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QUATEMAR: a guided mental health app with tele-coaching to bridge the waiting time for starting outpatient psychotherapy - Study protocol for a three-arm randomized controlled trial

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Study protocol

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Abstract

Background

Although 75% of German patients attending a psychotherapeutic consultation are deemed in need of psychotherapy, approximately 50% face waiting times of 5 months on average, increasing the risk for mental health deterioration and deterrence from further help-seeking. A promising approach to bridge this gap lies in guided apps that assist in searching for a psychotherapist and provide psychological competencies during the waiting period. This study evaluates whether an app-based intervention with tele-coaching by licensed psychotherapists reduces the psychopathological symptom severity compared with a control group.

Methods

In a three-arm randomized controlled trial, 360 participants will be randomized 1:1:1 to an app with 6 or 12 weekly tele-coaching sessions, or a psychoeducational control website. Inclusion criteria encompass adults with access to an app-enabled device who had received an indication for outpatient psychotherapy with a waiting period longer than 4 weeks. Exclusion criteria comprise acute danger of self-harm or harm to others, acute psychotic symptoms, and linguistic or neurocognitive barriers. Data will be collected at baseline, 12 and 24 weeks through telephone interviews, and online questionnaires. The primary outcome, psychopathological symptom severity, will be assessed via interview via the AMDP system.

Discussion

The results of this study will contribute to the evaluation of guided digital healthcare before the start of outpatient psychological treatment. If the guided app-based intervention is found to be (cost-)effective, it could significantly contribute to bridging the healthcare gap for individuals waiting for outpatient psychotherapy and serve as an integrated support program in routine care.

Trial Registration

The trial protocol is prospectively registered with DRKS under protocol registration number DRKS00033588. Date of registration: September 25, 2024. Recruitment is ongoing.

1. Background

Despite the availability of evidence-based psychotherapeutic treatments, the demand for outpatient psychotherapy considerably exceeds treatment capacities worldwide. Waiting times for outpatient and community-based mental health services range broadly from approximately two months to up to one year (2 months in the United States; 4–12 months in Australia; 7.5 months in Hong Kong). In Germany, patients wait nearly 5 months from an initial consultation to the beginning of psychotherapy on average, with approximately 40% waiting 6 months, and 11% initiating psychotherapy only about one year later (4).

Delays in accessing treatment may lead to symptom deterioration and risk of chronification (2, 4–6). Prolonged waiting times may further undermine help-seeking, as cancellations are often experienced as rejection, and shame, fear of self-disclosure, and concerns about social stigma pose additional barriers (7, 8). Patients might discontinue help-seeking or contact alternative providers, placing additional strain on the healthcare system (8), creating a vicious cycle of worsening symptoms and increased costs.

Meanwhile, more than three-quarters of patients awaiting psychotherapy express interest in digital support (2), highlighting one possibility of interrupting this cycle. Meta-analyses have demonstrated that standalone app-based interventions can significantly reduce symptoms of depression, anxiety, and insomnia, with guided interventions tending to be even more effective (9, 10). While newer RCTs suggest meaningful symptom reductions among patients seeking outpatient treatment (11, 12), systematic reviews indicate mixed outcomes and limited superiority over inactive controls among patients on waiting lists (6, 13). Digital interventions may also improve help-seeking attitudes and intentions, although evidence for effects on actual help-seeking behavior remains limited (14, 15). Taken together, evidence for guided apps that target both clinical outcomes and waiting times remains limited.

To address this gap, we developed QUATEMAR, an app-based intervention with weekly tele-coaching available immediately after psychotherapeutic consultation, offered in either a 6- or 12-session format. The intervention pursues two objectives: (1) supporting patients in searching for outpatient psychotherapy, and (2) bridging the waiting period by strengthening their psychological competencies. We hypothesize that both intervention groups will show greater reductions in psychopathological symptom severity than a psychoeducational control website, which was chosen to reflect currently available information on the internet. We hypothesize that the intensive format will outperform the standard format.

2. Methods

2.1 Study design

This study will be conducted as a three-arm, prospective, monocentric, assessor-blinded, parallel-group superiority RCT. Two intervention groups (QUATEMAR-standard and QUATEMAR-intensive) will be compared to a psychoeducational website control group. The primary outcome will be psychopathological symptom severity assessed via interview at 24 weeks post-assessment. Secondary outcomes will comprise the waiting time until the beginning of psychotherapy, psychopathological symptom severity assessed via questionnaire, psychosocial functioning, quality of life, healthcare costs, and the severity of depressive and anxiety disorders. Assessments will take place at baseline (before randomization, T1), at mid- (12 weeks after randomization, T2), and post-assessment (24 weeks after randomization, T3) as clinical diagnostic telephone interviews and online questionnaires.

The study is registered in the German Clinical Trials Register (Deutsches Register für Klinische Studien, DRKS; registration no. DRKS00033588, date of registration: 25.09.2024), approved by the ethics committee of the Friedrich-Alexander-Universität Erlangen-Nürnberg (24-28-S, 09.07.2024) and conducted in accordance with the Declaration of Helsinki. Approval of the data plan was received by the data protection department of the Friedrich-Alexander-Universität Erlangen-Nürnberg and the Center for Clinical Studies, University Hospital Erlangen. Reporting is in accordance with SPIRIT (16) and CONSORT (17). An additional file presents the SPIRIT checklist [see Additional file 1].

2.2 Participants

Inclusion criteria for study participation are adults (age ≥18 years) for whom (a) a licensed psychotherapist indicated the need for outpatient guideline-based psychotherapy during a psychotherapeutic consultation on a PTV 11 form (i.e., individual information about the psychotherapeutic consultation patients receive at the end of their consultation), and (b) there is a risk that outpatient treatment might not start in a timely manner (i.e., ≥4 weeks waiting time). Individuals have (c) a valid email address, (d) access to an app-enabled device (Android operating system version ≥7 with an installed Google Play Store or iOS version ≥15), (e) statutory health insurance, and (f) given consent to study participation in the app.

Exclusion criteria for study participation consist of (g) acute risk of self-harm, or (h) harm to others, (i) acute psychotic symptoms, (j) language, or (k) neurocognitive barriers, (l) current psychotherapeutic treatment, or (m) imminent psychotherapy (<4 weeks).

2.3 Power calculation

Based on findings by Taylor (18), weighted for presumed disorder prevalence and conservatively adjusted for a potential effect of the control group, an effect size of d=0.4 is assumed. According to G*Power, a statistical power of 80% with equal group sizes, and α=5%, a sample size of n=100 per group is required. With the planned 1:1:1 allocation, this results in a total sample size of N=300. To compensate for an anticipated dropout rate of 15%, a total of 352 individuals should be enrolled in the study. To optimize cell allocations for multiple median-split comparisons for the planned subgroup analyses, this number was adjusted to N=360 (n=120 per group).

2.4 Procedures

2.4.1 Recruitment

Study recruitment started in November 2024. Interested individuals will receive information about the study primarily through participating psychotherapists after having an initial face-to-face psychotherapeutic consultation. At the end of the consultation, psychotherapists will provide brief information about the study aim, the PTV 11 form with the (suspected) diagnosis/diagnoses, the indication for outpatient psychotherapy and the QUATEMAR program, together with a flyer with a link and QR code to the registration website.

