Clinicians' Perceptions of Mindfulness and Self-Monitoring in Enhancing Emotional Awareness: A Pilot Study

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Abstract

Emotional awareness is a crucial transdiagnostic process influencing emotion regulation and psychological well-being. It is important for individuals' overall health. Nevertheless, there is limited research regarding how specific intervention elements, such as mindfulness and self-monitoring, best enhance emotional awareness within a framework of just-in-time adaptive interventions (JITAIs). JITAIs are tailored interventions to an individual's needs during moments of vulnerability and opportunity. This pilot study aimed to investigate how clinicians rate the effectiveness of mindfulness and self-monitoring in enhancing emotional awareness. The study tested two hypotheses: Clinicians rate mindfulness as more effective than self-monitoring in enhancing emotional awareness, and therapists focusing on cognitive behaviour therapy (CBT) would rate self-monitoring as more effective than mindfulness. A survey was designed and distributed among the researchers' networks. In total, 13 participants participated in the study, with a mean age of 36.38. In the survey, participants matched different intervention elements to transdiagnostic processes. The results of the study indicated that neither hypothesis was supported. However, the high perceived effectiveness ratings of mindfulness and self-monitoring in enhancing emotional awareness are meaningful. Given these high perceived ratings, both intervention elements should be integrated into JITAI frameworks to offer support during moments of vulnerability and opportunity. Finally, future research could build on this pilot study to further explore intervention elements in JITAI settings.

Keywords: Mindfulness, Self-Monitoring, Emotional Awareness, Just-In-Time Adaptive Interventions

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By the age of 75 years, 50% of the population will have developed at least one mental health disorder (McGrath et al., 2023). This represents significant challenges for individuals and healthcare professionals, as many countries' health systems are struggling to keep up with their capacity and timely psychological treatment is often unavailable (Zhang et al., 2024). Furthermore, the global prevalence rate of depression and anxiety increased by 25% in response to the COVID-19 pandemic (World Health Organization, 2022). Despite the increased need for psychological treatment, waiting lists for psychotherapy are long, and patients need to wait approximately seven months to start therapy (Beck et al., 2014). Long waiting times for starting psychotherapy can come with more challenges for individuals, for example, an increase in symptoms, or they may drop out before therapy starts since the system fails to offer timely mental health support (Punton et al., 2022).

Addressing these challenges is crucial. Therefore, it is necessary to explore one potential solution by using new technologies to offer patients treatment options, such as digital mental health interventions. E-health interventions offer many advantages, like easy accessibility and patient availability (Erku et al., 2023). Technologies like apps, sensors, or smartphones allow individuals to monitor their health effectively (Michie et al., 2017). Additionally, these interventions can be used in the mental healthcare sector, especially in the treatment of depression and anxiety (Lipschitz et al., 2022). Research suggests that digital technologies can be as effective as face-to-face treatment because patients can integrate their treatment into their daily lives (Van Orden et al., 2022). These technologies are beneficial because they enable patients to seek help whenever needed. Therefore, implementing e-health interventions into people's daily routines should be considered.

Digital mental health interventions

Over the past few years, digital mental health interventions increased their popularity in society. These interventions positively promote behaviour change (Sawyer et al., 2023). Behaviour change is a concept that tries to modify an individual's behaviour into healthier responses (Carey et al., 2018). One crucial factor in promoting behaviour change is addressing underlying transdiagnostic processes. These transdiagnostic processes are shared across different mental health disorders, such as depression and anxiety (Dalgleish et al., 2020).

Furthermore, the focus of transdiagnostic processes lies on shared processes causing the disorder since many mental health conditions show comorbidities, namely the experience

of more than one mental health disorder (Roefs et al., 2022). Addressing transdiagnostic processes with interventions aims to facilitate positive behaviour change and reduce maladaptive behaviours, emotions, or cognitions (Schaeuffele et al., 2021). Furthermore, various mechanisms of change can be tailored to patients' needs, for example, through interventions promoting emotional awareness (Schaeuffele et al., 2021). In addition, a study underlined the effectiveness of transdiagnostic processes, thus promoting the reduction of anxiety and depression symptoms (Newby et al., 2015). Therefore, patients' treatment outcomes can be enhanced by using these interventions.

In this context, mobile interventions, such as just-in-time adaptive interventions (JITAIs), offer many advantages, including easy and fast support. These interventions provide tailored support at a specific time for an individual. Therefore, the individual can use this intervention at any moment since these interventions provide personalised support to an individual's needs, for example, enhancing emotional awareness or regulating emotional states. Furthermore, JITAIs offer a tailored intervention design that adapts to individual needs, considering the amount of support or treatment during moments of opportunity and vulnerability (Nahum-Shani et al., 2016; Perski et al., 2021). Therefore, these interventions target individuals' emotional states during moments of distress, for example, using mindfulness or self-monitoring practices. Additionally, JITAIs adapt to an individual's changing environment, thus delivering support remotely and offering it to the individual at any moment (Spruijt-Metz et al., 2015). Therefore, it is necessary to understand transdiagnostic processes to evaluate the effectiveness of different intervention elements in a JITAI setting.

Furthermore, evaluating the feasibility of integrating transdiagnostic processes within a JITAI framework is necessary to identify how intervention elements best target these transdiagnostic processes. This ensures that interventions are effectively tailored to an individual's needs. The larger project group of the University of Twente created the JITAI framework (Appendix B). This framework is designed to deliver personalised, adaptive support to individuals based on their needs and circumstances. Hence, this research focuses on targeting transdiagnostic processes. Exploring how intervention elements can effectively address transdiagnostic processes is crucial for addressing multiple mental health conditions. This paper builds upon that foundation by investigating how specific intervention elements, such as mindfulness and self-monitoring, could enhance emotional awareness. Analysing the integration of both intervention elements into the JITAI framework helps determine their effectiveness in providing timely and tailored support for improving mental health conditions.

