV" OR "DSM-5" OR "ICD-

10" OR "ICD-11"))

3. Web of Science Search String

TS=("Mobile*" OR "Web" OR "Web-based" OR "Internet*" OR "Online*" OR "Digital" OR

"App" OR "App-based" OR "Self-Help" OR "mHealth" OR "eHealth")

AND TS=("well-being" OR "wellbeing" OR "psychological well-being" OR "subjective

well-being" OR "mental well-being" OR "quality of life" OR "flourish*" OR "life

satisfaction" OR "emotional functioning" OR "psychological functioning")

AND TS=("positive affect" OR "positive emotion" OR Strength OR Purpose OR Meaning

OR Resource OR Hope OR Gratitude OR Compassion OR "self-compassion" OR resilience

OR virtue OR "positive psy*")

AND TS=(Intervention OR Treatment OR Therap*)

AND TS=("mental health disorder" OR "mental health illness" OR "mental disorder" OR

"mental illness" OR "psychiatric disorder" OR "psychiatric illness" OR "psychological

disorder" OR "psychological illness" OR "DSM-IV" OR "DSM-5" OR "ICD-10" OR "ICD-

11")

4. Journal of Positive Psychology

Search Terms:(("Mobile*" OR "Web" OR "Web-based" OR "Internet*" OR "Online*" OR

POSITIVE PSYCHOLOGICAL INTERNET- & MOBILE-BASED INTERVENTIONS

"Digital" OR "App" OR "App-based" OR "Self-Help" OR "mHealth" OR "eHealth")) AND

("mental health disorder" OR "mental health illness" OR "mental disorder" OR "mental

illness" OR "psychiatric disorder" OR "psychiatric illness" OR "psychological disorder" OR

"psychological illness" OR "DSM-IV" OR "DSM-5" OR "ICD-10" OR "ICD-11")

5. Google Scholar Search String

("positive psychology intervention" OR "positive affect" OR "gratitude" OR "hope" OR

"resilience" OR "self-compassion") AND ("digital" OR "online" OR "mobile" OR "web-

based" OR "self-help") AND ("mental disorder" OR "psychiatric" OR "DSM-5") AND

("clinical population" OR "depression" OR "anxiety")

These search strategies were adapted to suit the syntax and functionalities of each database

while preserving conceptual consistency across platforms.