Furthermore, participants and psychotherapists will be recruited via email, academic and clinical institutions in Germany (i.e., university departments, psychotherapy networks, psychotherapy training institutes), healthcare providers (i.e., general practitioners, psychiatrists, neurologists, occupational physicians, outpatient clinics, appointment service centers), health insurance companies, counseling centers, patient and professional associations, and cooperation partners. Health insurance companies will inform eligible insured individuals through a case management program targeting patients who have undergone a psychotherapeutic consultation but have not yet started outpatient psychotherapy. Additional recruitment channels will comprise congresses, online platforms, institutional websites, journals, press offices, social media channels, online forums, notice boards of crisis services, and the distribution of study flyers. Alternatively, individuals who

became aware of the study may schedule a psychotherapeutic consultation and inform the psychotherapist about their interest in study participation.

2.4.2 Onboarding

Onboarding will take place completely remotely via a registration website in approximately 20 minutes. Interested individuals will be asked to watch an informational video on the study purpose and procedures and review the study and health insurance information, as well as the informed consent declarations for participation and data processing.

Next, individuals will enter demographic data and upload the PTV 11 form. Participants are not anonymous and register using their real names. Strict data protection procedures were implemented to ensure confidentiality. The PTV 11 form will be reviewed by study staff to determine eligibility. If the initial criteria are met, study staff will reach out to individuals via telephone or email to provide an overview of the study process. Individuals will then be able to download the QUATEMAR app for free (via two-factor authentication by email and SMS), and will give informed consent for study participation and data processing in the app. After that, individuals receive the baseline questionnaire (with 5 reminders within 2 weeks), after which they will be able to schedule a diagnostic telephone interview to assess the primary outcome and further screen inclusion and exclusion criteria.

Once all eligibility requirements have been confirmed, study staff will carry out randomization on the same day or the next working day. For participants assigned to the intervention groups, the app will be fully activated, and an initial tele-coaching session will be scheduled with the first appointment sent via SMS. Participants in the control group will receive access to the website via SMS. Participants are able to contact the study staff at any time via email or telephone throughout the study. They will receive up to 100€ for study participation, depending on their participation in the interviews.

2.4.3 Randomization and blinding

Eligible participants will be randomly allocated in a 1:1:1 ratio to QUATEMAR-standard (app + 6 tele-coachings), QUATEMAR-intensive (app + 12 tele-coachings), or QUATEMAR-website (website). The randomization will be conducted via computer-generated random numbers as block randomization with a random block length implemented on the management website. The study staff conducting the randomization will not know in advance which group will be assigned to participants. Participants are not blind regarding group assignment. Interviewers are blind to participant study allocation. To maintain blinding, participants are instructed not to disclose their group assignment and are verbally reminded of this before each assessment. If blinding is broken during the assessment, a different assessor will conduct the following interview(s), and this will be documented accordingly. An overview of the study flow is presented in Figure 1.

2.4.4 Intervention

The interventions consist of the QUATEMAR app with weekly tele-coaching sessions and access to routine care. The difference between QUATEMAR-standard and QUATEMAR-intensive is the number of tele-coaching sessions (6 sessions in 6 weeks in QUATEMAR-standard vs. 12 sessions in 12 weeks in QUATEMAR-intensive); the app is identical for both groups and can be accessed for 9 months (270 days after randomization). The intervention phase begins after randomization. Participation in the intervention (app + tele-coaching) ends upon the start of outpatient guideline-based psychotherapy (after successful probatory sessions) or (day) inpatient psychotherapeutic, psychosomatic, or psychiatric treatment.

The intervention was developed in two phases (concept development phase and iterative development phase) in an expert driven manner by clinicians, app developers, scientists, usability experts, and designers. In the concept development phase, the intervention concept was refined with feedback from five focus groups (with a total of 45 participants from health insurance companies, professional associations of service providers, and patients) and surveys of patients (n=30) and psychotherapists (n=10). Tele-coaching was tested in a feasibility study (n=8; pre-post symptom reduction d=0.54), and the digital components and processes were specified on this basis. Results revealed that the waiting time for outpatient psychotherapy was a significant burden for many patients and led to a deterioration in their health status in some cases. In the iterative development phase, three focus groups, consisting of psychology students (n=3), researchers (n=5), and people awaiting psychotherapy (n=2), were conducted to gather insights into the app's usability, obstacles, and possible improvements. Key themes included the importance of motivation and encouragement by the tele-coaches, personalization, and the removal of psychological and technical barriers, which were incorporated into the intervention and the study procedures.

The finalized intervention consists of 1) the QUATEMAR app, 2) the tele-coaching, and 3) a coaching manual for tele-coaches.

2.4.4.1 QUATEMAR app content

Both intervention groups will gain access to the same QUATEMAR app for 9 months.

The app is based on evidence-based approaches and incorporates techniques from cognitive behavioral therapy (CBT), relaxation, behavioral activation, cognitive restructuring, and cognitive bias modification (19). The app comprises five components: a *lesson component*, an *emergency area component*, a *support services component*, a *motivation component*, and a *chat component*.

The *lesson component* is designed to facilitate the acquisition and practice of skills through multimodal content, including text, images, video, and audio, combined with interactive tasks such as text entries, pictures, or voice message uploads. An overview of mandatory and optional lessons and their content is presented in Table 1. Certain tasks comprise an Approach-Avoidance Bias Modification paradigm (19) in which self-critical attitudes are pushed away and self-efficacious attitudes are pulled towards the users via screen swiping. This paradigm is used for self-reward and reflection at the end of some lesson components.

The *support services component* provides users with information on health services (see Table 2). After identification of an adequate service during the tele-coaching, the coach or the user may provide contact information (e.g., phone number, address, directions). Users are able to complete a checklist that provides low-threshold steps for accessing health services. The tele-coach can review checklist entries, enabling them to monitor and facilitate the uptake process.

In case of symptom deterioration, users are advised to use the *emergency area component,* which outlines prespecified coping strategies. The component contains nationwide emergency numbers, allows users to add personal support contacts, and permits direct calling from within the app.

The *motivation component* allows users to record their personal reasons for seeking psychotherapy. Users can choose to upload photos, enter text or record audio and may change the components' content at any time. A new motivation component is inserted if the user does not use the app for a specific time period.

The *chat component* supports asynchronous communication between users and coaches to reschedule tele-coaching sessions. Although messages are displayed immediately, the component is not intended to serve as an acute support system.

The training of skills via the *lesson component* is recommended three times a week, with each session lasting approximately 15 to 20 minutes. To foster adherence, users can specify their preferred training times and receive push notifications as reminders.

With ongoing app usage, an adaptive algorithm adjusts the sequence of lessons according to individual needs, usage patterns, motivation, and deficits. Consequently, the original sequence of lessons may be modified throughout use via user input and queries. Additionally, when deemed necessary, the tele-coach is able to insert lessons, thereby overwriting the current lesson.