Research gap

Nevertheless, a significant research gap exists regarding the connection between transdiagnostic processes and intervention elements. Hence, intervention elements must be coupled with different transdiagnostic processes to enhance their effectiveness in targeting various mental health conditions. To further develop JITAIs, it is necessary to conduct more research on how psychological processes and intervention elements are connected. Therefore, developing an adequate mental health taxonomy for matching mental health processes with intervention elements is crucial. However, while the larger research project focuses on developing a framework, this paper focuses on gathering data from clinicians and other experts to improve the framework further. The first step of this larger project included conducting interviews with psychotherapists to gather their expertise. However, the focus of this paper includes piloting a survey study in which clinicians will be asked to match transdiagnostic processes to specific intervention elements. A pilot study aims to test and refine survey and measurement instruments before conducting a more extensive scale study. This pilot study aims to validate the framework of the research team. While the sample size is very small, the pilot study does serve as a starting point for improving the framework, such as the recruiting process of participants or restructuring survey instruments.

The focus lies on validating and improving the current version of the taxonomy that the larger research group of the University of Twente established. Therefore, the framework includes 11 transdiagnostic processes and 18 active intervention elements (Appendix B). Hence, the aim is to expand the knowledge of how processes can be addressed with interventions in the context of JITAIs. Notably, no research studies have established which transdiagnostic processes can be addressed by precise intervention elements within a JITAI framework. Therefore, examining which processes can be best targeted by different intervention elements is valuable.

One transdiagnostic process that is included in the framework is emotional awareness. Emotional awareness is the ability to acknowledge one's own emotions and the emotions of others (Lane & Smith, 2021). Furthermore, emotional awareness is necessary to regulate emotions (Sendzik et al., 2017). A research study underlines that difficulties in emotional awareness might promote depression and anxiety symptoms (Sendzik et al., 2017). Therefore, examining how different intervention elements, such as mindfulness and self-monitoring, can enhance emotional awareness is crucial.

One intervention element that is included in the framework is mindfulness. Practising mindfulness allows patients to be fully aware of the present moment and accept thoughts and

feelings without judgment (Hofmann et al., 2010). Therefore, it makes it easier for individuals to become more aware of their emotional states. Research underlines that a higher rating of emotional awareness helps people better understand their emotions. Furthermore, a better awareness of one's emotions benefits and improves emotion regulation (Guendelman et al., 2017). Mindfulness techniques like meditation or mindful breathing exercises show advantages in reducing anxiety and depression symptoms (Goyal et al., 2014). Therefore, a better knowledge of one's emotions is crucial for increasing emotional awareness and enhancing coping skills in several situations.

Another intervention element that is integrated into the framework is self-monitoring. Self-monitoring states the importance of monitoring and reflecting on one's behaviour, thoughts, and emotions (Cohen et al., 2012). The skill of self-monitoring is explicitly a cognitive behavioural strategy often included in the therapy room of cognitive behavioural psychotherapists (Bakker & Rickard, 2017). Furthermore, it is used to restructure the maladaptive processes of the client through self-monitoring exercises, thus improving mental health conditions and increasing emotional awareness (Bakker & Rickard, 2017). Self-monitoring techniques do not explicitly focus on the present moment. Therefore, it might be less effective in reducing emotional reactivity.

In addition, it will be argued whether therapists with a stronger focus on cognitive behavioural therapy (CBT) may rate self-monitoring as more effective than mindfulness in improving emotional awareness. It is assumed that self-monitoring is a key skill in CBT, and therefore, CBT psychotherapists might prefer this approach, which includes cognitive and behavioural processes. However, this hypothesis is addressed in an exploratory way. It is important to understand whether CBT psychotherapists display a preference for self-monitoring over mindfulness techniques within their therapeutic approach. This study aims to investigate clinicians' ratings of the perceived effectiveness of mindfulness and self-monitoring in improving emotional awareness. Therefore, addressing this research gap regarding mindfulness and self-monitoring techniques in enhancing emotional awareness would be beneficial. Thus, based on existing research, the following hypotheses have been formulated:

H1: Clinicians rate mindfulness as more effective than self-monitoring in improving emotional awareness.

H2: Therapists with a focus on CBT rate self-monitoring as more effective than mindfulness in improving emotional awareness.

Methods

Study design

This study aimed at advancing a framework for JITAIs in mental health care. The goal of the study was to enhance the expertise of addressing relevant mental health processes by matching them with the most appropriate interventions. This project was a pilot study. Therefore, the focus was testing the feasibility of using surveys to capture clinical expertise, highlighting challenges, restructuring survey instruments, and optimising the sampling strategy.

Participants

The participants for this study were contacted through the researchers' network, via e-mail, or WhatsApp. The first inclusion criterion was that participants must be 18 years or older. The second criterion was working as a licensed psychotherapist, being a clinical trainee, a clinical master's student or a bachelor's student with a focus on clinical psychology. This criterion ensured that all had clinical experience and knowledge. Participants have been recruited through purposive sampling. In total, 23 participants filled out the survey. However, one participant did not provide informed consent, nine participants did not finish the survey or dropped out due to factors like lack of time or loss of interest. After excluding these respondents, 13 participants remained in the study.

Materials

An online questionnaire was created using Qualtrics (Appendix C). The researcher created the questionnaire using the framework of the larger research group of the University of Twente as a guideline. Moreover, the survey could be completed on any device with internet access, such as a mobile phone, tablet or laptop. In total, the survey consisted of 198 items. These items included 18 different intervention elements and 11 transdiagnostic processes. Therefore, the researchers matched each of the 18 intervention elements with the 11 different transdiagnostic processes. For example, participants were asked how effectively they would rate the following intervention elements in addressing emotional awareness. To match the intervention elements with transdiagnostic processes, a 7-point Likert scale was utilised. The clinicians rated the effectiveness of different intervention elements using a 7-point Likert scale. One presented "very ineffective", four represented „neither ineffective nor effective", and seven presented "very effective".

Procedure

Before starting data collection, the project was approved by the University of Twente's BMS ethics committee under approval number 240977 on 5 November 2024. If the participants decided to participate in the survey, they were referred to the Qualtrics questionnaire. After reading through the information of the study, the psychotherapists needed to give informed consent. Furthermore, they were also informed about their right to quit the study at any moment without explaining their decision. When the participants agreed to participate in the study, they were asked demographic questions (age, gender, country of employment). If the participant was a licensed psychotherapist, they needed to state their therapeutic approach and years of experience. If the participant was a student, they needed to indicate their relation to clinical psychology. Afterwards, the participants were asked to rate the different transdiagnostic mechanisms with the intervention elements. The survey lasted about 15 minutes.

Data analysis

Preparation of data

The data was prepared in Excel. To start with the analysis, the data from Qualtrics was converted into an Excel file and transferred to R. This was the statistical program for further analysis. Necessary packages were broom, tidyverse, janitor, readxl, ggplot2, modelr, and stats. Appendix D includes the entire R script.