Table 1 *Lessons, skills, and content of the app*

Lessons	Skill and content	Mandatory/ optional
Boosting motivation	Boosting motivation to engage with the app, becoming aware of one's main reason for healing, learning how to positively reinforce oneself	mandatory
Emergency area	Emergency plan, common emergency numbers, personal telephone numbers for social support	mandatory
Finding a psychotherapist	Education on the prevalence of mental disorders, information on where to search for psychotherapists and how to get in contact, alternatives if no therapy is available, self-support in case of failures	mandatory
Relaxation	Vicious circle of physical and psychological tension, progressive muscle relaxation, imagination, autogenic training, body scan	mandatory
Indicator	Identifying the most important next optional lessons and determining their sequence	mandatory
Solving problems	Healthy attitude toward problems, resource training, problem-solving model, accepting unsolvable problems	optional
Dealing well with emotions	Recognizing specific emotions, understanding emotions and their functions, accepting distressing emotions, relying on one's resilience, modifying emotions, positive activities, reality check, positive body perceptions, self-reinforcement	optional
Stabilizing self-esteem	Knowing one's strengths and evoking pride, self-reparenting, self-affirmation, positive activities	optional
Dealing well with depressive mood	Recognizing depressive symptoms, psychoeducation, models on the onset of depression, positive activities and behavioral activation, depression-evoking cognitions and reality check, ABC-model, positive perspective	optional
Coping with anxiety	Psychoeducation on cognitive appraisal theories, impact of avoidance, fear of anxiety, psychoeducation on anxiety-related disorders, cognitive coping strategies aiming at reappraisal of body symptoms, reality checks, decatastrophizing, exposure therapy, boosting motivation for exposure and defining plans	optional
Coping with addiction	Identifying addiction, understanding the underlying behavioral and biological mechanisms, identifying the function of addiction, ways into and out of addiction, weighing pros and cons of change, relapse model by Marlatt & Gordon (20), stairs of relapse, maintaining balance through self-care, recognizing and avoiding risk situations, dealing with social pressure, emotions, craving, relapse and high-risk cognitions	optional
Coping with problematic eating	Recognizing symptoms and forms of problematic eating behavior, psychoeducation, understanding causes, accepting one's body, practicing body positivity, understanding the impact of critical media, establishing eating routines, meal plans, value every success, strengthening self-esteem, behavioral skills	optional
Sleeping better	Identifying risk factors, breaking the vicious cycle with acceptance, dealing with little sleep, sleep hygiene, creating a time slot dedicated to relaxation right before sleeping, relaxing imaginations	optional

Table 2 *Support services in the app*

Support service	Research system	Contents of Q&A
Outpatient therapy	Psychotherapists and psychiatrists via link to website of 116 117 for medical help, (training) institutes for psychotherapy, university outpatient departments	Education on outpatient therapy and practitioners, guideline psychotherapy and potential side effects
Counseling	Link to the website of the German Depression Aid Association (21) and Caritas (22) with an overview of counseling and support services	Education on the benefit of counseling centers
Clinic	Psychiatric, day and rehabilitation clinics	Estimating when a clinic is needed, education on terms for various kinds of clinics
Self-help groups	Link to the website of NAKOS (23) with a research system for self-help groups	Education on self-help groups and what to expect
In every tab		Education on how to find a psychotherapist and getting in contact, making use of waiting times, training competencies in the app, getting help in crises

2.4.4.2 Guidance: Tele-Coaching

In QUATEMAR-intensive, participants receive up to 12 tele-coaching sessions over 12 weeks; in QUATEMAR-standard, participants receive up to 6 sessions over 6 weeks, both starting from randomization. Tele-coaching sessions are typically scheduled weekly, consisting of a 25-minute telephone call, and are followed by a 5-minute documentation by the coach. If a participant cancels two sessions, tele-coaching is temporarily suspended, and the participant is asked whether they wish to continue. If they do, coaching may resume; if not, tele-coaching is discontinued permanently.

The tele-coaching sessions follow patient-centered, adaptive guidelines via a structured coaching manual and are conducted by licensed psychotherapists from mentalis GmbH. The primary focus is to support participants in seeking outpatient psychotherapy, which should always be addressed at the beginning of each session. Participants work with the tele-coach to clarify their needs, explore treatment options, reduce shame and foster remoralization, strengthen their motivation, validate the participants' concerns, plan and implement their search, and evaluate their progress consistently. A central aspect of tele-coaching is the therapeutic relationship, guided by Rogerian principles (24) such as empathy, relationship-building, bonding, and a resource-oriented approach. When needed, sessions may also address psychoeducation, emotion regulation competencies, strengthening problem-solving skills, and disorder-specific coping strategies. The tele-coaching does not replace psychotherapy, does not involve diagnosis, and respects the participant's wish not to discuss certain topics. Each session should be concluded with a jointly agreed-upon task for the participant. Flexibility in applying the manual must be maintained, and tele-coaches are encouraged to adapt the coaching process as needed. Tele-coaching is complemented by motivation-enhancing components in the QUATEMAR app, which the tele-coaches can tailor to the topics addressed in the tele-coaching sessions. Coaches ensure that participants meeting exclusion criteria after study inclusion due to contraindications (i.e., acute suicidality) are referred to appropriate services and no longer receive tele-coaching or app access.

2.4.5 Control group: QUATEMAR-website

The control group has access to routine care and receives a link to a website, which is sent to participants via text messages after randomization, and is accessible throughout the entire study period.

The website provides psychoeducational information on approaches to searching for a psychotherapist and presents ideas on how to effectively utilize waiting times. The website contains several tabs: a homepage, a tab about the probatory sessions with psychotherapists, reimbursement procedures, how to find a psychotherapist, the difference between medical professions (psychotherapists with a psychology vs. medicine background vs. naturopaths), outpatient guideline-based psychotherapy, side effects of psychotherapy, tips for searching for a psychotherapist, how to use waiting time, and help in acute crisis. This information is currently available on various stakeholders' websites as well but often goes unnoticed by patients (as per surveys from the concept development phase). This control group was chosen because it represents a potentially quickly implemented optimization of routine care at minimal cost.

2.5 Outcomes and assessments

Outcomes will be assessed at baseline (T1), after 12 weeks (T2), and 24 weeks (T3) after randomization. After the end of the study (T4), participants, tele-coaches, and psychotherapists will be invited to an online questionnaire to provide feedback on their experiences and satisfaction with the intervention, as well as opportunities for optimization, facilitators, and barriers to uptake.

Evaluation interviews will be carried out via telephone by trained interviewers with at least a bachelor's degree in psychology. They receive instruction on interview techniques, guideline adherence, and the management of suicidality during the interview process, and practice ratings using previous interviews after which they receive detailed feedback from an experienced interviewer. To ensure evaluation quality, a subset of the evaluation interviews will be recorded, independently rated by a second rater, and tested for sufficient inter-rater reliability.

Further outcomes will be assessed via online questionnaires in LimeSurvey and the QUATEMAR app. Participants will receive reminders about their upcoming assessments. Primary, secondary and tertiary outcomes, their instruments, and time points are presented in Table 3.

Table 3 Outcomes, Instruments, and Assessment Time Points

Outcome Domain	Instrument	T1 (BL)	We	T2 (+12w)	T3 (+24w)	T4
Demographic Data						
Demographic Data	CSSRI	X				
Diagnostic Status	(Suspected) diagnosis/diagnoses in PTV 11 form; SCID-5-SPQ	X				
Experiences with e-Health Offers	Self-developed questionnaire	X				
Primary Outcome						
Psychopathological Symptom Severity	AMDP® System	X		X	X	
Secondary Outcomes						
Waiting Time for Beginning Psychotherapy	CSSRI; statutory health insurance routine data, self-developed questionnaire	X		X	X	
Psychopathological Symptom Severity	Mini-SCL	X		X	X	
Psychosocial Functioning	SFQ	X		X	X	
Quality of Life	SF-12 (self-rating)	X		X	X	
Healthcare Costs	CSSRI; statutory health insurance routine data	X		X	X	
Severity of Depressive Disorder	HAMD	X		X	X	
Severity of Anxiety Disorder	HAMA	X		X	X	
Tertiary Outcomes						
Healthcare Service Density	Regional distribution of healthcare providers	X				
Income	CSSRI	X				
Educational Level	CSSRI	X				
Migration Background	Self-developed questionnaire	X				
Social Assertiveness	RAS	X				
Problem-solving Skills	ASKU	X		X	X	
Emotion Regulation Skills	SEK-27	X		X	X	
Process Evaluation						
Participants						
Search Engagement	Self-developed questionnaire	X		X	X	
Search Competence	Self-developed questionnaire	X		X	X	
Flexibility Regarding Acceptance of Available Offers	Self-developed questionnaire	X		X	X	
Barriers, Facilitators, and Optimization of the Intervention	Self-developed questionnaire					X
Satisfaction	UEQ-S; SUTAQ			X		
Negative Effects	NEQ			X		
Tele-coaches						

Outcome Domain	Instrument	T1 (BL)	We	T2 (+12w)	T3 (+24w)	T4
Search Engagement	Self-developed questionnaire					X
Search Competence	Self-developed questionnaire					X
Flexibility Regarding Acceptance of Available Offers	Self-developed questionnaire					X
Barriers, Facilitators, and Optimization of the Intervention	Self-developed questionnaire					X
Satisfaction	UEQ-S; SUTAQ					X
Psychotherapists						
Search Engagement	Self-developed questionnaire					X
Search Competence	Self-developed questionnaire					X
Flexibility Regarding Acceptance of Available Offers	Self-developed questionnaire					X
Barriers, Facilitators, and Optimization of the Intervention	Self-developed questionnaire					X
Psychotherapist Experience	Self-developed questionnaire					X
Satisfaction	UEQ-S; USE					X
App and tele-coaching data						
Psychopathological Symptom Severity	PHQ-4		X			
Health Services Assessment	Single-Item-VAS		X			
Problem-solving Competence	Single-Item-VAS		X			
Emotion Regulation Competence	Single-Item-VAS		X			
Relaxation Competence	Single-Item-VAS		X			
Therapeutic alliance	WAI-O	X		X		

Note. AMDP = Association for Methodology and Documentation in Psychiatry. ASKU = General Self-Efficacy Short Scale (Allgemeine Selbstwirksamkeit Kurzskala). BL = baseline. CSSRI = Client Sociodemographic and Service Receipt Inventory. HAMA = Hamilton Anxiety Rating Scale. HAMD = Hamilton Depression Rating Scale. Mini-SCL = Mini Symptom Checklist. NEQ = Negative Effects Questionnaire. PHQ-4 = Patient Health Questionnaire-4. PTV 11 = Individual information about the psychotherapeutic consultation patients receive at the end of their consultation. RAS = Rathus Assertiveness Schedule. SEK-27 = Self-Assessment of Emotional Competencies–27. SF-12 = 12-Item Short Form Health Survey. SFQ = Social Functioning Questionnaire. SCID-5-SPQ = Structured Clinical Interview for DSM-5 Screening Personality Questionnaire. SUTAQ = Service User Technology Acceptability Questionnaire. T1 = baseline. T2 = 12 weeks mid-assessment. T3 = 24 weeks post-assessment. T4 = follow-up assessment. UEQ-S = User Experience Questionnaire Short. USE = Usefulness scale for patient information material. VAS = Visual Analogue Scale. WAI-O = Working Alliance Inventory Observer Form. We = weekly assessment (intervention groups only).

[1]Weekly recording takes place exclusively in the two intervention groups during the intervention period via the QUATEMAR app. Its purpose is to inform tele-psychologists about utilization behavior and progress in gaining competencies.

2.6 Demographic data

Sociodemographic variables (e.g., gender and age), (suspected) diagnosis/diagnoses and indication(s) documented in the PTV 11 form, personality disorder symptoms assessed via the SCID-5-SPQ , and prior experience with eHealth services are collected to characterize the study sample.

2.7 Primary outcome

The primary outcome of the RCT is psychopathological symptom severity assessed via the AMDP® System in a two-hour interview format (26,27), comparing QUATEMAR-intensive to the control group at 24 weeks post-assessment. The AMDP® System includes instruments for the standardized assessment of psychopathological and somatic characteristics and anamnesis data in patients with mental disorders.

Table 4 AMDP characteristics

Psychopathological Characteristics	Somatic Characteristics
Disorders of Consciousness	Disturbances of Sleep and Vigilance
Disturbances of Orientation	Appetitive Disturbances
Disturbances of Attention and Memory	Gastrointestinal Disturbances
Formal Thought Disorders	Cardiac-Respiratory Disturbances
Worries and Compulsions	Other Autonomic Disturbances
Delusions	Other Somatic Disturbances
Disorders of Perception	Neurological Disturbances
Ego (Boundary) Disturbances	Additional Somatic Items
Disturbances of Affect	
Disorders of Drive and Psychomotor Activity	
Circadian Disturbances	
Other Disturbances	
Additional Psychopathological Items	

A total of 140 AMDP items consist of 21 AMDP characteristics (see Table 4). Each item of the AMDP is rated on a 5-point scale: not present (0), mild (1), moderate (2), severe (3), or not applicable (0). Items are rated during the last 4 weeks. Data sources can stem from patient ratings, interviewer ratings, or both. For each participant, a total sum score of psychopathological symptom severity is calculated over all items at each of the three assessments. Higher total scores indicate greater overall symptom severity. Additionally, sum scores will be given for the 9 primary syndrome scales (paranoid-hallucinatory, depressive, psycho-organic, manic, hostility, autonomic, apathy, obsessive-compulsive, and neurological syndrome) and three superordinate syndrome scales (paranoid-hallucinatory symptoms, depressive symptoms, psycho-organic symptoms).

The AMDP® System has shown good interrater reliability (r_{tt}=0.75; (28)) and has been validated in various clinical settings (29). According to the AMDP manual, the system has undergone several revisions over time to improve its reliability and validity.

2.8 Secondary outcomes

2.8.1 Waiting time for beginning psychotherapy

Waiting time until beginning outpatient psychotherapy is assessed via an adapted version of the Client Sociodemographic and Service Receipt Inventory (CSSRI; (30); German). The CSSRI collects information on sociodemographic characteristics, employment status, and utilization of healthcare services. Participants indicate the number of treatment sessions they had attended in the past 3 months. Additionally, participants report the number of weeks spent searching for a psychotherapy appointment and the number of appointments attended with a psychotherapist, both of which were assessed via self-developed questionnaires. Statutory health insurance routine data will be included if applicable.

2.8.2 Psychopathological symptom severity

Psychological symptom severity is assessed using the Mini-Symptom Checklist (Mini-SCL; (31); German; 18 items; α≥.90). Items refer to the past seven days and are rated on a 5-point Likert scale ranging from 0 (not at all) to 4 (extremely). The Global Severity Index (GSI) is

calculated as the mean score across all items, with higher mean scores indicating greater psychological distress.