Descriptives

Furthermore, descriptives such as gender, age, and country were analysed. The measures of central tendency were calculated in R, the mean age and standard deviation of participants, age range and the number and percentages of each gender and country of employment.

H1: Effectiveness of mindfulness vs. self-monitoring in emotional awareness

A paired t-test was considered to test the first hypothesis. The data were examined for parametric assumptions. The assumption of normality of residuals was tested, and the data was checked for outliers before proceeding with inferential statistics.

The Shapiro-Wilk test was employed to check the assumption of normality. If the data met the assumption of normality, a paired t-test was applied. However, the Wilcoxon-signed rank test was used because the Shapiro-Wilk test indicated a violation of the normality assumption.

H2: CBT therapist's ratings of self-monitoring vs. mindfulness

The second hypothesis was a subgroup analysis. It was examined how therapists with a focus on CBT rated the perceived effectiveness of mindfulness vs. self-monitoring for

enhancing emotional awareness. Due to the insufficient sample size of CBT therapists (n=2), a moderation analysis could not be conducted. The perceived effectiveness ratings of mindfulness and self-monitoring were compared within this subgroup. Therefore, the mean ratings of mindfulness and self-monitoring were compared. Finally, a bar plot was created.

Results

Descriptive statistics

The sample's descriptive statistics were calculated before proceeding with inferential data analyses. Participants were at least 18 years old, and the ages ranged between 21 and 60 years, with a mean age of 36.38, a median of 37, and a standard deviation of 14.19. The sample comprised six female participants (46.15%) and seven male participants (53.85%). Most participants worked in the Netherlands (n=9, 69.23%), three participants worked in Germany (23.08%), and one participant worked in another country (7.69%). Furthermore, four participants worked as researchers (30.8%), one participant as a basispsycholoog (7.7%), two as licensed psychotherapists (15.4%), one as a psychologist (7.7%), and three psychology students (23.1%). Two participants did not share their occupation (15.4%). In addition, both psychotherapists focused on CBT (15.4%), one stating five years of work experience and the other ten years.

Perceived effectiveness ratings for emotional awareness

The perceived effectiveness ratings of mindfulness and self-monitoring regarding emotional awareness have been analysed. Therefore, a table was created showing the mean, median, and standard deviation in improving emotional awareness (Table 1).

Table 1

Perceived Effectiveness Ratings Emotional Awareness

Intervention element	M	Md	SD
Mindfulness	6.46	7	0.78
Self-monitoring	5.92	6	0.86

Note. M = Mean, Md = Median, SD = Standard deviation

H1: Perceived Effectiveness of Mindfulness vs. Self-Monitoring in Emotional Awareness

Before performing a paired t-test to examine the effectiveness of mindfulness and self-monitoring in improving emotional awareness, the data's assumption of normality was checked. The normality of differences was examined with the Shapiro–Wilk test. The Shapiro–Wilk test results indicated that the data of the self-monitoring ratings were not normally distributed, W (30) = 0.85, p = 0.03. Similarly, the mindfulness ratings were not normally distributed, W (30) = 0.71, p = 0.006. Therefore, the normality assumption was

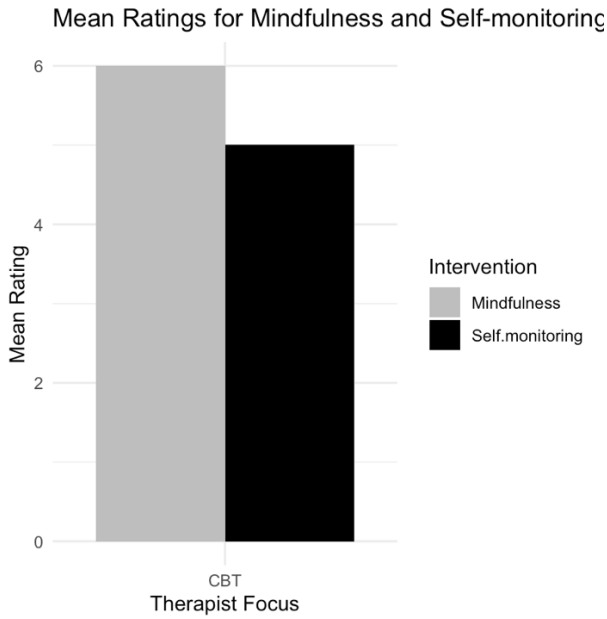
violated, and outliers were not reported. Hence, the paired t-test did not meet the required assumptions. Therefore, the Wilcoxon signed–rank test was performed. The Wilcoxon signed-rank test compared the perceived effectiveness of mindfulness and self-monitoring in improving emotional awareness. The results highlighted no significant difference between the two intervention elements, $V = 45$, $p = 0.059$. Thus, clinicians did not rate mindfulness as more effective than self-monitoring in improving emotional awareness.

H2: CBT Therapist's Ratings of Self-Monitoring vs. Mindfulness

Due to the small sample size of CBT therapists (n=2), the second hypothesis was tested by comparing the mean ratings of mindfulness and self-monitoring. Mindfulness was rated with a mean of six, and self-monitoring was rated with a mean of five. Furthermore, a bar plot was created showing the mean ratings for mindfulness and self-monitoring (Figure 1).

Figure 1

Mean Ratings for Mindfulness and Self-Monitoring



Discussion

This study investigated how clinicians rate the perceived effectiveness of intervention elements, especially mindfulness in enhancing emotional awareness compared to self-monitoring. Furthermore, the study examined if therapists focusing on CBT rated self-monitoring as more effective than mindfulness. Therefore, the study aimed to enhance the expertise of addressing relevant mental health processes. It was hypothesised that clinicians would rate mindfulness as more effective than self-monitoring in improving emotional

awareness. Additionally, it was expected that therapists with a focus on CBT would favour self-monitoring techniques in improving emotional awareness. However, the results showed that neither hypothesis was supported.

Research findings

First, it can be concluded that clinicians did not rate mindfulness as more effective than self-monitoring in improving emotional awareness. Therefore, according to the experts both intervention elements effectively target emotional awareness and should be integrated into future just-in-time adaptive interventions.

First, mindfulness focuses on the present moment and shows benefits in improving emotional awareness (Guendelman et al., 2017). Although previous research emphasizes mindfulness as an effective approach for enhancing emotional awareness (Keng et al., 2011; Moore & Malinowski, 2009), the findings of this study did not find a significant difference in clinicians' ratings of the perceived effectiveness of mindfulness compared to self-monitoring. These study findings might indicate that both intervention elements are beneficial in improving emotional awareness. Furthermore, mentioning the high perceived effectiveness ratings of both intervention elements is crucial. The perceived effectiveness of mindfulness, rated by clinicians with a mean of 6.46, still illustrates insightful potential for enhancing emotional awareness. Another study explored the association between the prefrontal cortex and proper amygdala responses among people who score high on mindfulness (Kabat-Zinn et al., 1992). The study highlights that more mindful people may better regulate emotional responses through the prefrontal cortical inhibition of the amygdala (Kabat-Zinn et al., 1992). Additionally, brain imaging studies show the positive impact of practising mindfulness. These studies underline empirical evidence for the perceived effectiveness of mindful-based interventions in improving emotional awareness (Hölzel et al., 2010). Even though the first hypothesis was not supported, the high perceived effectiveness ratings by the clinicians are valuable.

Second, self-monitoring intervention elements should be considered in enhancing emotional awareness. Even though it was hypothesized that clinicians would rate mindfulness as more effective compared to self-monitoring, the results indicated that self-monitoring might be similarly effective in improving emotional awareness. According to the perceived effectiveness ratings by clinicians with a mean of 5.92, this intervention element is still of importance. Research supports the role of self-monitoring in restructuring maladaptive processes by tracking thoughts, behaviours, and feelings (Bakker & Rickard, 2017). Therefore, self-monitoring is still an important intervention element.

Furthermore, self-monitoring is a crucial clinical technique in cognitive behavioural therapy (Cohen et al., 2012). This skill allows clients to track and identify the link between their emotions and thoughts (Cohen et al., 2012). Moreover, self-monitoring is a straightforward technique because it clarifies the client's triggers. Therefore, self-monitoring techniques help individuals identify their emotions and thoughts, enabling them to develop coping strategies.

The exploratory hypothesis, which suggested that CBT therapists would prefer self-monitoring over mindfulness, was not supported. As the second hypothesis was exploratory and little prior research was given, the results should be interpreted cautiously. Therefore, it was assumed that therapists would prefer their therapeutic approach. This assumption was made because most people prefer their therapeutic approach since they use these practices daily. The therapeutic approach refers to a therapist's techniques to address the client's problems in psychotherapy (Castonguay et al., 2023). Moreover, the therapist uses different techniques, such as self-monitoring techniques in cognitive behavioural therapy (Cohen et al., 2012). However, the study's findings showed that CBT therapists did not show a significant preference for the intervention element of self-monitoring. It is necessary to mention that the sample size was insufficient for the second hypothesis. Even though the perceived effectiveness of mindfulness got a slightly higher mean rating than self-monitoring from the CBT therapists, it is important to demonstrate that the tiny sample size can influence this result. Therefore, it is crucial to be cautious about these findings. However, clinicians rated both intervention elements as effective for improving emotional awareness. Lastly, both intervention elements might benefit from being integrated into a JITAI setting.

Limitations

After analysing the study's main findings, it is necessary to consider the limitations of this research. First, the research aim was to pilot a survey among clinicians, and therefore, the sample size (n=13) was considered appropriate for a pilot study (Moore et al., 2011). Even though the statistical power of a pilot study is not as important as in more extensive research studies, the research results should be interpreted carefully regarding the generalizability towards a population (Kunselman, 2024). Furthermore, the pilot study aimed to test the survey's feasibility, justifying and evaluating the measurement scales and the recruitment process for the main study (Kunselman, 2024).

Another study limitation was the high dropout rate of participants who filled out the survey. Given that this was a pilot study, it may have impacted the reliability of the findings and limited the potential to assess the survey's feasibility fully. Furthermore, the questionnaire length might explain the high dropout rate (Peytchev & Peytcheva, 2017). Long surveys foster

participant fatigue and support survey dropout (Ghafourifard, 2024). Furthermore, people get bored of answering repetitive question styles and lose attention, thus influencing survey engagement negatively (Kost & Da Rosa, 2018). To gain the participants' attention, it might be beneficial to include an attention check question (Abbey & Meloy, 2017). Integrating one attention check question might show researchers if participants follow the survey attentively or just click through the questions. Furthermore, regarding the survey setup, including additional factors in the study might be beneficial. For example, considering factors such as the therapist's experience or the client's needs, to get more concise results.

Future research direction

The research findings highlight strengths and limitations. Therefore, this study will be helpful in future research. First, the larger research group and other researchers can use this study as a starting point for future research. Thus, it is necessary to reconsider the questionnaire length (Ghafourifard, 2024). Revising and shortening the survey can increase participants' attention and motivate them to complete the survey. Therefore, the validity and reliability of the survey could be improved (Cobern & Adams, 2020). The pilot study gave insightful results for improving the setup for the larger study. Therefore, researchers can refine measurement instruments and the recruiting process of participants. Hence, the focus should be on obtaining more generalisable results.

Implications and meaningful contribution of the study

This study was the first research investigating the perceived effectiveness of different intervention elements tailored to transdiagnostic processes. Although both hypotheses were not statistically supported, this research still underlines important implications. First, regarding the high perceived mean ratings of mindfulness and self-monitoring, both intervention elements should be integrated into future taxonomies. Therefore, integrating mindfulness and self-monitoring might benefit addressing emotional awareness in clients. Hence, society benefits from this research outcome since digital mental health tools targeting different transdiagnostic processes could be designed. The high perceived effectiveness ratings of mindfulness and self-monitoring by clinicians suggest that researchers could use these findings as a starting point for further developing such tools. This might also improve client outcomes and provide faster support for clients. In addition, researchers should use this pilot study as a starting point for rearranging the research setting, and reformulating and adapting the survey for getting more insightful results.

Conclusion

Overall, the study did not find statistical support for both hypotheses, namely that mindfulness would be rated as more effective than self-monitoring by clinicians. However, this research provides valuable contributions to the development of future taxonomies. While no significant differences were found between both intervention elements, the research suggests that mindfulness and self-monitoring play important roles in enhancing emotional awareness in clients. This is supported by the high perceived ratings by clinicians. Therefore, both intervention elements should be explored more in-depth in future research.