2.8.3 Psychosocial functioning

Psychosocial functioning is measured using the Social Functioning Questionnaire (SFQ; (32); German-translated; 8 items; α>.80). Items refer to the past two weeks and are rated on a 4-point Likert scale from 0 to 3. Total scores range from 0 to 24, with higher scores indicating greater psychosocial impairment.

2.8.4 Quality of life

Health-related quality of life is assessed with the Short Form Health Survey (SF-12; (33); German; 12 items; α>.80). Items refer to the current health status or to the last week. The instrument yields two composite scores: the Physical Component Summary (PCS) and the Mental Component Summary (MCS). Items cover multiple health domains, including physical functioning, limitations due to physical health and emotional problems, bodily pain, general health perceptions, vitality, social functioning, and mental health. Scores are standardized (mean=50, SD=10), and higher scores reflect better health status.

2.8.5 Healthcare costs

Health service utilization and associated costs (in Euro) during the 3 months preceding each assessment are measured using an adapted version of the CSSRI (30). Cost estimates are derived from reported service use and standardized unit costs. Costs associated with absenteeism, defined as days not worked, were estimated using the human capital approach (34). The number of workdays lost due to absenteeism was valued based on participants' average gross daily income. Costs related to presenteeism were assessed using the Osterhaus method, which focuses on an individual's work capacity. Within this approach, productivity loss costs were estimated by multiplying the number of workdays with reported reduced performance by an inefficiency score assigned to those days (35). Statutory health insurance routine data will be included if applicable.

2.8.6 Severity of depressive disorder

Clinician-rated severity of depressive symptoms is assessed using the Hamilton Depression Rating Scale (HAM-D; (36); German; 17 items; α≈.73-.88). Items refer to the past four weeks. The HAM-D is a structured interview covering core domains of depression, including depressed mood, guilt, suicidality, sleep disturbances, impairments at work, depressive inhibition, agitation, psychological anxiety, somatic anxiety, physical symptoms, genital symptoms, hypochondria, weight changes, and daily fluctuations. Items are rated on either 3- or 5-point scales, yielding total scores ranging from 0 to 52. Higher total scores indicate greater severity of depressive symptomatology.

2.8.7 Severity of anxiety disorder

Clinician-rated severity of anxiety symptoms is assessed using the Hamilton Anxiety Rating Scale (HAM-A; (37); German; 14 items; α≈.83-.87). Items refer to the past four weeks. The HAM-A is a structured interview assessing psychic and somatic anxiety symptoms, including anxious mood, tension, fear, insomnia, cognitive impairment, depressive mood, and somatic symptoms. Items are rated on a 5-point scale from 0 (not present) to 4 (very severe), resulting in total scores ranging from 0 to 56. Higher total scores reflect greater severity of anxious symptomatology.

2.9 Tertiary outcomes

2.9.1 Healthcare service density

The therapeutic region is categorized based on regional medical and psychological psychotherapist density using data from the regional distribution of healthcare providers in the statutory health insurance system [Regionale Verteilung der Ärzte in der vertragsärztlichen Versorgung] provided by the German National Association of Statutory Health Insurance Physicians (38). Regions are classified according to the number of psychotherapists per 100,000 inhabitants at the district level [Kreisebene], allowing for differentiation between well-served and underserved areas.

2.9.2 Income

Income is measured via a CSSRI item as participants' gross monthly income from occupational activity before tax and social security deductions, excluding child benefits, social benefits, pensions, rental income, student grants, etc. For self-employed individuals, the average monthly income will be reported. Participants without regular income will be instructed to enter no income.

2.9.3 Educational level

Education level is assessed via a CSSRI item by asking participants to indicate their highest completed qualification. Response options will be as follows: still in education/no formal qualification, lower secondary education, intermediate secondary education, upper secondary education, general higher education entrance qualification, university of applied sciences degree, and university degree.

2.9.4 Migration background

Migration background is captured through a multi-option question based on Maehler (39). Participants indicate whether they or one or both parents were born outside Germany or immigrated after 1949, or whether they do not hold German citizenship. At least one affirmative response qualifies as having a migration background.

2.9.5 Social assertiveness

Social assertiveness is measured using the Rathus Assertiveness Schedule (RAS; (40); German-translated; 30 items; α≈.82). The schedule is rated on a 6-point Likert scale from -3 (very uncharacteristic of me, extremely nondescriptive) to +3 (very characteristic of me, extremely descriptive), with total scores ranging from –90 to +90. Lower scores indicate greater assertiveness.

2.9.6 Emotion regulation skills

Emotion regulation skills are measured using the Self-Assessment of Emotional Competencies (SEK-27; (41); German; 27 items; α=.90). Items refer to the last week. The SEK-27 assesses nine competencies in adaptive emotion regulation, including attention, clarity, body awareness, understanding, acceptance, resilience, self-support, confrontation, and regulation. Items are rated on a 5-point Likert scale from 0 (not at all) to 4 ((almost) always), with higher total scores indicating greater emotion regulation competence.

2.9.7 Problem-solving skills

Problem-solving skills are measured using the German General Self-Efficacy Short Scale (Allgemeine Selbstwirksamkeit Kurzskala) (ASKU; (42); German; 3 items; ω≈.80–.86). The scale assesses individual competence expectations to be able to deal with difficulties and obstacles in daily life. Items are rated on a 5-point Likert scale from 1 (does not apply at all) to 5 (fully applies), with higher mean scores indicating greater problem-solving competence.

2.9.8 Process evaluation

A process evaluation will be conducted as tertiary outcomes to examine how and under which contextual conditions the intervention exerts its effects. Specifically, it aims to (1) clarify potential contextual factors and moderators, (2) examine factors relevant to recruitment, fidelity, the administered dose, and mechanisms, and (3) identify relevant outreach variables and effects of the received dose. The related hypotheses are based on the QUATEMAR process model shown in Figure 2.

Participants, psychotherapists, and tele-coaches will complete online questionnaires, where they will assess search engagement, search competence, and flexibility regarding the acceptance of available treatment offers, and indicate perceived barriers, facilitators, and suggestions for optimization of the intervention. Additionally, participants and tele-coaches will rate their satisfaction with the intervention using the short version of the User Experience Questionnaire (UEQ-S; (43); German; 14 items; α=0.81-.85) and the Service User Technology Acceptability Questionnaire (SUTAQ; (44); German; 22 items; α=0.64-89). Psychotherapists will report on their experiences with suggesting the intervention in their psychotherapeutic consultation as well as rate their satisfaction with the information material given using the UEQ-S and the Usefulness scale for patient information material (USE; (45); German; 9 items; α=0.84-94).

Additionally, negative effects of the intervention are assessed by the Negative Effects Questionnaire (NEQ; (46); German; 20 items; α=0.95). The occurrence of negative effects (item range: 0 [not experienced] to 1 [experienced]; sum score range: 0 to 20) and negative impact (item range: 0 [not at all] to 4 [extremely]; mean score range: 0 to 4) are measured in relation to the treatment or other circumstances. Higher sum scores indicate more negative effects; higher mean scores indicate more negative impact.

2.10 App and tele-coaching data

Within the app, participants complete brief weekly assessments for 12 weeks to monitor symptom burden and perceived competencies. These include the Patient Health Questionnaire-4 (PHQ-4; (47); German; 4 items; α=0.78) to assess symptoms of depression and anxiety, as well as single-item visual analog scales (VAS) measuring health service utilization as well as emotion regulation, problem-solving, and relaxation competence. The measurements will be subjected to exploratory analysis to determine their predictive value for long-term effects.

The treatment quality of the tele-coaching sessions will be evaluated using an adherence rating. A random sample of 5% of audio-recorded sessions will be reviewed by a trained rater to assess guideline adherence, including whether the primary focus was on facilitating access to outpatient psychotherapy. The therapeutic alliance between participant and tele-coach will be measured using the Working Alliance Inventory – Observer Form (WAI-O; (48); German-translated; 36 items; 7-point Likert scale from 1 [very strong evidence against] to 7 [very strong evidence]; sum score range for Task, Goal, and Bond: 12 to 84; α≈.89). In cases of significant deviations, additional training of tele-coaches will be implemented.

2.11 Exploratory assessment

To capture mid-term effects, an exploratory assessment will be carried out to evaluate the changes between baseline (T1) and the post-assessment 12 weeks after the intervention's initiation (T2).

2.12 Data management

Data will be collected and entered electronically via the management website, LimeSurvey, Unipark, and the QUATEMAR app. To minimize data entry errors, quality control measures including double data entry, and automated range checks will be implemented. Data security is ensured through pseudonymization of participant records, restricted access rights limited to authorized study staff, and storage on password-protected servers in compliance with the German General Data Protection Regulation (GDPR/DSGVO). Data will be retained for a period of 10 years following study completion. Full details of data management procedures are documented in the separate Data Management Plan, available on request.

2.13 Statistical methods

For all statistical analyses, the fulfillment of preconditions will be examined. If these preconditions are not met, suitable alternative methods will be applied. All tests will be performed at a significance level of 5%, and adjustments for alpha error inflation will be made in case of multiple comparisons. For every comparison, we will report p-values along with effect sizes and their corresponding 95% confidence intervals.

2.13.1 Analysis of the primary outcome

The RCT hypothesizes that both QUATEMAR-standard and QUATEMAR-intensive will lead to greater improvements in psychopathological symptom severity compared to control, with QUATEMAR-intensive expected to outperform QUATEMAR-standard at 24 weeks post-assessment. The primary analysis is conducted in the intention-to-treat population (all randomized study participants) in the form of an analysis of covariance (ANCOVA) with the three-level factor of group as the independent variable, psychopathological symptom severity at 24 weeks (T3) as the dependent variable, and psychopathological symptom severity at baseline (T1) as the covariate. Confirmatory testing of the primary research question will follow a hierarchical procedure with hierarchically arranged primary hypotheses (PH1: QUATEMAR-intensive vs. control; PH2: QUATEMAR-standard vs. control), each tested at a two-sided significance level of α=0.05, whereby PH1 will be tested first and PH2 only in the event of rejection of PH1, reflecting the established dose-response relationship in psychotherapeutic interventions (49). PH1 and potentially PH2 will be evaluated in the ANCOVA model by testing the contrasts of the corresponding factor levels. In case of a non-negligible proportion of missing data, multiple imputation using the fully conditional specification method is performed for the analysis of the primary outcome to utilize available information to complement randomly missing values.

2.13.2 Analysis of the secondary outcomes

The RCT hypothesizes that both QUATEMAR-standard and QUATEMAR-intensive will lead to greater improvements in psychopathological symptom severity, psychosocial functioning, quality of life, and the severity of depressive and anxiety disorders, as well as greater reductions in waiting time and healthcare costs compared to control, with QUATEMAR-intensive expected to outperform QUATEMAR-standard at 24 weeks post-assessment. Analysis will be conducted analogously to the analysis of the primary outcome.

2.13.2.1 Health economic evaluation

The RCT will be accompanied by an economic evaluation from a societal and health insurance perspective. Two approaches will be applied: an incremental cost-effectiveness analysis, assessing costs per reliable change index responder via the AMDP, and a cost-utility analysis, estimating costs per quality-adjusted life year (QALY) via the SF-12. The CSSRI, and, if applicable, statutory health insurance routine data, will be used to examine costs. The following cost categories will be included: intervention costs, outpatient and inpatient costs, medication costs, counseling costs, out-of-pocket costs, unpaid help costs, and productivity costs (absenteeism and presenteeism). These costs will

enable the measurement of resource use related to mental health conditions and the recording of healthcare-related consumption. The health insurance perspective will include direct medical costs. The societal perspective will additionally include patient and family costs as well as productivity costs. Costs will be based on standardized unit costs reported by Muntendorf (50). A multi-way sensitivity analysis will be carried out to evaluate the robustness of the most favorable outcomes. The stability of the incremental cost-effectiveness ratio (ICER) will be further examined by applying non-parametric bootstrapping (5,000 iterations). To capture uncertainty surrounding the ICER, bootstrap simulations will be performed, with results displayed on a cost-effectiveness plane. Finally, a cost-effectiveness acceptability curve (CEAC) will be derived to indicate the probability that the interventions (QUATEMAR-intensive or QUATEMAR-standard) are cost-effective compared to control, considering observed data and different monetary thresholds that a decision-maker might be willing to pay for a unit improvement in health outcomes.

2.13.3 Analyses of the tertiary outcomes

Moderation analyses will be conducted using advanced modeling approaches. Potential moderators include healthcare service density, income, educational level, migration background, and social assertiveness. These moderators will be examined in relation to outcomes assessed in the primary and secondary analyses. Moderation effects will be tested across all pairwise comparisons of the three groups by including interaction terms between group and the respective moderator in regression models adjusted for baseline levels of the outcome variable. The conditional specification method will be performed for the analysis of tertiary hypotheses to utilize the available information to complement randomly missing values.

Mediation analyses will be conducted within the process evaluation to explore potential mechanisms of change by examining whether differences between the three groups in process-related variables mediate group differences in patient outcomes. Potential mediators include patients' motivation to search for psychotherapy, search competence, flexibility in accepting available therapy offers, waiting time, problem-solving competence, and emotion regulation competence. These mediators will be tested with respect to outcomes assessed in the primary and secondary analyses. Mediation effects will be examined across all pairwise comparisons of the three treatment groups using regression-based mediation models. Resulting p-values will be adjusted for multiple testing.

2.13.4 Sensitivity analysis

As part of sensitivity analyses, the primary and secondary outcome analyses will be repeated in the per-protocol sample. The per-protocol sample will include participants who adhered sufficiently to the intervention, demonstrating regular coaching and app use during the intervention period, with no major protocol violations identified during quality monitoring and with available primary outcome data at T1 and T3. For participants who discontinue the intervention early due to the beginning of outpatient psychotherapy, adherence will be evaluated relative to the individual duration of participation, and such discontinuation will not be considered a protocol violation.

3. Discussion

This RCT aims to evaluate the effectiveness of QUATEMAR, an app-based intervention with tele-coaching designed to bridge the waiting time between psychotherapeutic consultation and the beginning of outpatient psychotherapy.

To date, there is limited evidence on the effectiveness of app-based interventions targeting individuals who have received a formal indication for outpatient psychotherapy while facing prolonged waiting times before treatment initiation. This finding indicates that there remains potential to improve the effectiveness of these interventions (6, 13). Evidence further suggests that guided interventions outperform unguided interventions, highlighting the importance of human support in enhancing effectiveness (10). Therefore, our RCT will provide new insights into guided digital care.