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Appendix

Appendix A

AI-Statement

While preparing this work, the author used ChatGPT, Grammarly, and Scribbr. ChatGPT was used for gathering codes for the data analysis process in R,and help interpret R outcomes. Furthermore, it helped for minor revisions, and sentence structure. Scribbr was used for managing references. In addition, Grammarly was used for checking grammar, sentence structure and spelling of words of the thesis. After using these tools, the author reviewed and edited the content as needed and takes full responsibility of the work.

Appendix B

JITAI – Framework

Transdiagnostic JITAIs for depression and anxiety

Just-in-time adaptive interventions (JITAIs) describe health interventions that dynamically adapt to an individual's needs. With JITAIs, people receive mental health support in moments of vulnerability or opportunity via mobile devices. Moments of vulnerability can be seen as periods in which an individual is more susceptible to experiencing emotional or psychological difficulties (e.g., ruminating when feeling lonely), while moments of opportunity are situations in which a person is more susceptive to enhancement of positive mental health outcomes. JITAIs might be used as an addition to treatment as usual to foster adherence and increase effectiveness, before or after therapy, or as stand-alone treatment. However, to develop precision mental health interventions such as JITAIs for depression and anxiety we need to match mechanism of change that are relevant in these disorders with active intervention elements. This way, we can provide fitting interventions that precisely target specific mechanisms. In addition, we need to understand in which moments interventions should be provided to people. For this we need your clinical expertise.

For the interviews, we would like to follow three steps:

1.) Identify transdiagnostic mechanisms of change in depression and anxiety. These mechanisms are processes that might be targeted during psychological interventions to elicit positive change in a person.
2.) Identify active intervention elements that may target the specific mechanism of change. Active intervention elements can be seen as therapeutic techniques a patient receives and that might lead to change in the suggested mechanism.
3.) Matching specific intervention elements to each mechanism of change. We assume that the same active intervention element can trigger multiple mechanisms, and that one mechanism may be triggered by different active intervention elements.

Step 1: Identifying transdiagnostic mechanisms of change

Based on existing frameworks and empirical studies, we created a theory-driven list of ten transdiagnostic mechanisms of change in depression and anxiety. We further divided them into affective, cognitive, and behavioral mechanisms and functional and dysfunctional mechanisms. Whether a mechanism is functional or dysfunctional is dependent on the context. In general, when a process becomes too rigid and causes limitations for the individual or their environment, it can be seen as dysfunctional. In this first step we are interested in which mechanisms you consider most relevant and most well-suited to be targeted by brief mobile interventions, and if you think any relevant mechanisms are still missing.

Mechanism of change per domain	Description
Affective	
Dysfunctional	
Dampening of positive affect	The process of minimizing or undermining positive emotions.
Functional	
Positive emotion enhancement	Increasing the frequency, intensity, and duration of positive emotions.
Emotional awareness	The ability to recognize and understand one's own emotions and emotions of others.
Cognitive	
Dysfunctional	
Rumination and worrying	The repetitive cognitive focus on distressing thoughts or concerns.
Functional	
Reappraisal	Reinterpreting a situation to change its emotional impact, often by finding a more positive or neutral perspective.
Positive thoughts about self and the world	Compassionate beliefs about oneself, characterized by high self-esteem and self-kindness. An optimistic and hopeful view towards life and the future.
Positive attention and interpretation	Shifting focus towards positive aspects of experiences and interpreting events in a favorable light.
Behavioral	
Dysfunctional	
Avoidance behavior	The tendency to consistently avoid feared situations or unpleasant thoughts and emotions.

Functional	
Approach behavior	Tendency to move towards and engage with positive, rewarding, or goal-oriented activities and experiences, even when facing them might be difficult.
Healthy distraction	Engaging in activities that divert attention from negative thoughts or feelings in a constructive manner.
Social competence	The ability to interact effectively with others and building and maintaining healthy relationships through appropriate social skills and communication strategies.

Step 2: Identifying active intervention elements

We created a theory-driven list of 18 active intervention elements commonly used in psychological interventions. Here we are interested in whether this list is comprehensive and sufficiently covers active intervention elements used in clinical practice. In this second step, we are interested in your expert opinion on these intervention elements.

Active intervention element	Description
Exposure in vivo	Gradually confronting stimuli that are feared without showing avoidance behavior.
Problem solving	A structured approach to defining a problem, finding potential solutions, evaluating options, and implementing the best solution.
Goal-setting	Defining specific, measurable, achievable, relevant, and time-bound (SMART) objectives to guide behavior and track progress.
Self-monitoring	Systematically recording and tracking one's behaviors, thoughts, or emotions, for example through daily diaries or mood charts.
Cognitive restructuring	Identifying and challenging irrational or maladaptive thoughts and replacing them with more constructive ones.
Self-reinforcement	Rewarding oneself for achieving specific goals or exhibiting desired behaviors.
Social skills training	Teaching and practicing strategies to improve interpersonal interactions, relationships, and communication.
Active constructive responding	Responding to others' positive news with enthusiasm and support.
Activity scheduling	Planning and scheduling activities that are likely to be enjoyable, meaningful or provide a sense of accomplishment.
Behavior experiment	Testing out new behaviors or challenging beliefs in real-world situations.
Self-compassion	Fostering self-esteem and self-kindness in the face of difficulties or personal shortcomings. May involve practices such as writing self-compassionate letters.
Mindfulness	Paying attention to the present moment with an open, non-judgmental attitude. May involve practices such as mindful breathing or body scan meditation.
Acceptance	Acknowledging and embracing thoughts, feelings, and experiences without trying to change, judge, or avoid them, even when they are uncomfortable.
Savoring	Fully enjoying and appreciating positive events and moments. May involve present moments, but also past or future events.
Optimism and hope	Fostering a positive and hopeful outlook towards life and the future. May involve gratitude exercises or visualizing positive future scenarios.
Personal strengths	Identifying and using one's talents and abilities.
Valued action	Engaging in behaviors that are consistent with one's personal values and long-term goals.
Mental imagery	Visualization techniques to create mental pictures of positive outcomes, desired behaviors, relaxing scenes, or safe spaces.

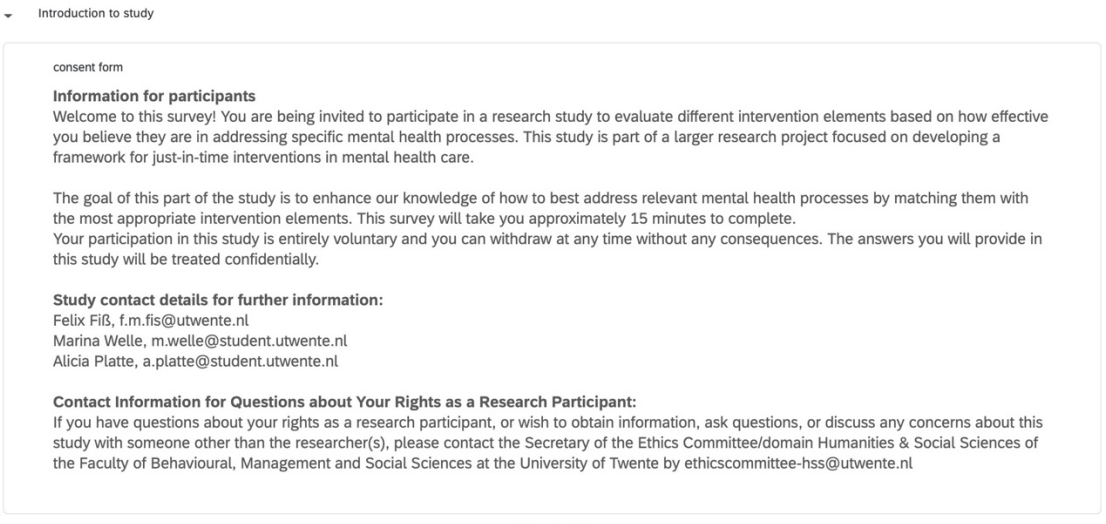
Step 3: Matching mechanisms and active intervention elements

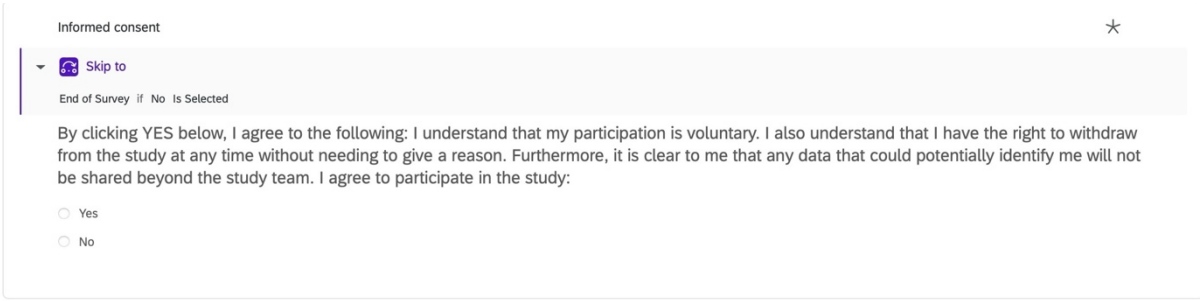
We then matched each mechanism of change to multiple active intervention elements for which we expect that, based on theory, these intervention elements would lead to change in the proposed mechanism. For example, savoring may help to reduce the dampening of positive affect by encouraging individuals to fully experience and appreciate positive events or accomplishments. Here, we are interested in how you would match mechanisms of change and intervention elements. During the interview, we will use a card-sorting task to facilitate this process.

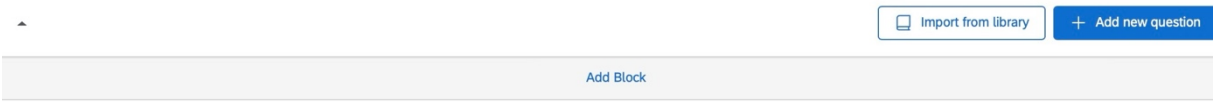
Mechanism of change per domain	Active intervention element
Affective	
Dampening of positive affect	Savoring Self-reinforcement Self-compassion
Positive emotion enhancement	Savoring Activity scheduling Mental imagery
Emotional awareness	Mindfulness Self-monitoring
Cognitive	
Rumination and worrying	Problem solving Cognitive restructuring Acceptance Mindfulness
Reappraisal	Cognitive restructuring Mental imagery Problem solving
Positive thoughts about self and the world	Cognitive restructuring Self-compassion Optimism and hope Personal strengths Mental imagery
Positive attention and interpretation	Cognitive restructuring Savoring Optimism and hope Mental imagery
Behavioral	
Avoidance behavior	Exposure in vivo Behavior experiment Goal-setting Acceptance
Approach behavior	Goal-setting Activity scheduling Valued action
Healthy distraction	Goal-setting Problem solving Activity scheduling
Social competence	Social skills training Active constructive responding Behavior experiment Personal strengths Self-compassion