This RCT has several strengths. First, the primary outcome will be assessed using a structured diagnostic telephone interview based on the AMDP system, providing a standardized, assessor-blinded, dimensional assessment of psychopathological symptom severity. Second, the three-arm randomized controlled design allows hierarchical testing of two guidance intensities against control, investigating how varying levels of human support influence effectiveness. Third, the intervention targets both symptom reduction and treatment navigation to address psychological and structural barriers within the healthcare system. Finally, diagnostic clarification and indication by licensed psychotherapists as a prerequisite for study participation, together with tele-coaching delivered by licensed psychotherapists, ensures high diagnostic and coaching quality.

Furthermore, several limitations should be considered: First, the heterogeneous study population may attenuate disorder-specific effect sizes, though enhancing external validity. Second, the comparison of an app-based intervention with a web-based control group, which controls for digital attention and psychoeducation, does not allow for participant blinding and may therefore introduce expectancy effects. Although a methodologically more stringent app-based control group could have enhanced internal validity (51), the control group was

deliberately chosen to reflect consolidated information commonly available across multiple internet sources. Third, post-assessment is limited to 24 weeks. Longer-term investigations are necessary to determine whether effects persist and reduce chronicity of patients.

From a research perspective, the comparison of guidance intensities provides empirical data relevant to resource allocation: if intensive guidance yields only marginal additional benefit, standard formats may offer a cost-effective solution, or a psychoeducational website may itself be sufficient for some patients. The health economic evaluation will clarify whether QUATEMAR reduces costs associated with the duration of outpatient psychotherapy, chronic illness trajectories, or work incapacity, informing reimbursement policies within German statutory health insurance systems.

Clinically, guided digital bridging interventions may stabilize symptoms, strengthen coping skills, and preserve motivation, while supporting patients in navigating the referral process to increase treatment uptake and relieve psychotherapists from administrative burden. Beyond immediate symptom reduction, QUATEMAR may contribute to a reconceptualization of waiting time as an active phase of early intervention, potentially mitigating chronification and improving continuity of care.

Taken together, this RCT will provide data that may inform future strategies and health policy decisions in Germany and comparable healthcare systems worldwide. If effective, QUATEMAR could represent a sustainable component of routine mental healthcare in systems characterized by limited outpatient psychotherapy capacity.

Abbreviations

AMDP: Association for Methodology and Documentation in Psychiatry (Arbeitsgemeinschaft für Methodik und Dokumentation in der Psychiatrie)

ANCOVA: Analysis of Covariance

ASKU: General Self-Efficacy Short Scale (Allgemeine Selbstwirksamkeit Kurzskala)

CBT: Cognitive Behavioral Therapy

CEAC: Cost-Effectiveness Acceptability Curve

CONSORT: Consolidated Standards of Reporting Trials

CSSRI: Client Sociodemographic and Service Receipt Inventory

DRKS: Deutsches Register für Klinische Studien (German Clinical Trials Register)

DSGVO: Datenschutz-Grundverordnung

GDPR: General Data Protection Regulation

GSI: Global Severity Index

HAM-A: Hamilton Anxiety Rating Scale

HAM-D: Hamilton Depression Rating Scale

ICER: Incremental Cost-Effectiveness Ratio

MCS: Mental Component Summary

Mini-SCL: Mini Symptom Checklist

NEQ: Negative Effects Questionnaire

PCS: Physical Component Summary

PHQ-4: Patient Health Questionnaire-4

PTV 11: Individual information about the psychotherapeutic consultation patients receive at the end of their consultation

QALY: Quality-Adjusted Life Year

QUATEMAR: Qualifizierte Therapieaufnahmeförderung nach Empfehlung einer ambulanten Richtlinienpsychotherapie

RAS: Rathus Assertiveness Schedule

RCT: Randomized Controlled Trial

SCID-5-SPQ: Structured Clinical Interview for DSM-5 Screening Personality Questionnaire

SEK-27: Self-Assessment of Emotional Competencies-27

SF-12: 12-Item Short Form Health Survey

SFQ: Social Functioning Questionnaire

SPIRIT: Standard Protocol Items: Recommendations for Interventional Trials

SUTAQ: Service User Technology Acceptability Questionnaire

T1: Baseline

T2: 12 weeks mid-assessment

T3: 24 weeks post-assessment

T4: Follow-up assessment

UEQ-S: User Experience Questionnaire Short

USE: Usefulness scale for patient information material

VAS: Visual Analog Scale

WAI-O: Working Alliance Inventory – Observer Form

Declarations

Ethics approval and consent to participate

The study was approved by the ethics committee of the Friedrich-Alexander-Universität Erlangen-Nürnberg (24-28-S, 09.07.2024) and conducted in accordance with the Declaration of Helsinki. Participants gave informed consent in the app.

Consent for publication

Not applicable

Availability of data and materials

The data generated in this study will be stored together with the study protocol in the repository of the Leibniz Institute for Psychology (ZPID), PsychArchives, for ten years after publication. Only fully anonymized data will be shared. Data that cannot be sufficiently anonymized (e.g., audio recordings), data with an increased risk of re-identification, and copyright-protected study materials (e.g., QUATEMAR app and tele-coaching content) will not be publicly available.

Access to the dataset will be restricted to scientific use (“Scientific Use File”) and requires a formal application and data use agreement prohibiting re-identification and sharing with third parties.

Competing interests

M.B. is a stakeholder of the mentalis GmbH, which aims to implement scientific findings related to digital health interventions into routine care. J.K.K., C.L., S.M., and M.S. declare that they have no competing interests.

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Authors' contributions

M.B. conceived and designed the study. J.K.K. wrote the first draft of the manuscript under the supervision of M.B. All authors contributed to interpreting the findings and revising the manuscript. All authors reviewed and approved the final manuscript.

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Declaration of generative AI and AI-assisted technologies in the manuscript preparation process

During the preparation of this work J.K.K. used ChatGPT Version GPT-5 by OpenAI in order to improve the readability and language of the work. After using this tool, J.K.K. reviewed and edited the content as needed and takes full responsibility for the content of the published article.