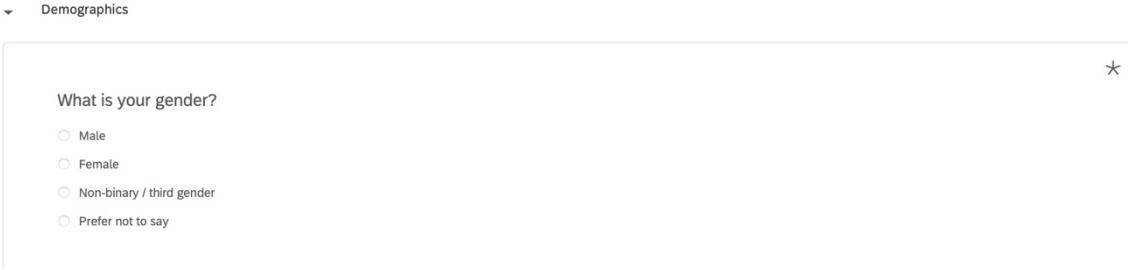
Appendix C

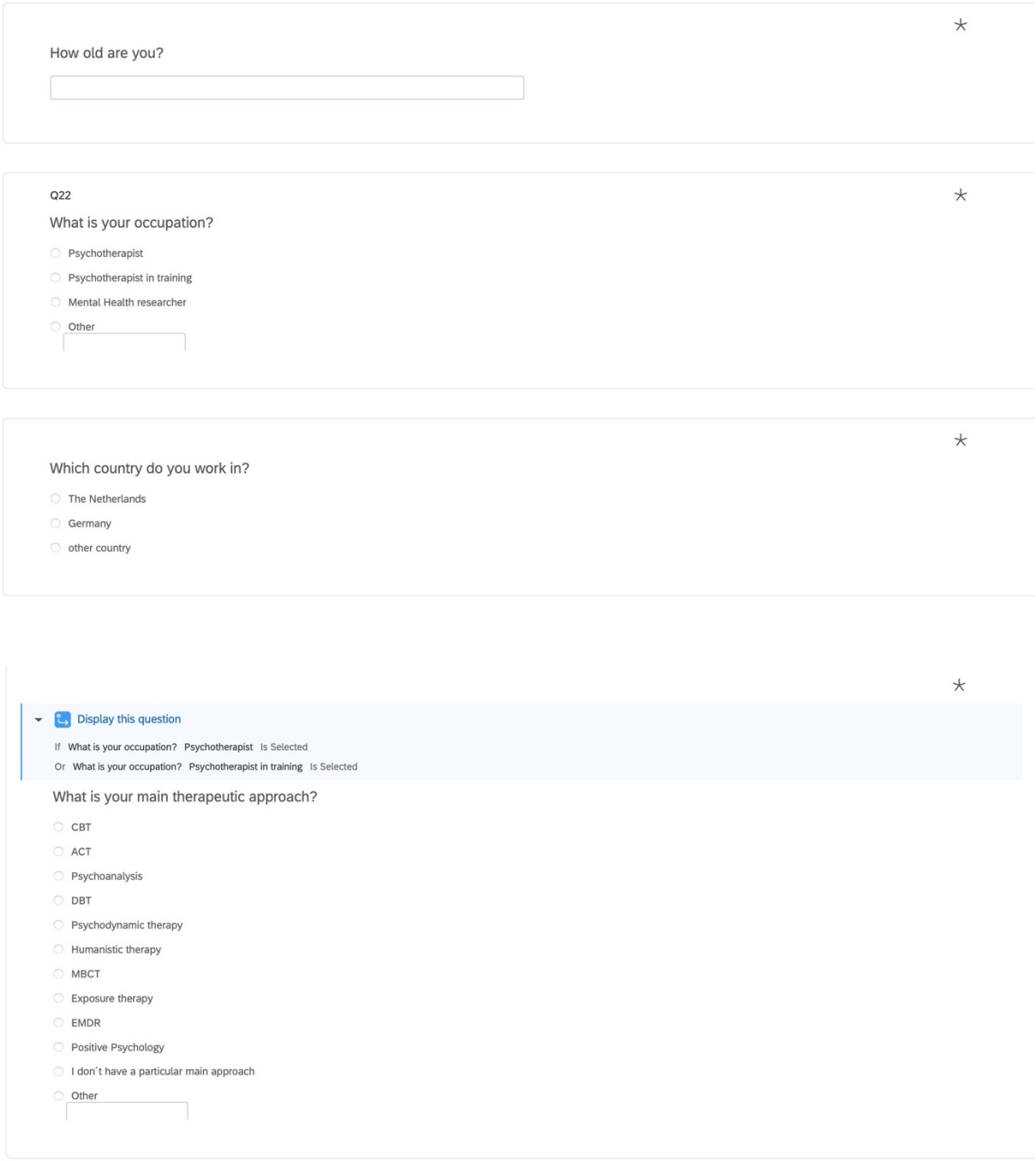
Qualtrics Questionnaire











How old are you?

Q22

What is your occupation?

- Psychotherapist
- Psychotherapist in training
- Mental Health researcher
- Other

Which country do you work in?

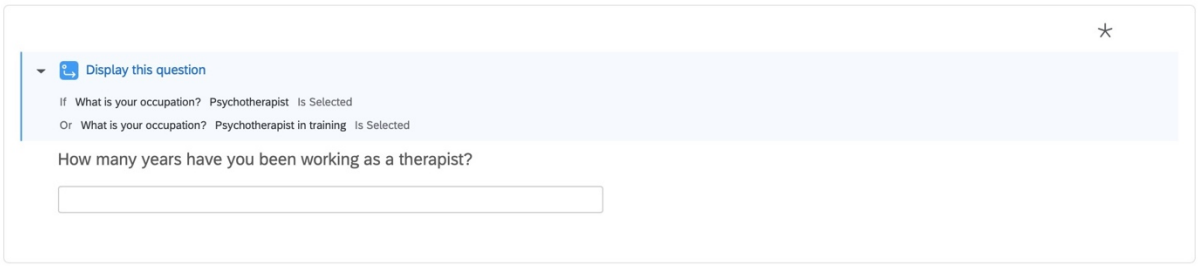
- The Netherlands
- Germany
- other country

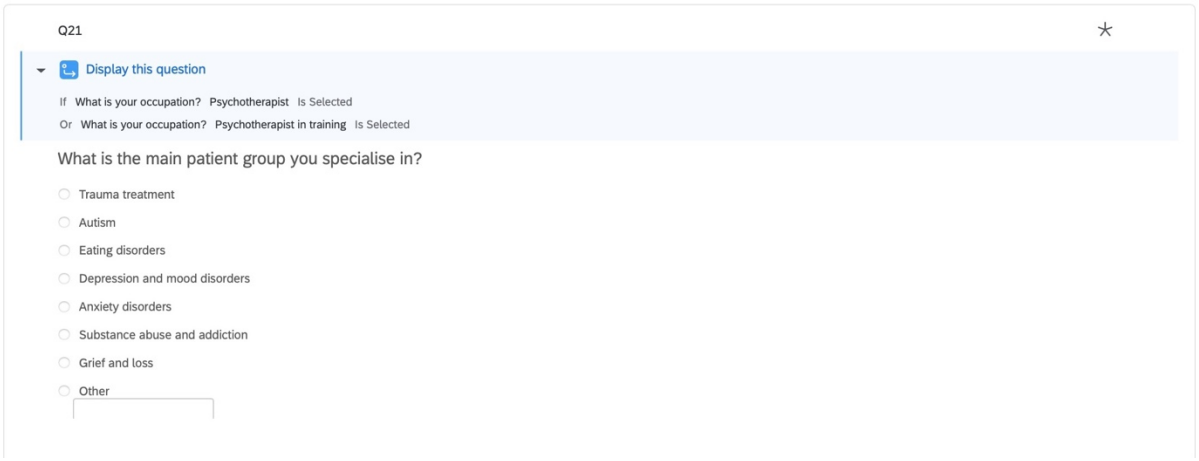
Display this question

If What is your occupation? Psychotherapist Is Selected
Or What is your occupation? Psychotherapist in training Is Selected

What is your main therapeutic approach?