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Figures

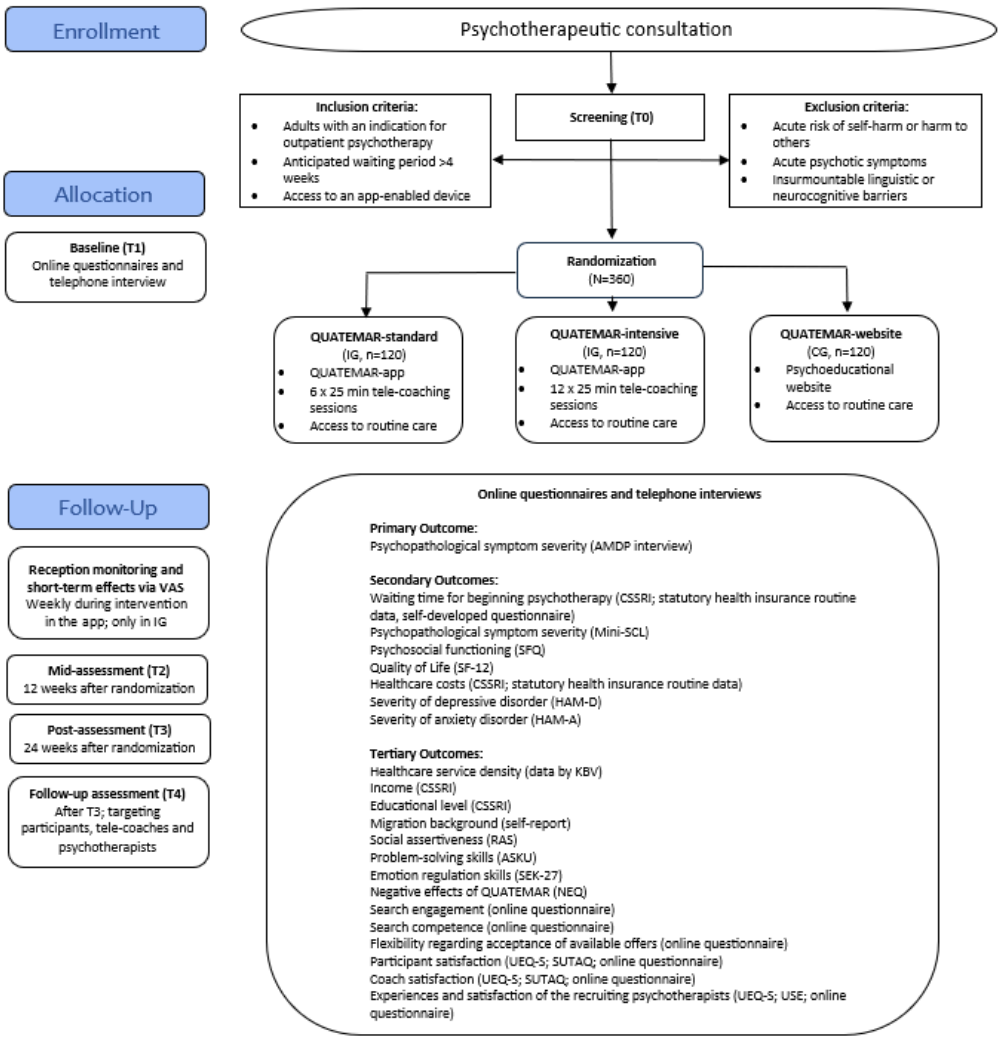


Figure 1

Study flow

Note. AMDP = Association for Methodology and Documentation in Psychiatry via interview (Arbeitsgemeinschaft für Methodik und Dokumentation in der Psychiatrie). ASKU = General Self-Efficacy Short Scale (Allgemeine Selbstwirksamkeit Kurzskala). CG = Control Group. CSSRI = Client Sociodemographic and Service Receipt Inventory. HAM-A = Hamilton Anxiety Rating Scale. HAM-D = Hamilton Depression Rating Scale. IG = Intervention Group. KBV = German National Association of Statutory Health Insurance Physicians (Kassenärztliche Bundesvereinigung). Mini-SCL = Mini Symptom Checklist. NEQ = Negative Effects Questionnaire. QUATEMAR = Qualifizierte Therapieaufnahmeförderung nach Empfehlung einer ambulanten Richtlinienpsychotherapie. RAS = Rathus Assertiveness Schedule. SEK-27 = Self-Assessment of Emotional Competencies. SF-12 = Short-Form Health Survey. SFQ = Social Functioning Questionnaire. SUTAQ = Service User Technology Acceptability Questionnaire. T0 = Screening. T1 = Baseline. T2 = 12 weeks mid-assessment. T3 = 24 weeks post-assessment. T4 = Follow-up assessment. UEQ-S = User Experience Questionnaire Short. USE = Usefulness scale for patient information material. VAS = Visual Analogue Scale.

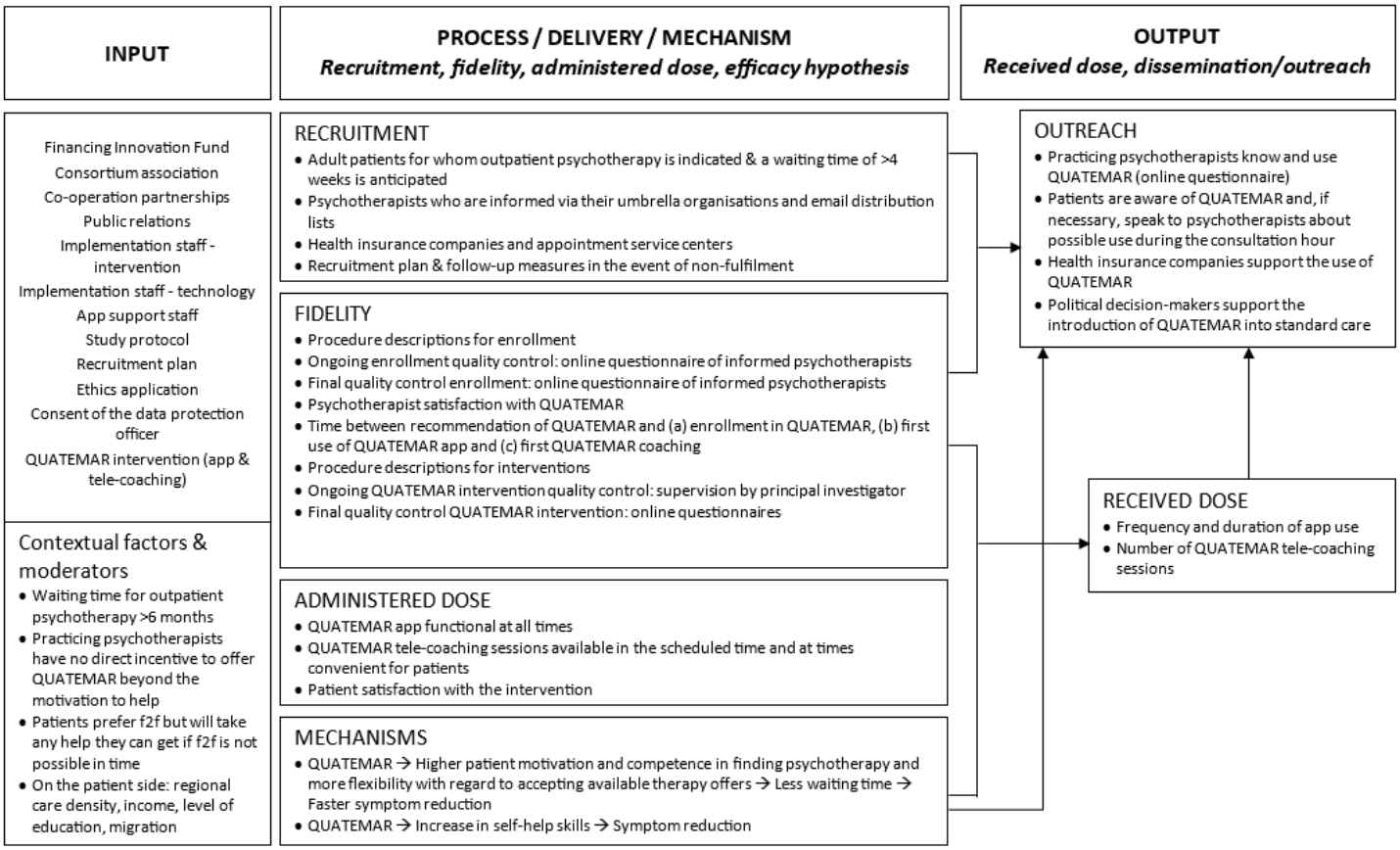


Figure 2

QUATEMAR process model