- CBT
- ACT
- Psychoanalysis
- DBT
- Psychodynamic therapy
- Humanistic therapy
- MBCT
- Exposure therapy
- EMDR
- Positive Psychology
- I don´t have a particular main approach
- Other





Introduction Matching Task

Introduction-rating

Introduction rating task
As the next step, we would like to ask you to rate 18 different intervention elements based on how effective you think they are for each of the 11 transdiagnostic processes that we have currently included in our framework. You will be asked to rate the intervention elements per process, one at a time. The processes and intervention elements that will be mentioned in this survey are described below.

Transdiagnostic processes: dampening of positive affect, positive emotion enhancement, emotional awareness, rumination and worrying, reappraisal, positive thoughts about self and the world, positive attention and interpretation, avoidance behavior, approach behavior, healthy distraction, social competence

Intervention elements: exposure in vivo, problem solving, goal-setting, self-monitoring, cognitive restructuring, self-reinforcement, social skills training, active constructive responding, activity scheduling, behavior experiment, self-compassion, mindfulness, acceptance, savoring, optimism and hope, personal strengths, valued action, mental imagery

If you would like to have a definition of any of the intervention elements mentioned above, you can click the button below. You will be able to also request those definitions during the actual questionnaire. Definitions for transdiagnostic processes will be provided in the moment we specifically ask you about them.

Button

Click to show a definition of all intervention elements

- **Exposure in vivo:** Gradually confronting stimuli that are feared without showing avoidance behavior.
- **Problem solving:** A structured approach to defining a problem, finding potential solutions, evaluating options, and implementing the best solution.
- **Goal-setting:** Defining specific, measurable, achievable, relevant, and time-bound (SMART) objectives to guide behavior and track progress.
- **Self-monitoring:** Systematically recording and tracking one's behaviors, thoughts, or emotions, for example through daily diaries or mood charts.
- **Cognitive restructuring:** Identifying and challenging irrational or maladaptive thoughts and replacing them with more constructive ones.
- **Self-reinforcement:** Rewarding oneself for achieving specific goals or exhibiting desired behaviors.
- **Social skills training:** Teaching and practicing strategies to improve interpersonal interactions, relationships, and communication.
- **Active constructive responding:** Responding to others' positive news with enthusiasm and support.
- **Activity scheduling:** Planning and scheduling activities that are likely to be enjoyable, meaningful or provide a sense of accomplishment.
- **Behavior experiment:** Testing out new behaviors or challenging beliefs in real-world situations.
- **Self-compassion:** Fostering self-esteem and self-kindness in the face of difficulties or personal shortcomings. May involve practices such as writing self-compassionate letters.
- **Mindfulness:** Paying attention to the present moment with an open, non-judgmental attitude. May involve practices such as mindful breathing or body scan meditation.
- **Acceptance:** Acknowledging and embracing thoughts, feelings, and experiences without trying to change, judge, or avoid them, even when they are uncomfortable.
- **Savoring:** Fully enjoying and appreciating positive events and moments. May involve present moments, but also past or future events.
- **Optimism and hope:** Fostering a positive and hopeful outlook towards life and the future. May involve gratitude exercises or visualizing positive future scenarios.
- **Personal strengths:** Identifying and using one's talents and abilities.
- **Valued action:** Engaging in behaviors that are consistent with one's personal values and long-term goals.
- **Mental imagery:** Visualization techniques to create mental pictures of positive outcomes, desired behaviors, relaxing scenes, or safe spaces.

dampening

How effective would you rate the following intervention elements in addressing **dampening of positive affect**?

	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Exposure in vivo	○	○	○	○	○	○	○
Problem solving	○	○	○	○	○	○	○
Goal setting	○	○	○	○	○	○	○
Self-monitoring	○	○	○	○	○	○	○
Cognitive restructuring	○	○	○	○	○	○	○
Self-reinforcement	○	○	○	○	○	○	○
	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Social skills training	○	○	○	○	○	○	○
Active constructive responding	○	○	○	○	○	○	○
Activity scheduling	○	○	○	○	○	○	○
Behaviour experiment	○	○	○	○	○	○	○
Self-compassion	○	○	○	○	○	○	○
Mindfulness	○	○	○	○	○	○	○
	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Acceptance	○	○	○	○	○	○	○
Savouring	○	○	○	○	○	○	○
Optimism and hope	○	○	○	○	○	○	○
Personal strengths	○	○	○	○	○	○	○
Valued action	○	○	○	○	○	○	○
Mental imagery	○	○	○	○	○	○	○

emotion enhancement

How effective would you rate the following intervention elements in addressing **positive emotion enhancement**?

	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Exposure in vivo	○	○	○	○	○	○	○
Problem solving	○	○	○	○	○	○	○
Goal setting	○	○	○	○	○	○	○
Self-monitoring	○	○	○	○	○	○	○
Cognitive restructuring	○	○	○	○	○	○	○
Self-reinforcement	○	○	○	○	○	○	○
	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Social skills training	○	○	○	○	○	○	○
Active constructive responding	○	○	○	○	○	○	○
Activity scheduling	○	○	○	○	○	○	○
Behaviour experiment	○	○	○	○	○	○	○
Self-compassion	○	○	○	○	○	○	○
Mindfulness	○	○	○	○	○	○	○
	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Acceptance	○	○	○	○	○	○	○
Savouring	○	○	○	○	○	○	○
Optimism and hope	○	○	○	○	○	○	○
Personal strengths	○	○	○	○	○	○	○
Valued action	○	○	○	○	○	○	○
Mental imagery	○	○	○	○	○	○	○

emotional awareness

How effective would you rate the following intervention elements in addressing **emotional awareness**?

	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Exposure in vivo	○	○	○	○	○	○	○
Problem solving	○	○	○	○	○	○	○
Goal setting	○	○	○	○	○	○	○
Self-monitoring	○	○	○	○	○	○	○
Cognitive restructuring	○	○	○	○	○	○	○
Self-reinforcement	○	○	○	○	○	○	○
	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Social skills training	○	○	○	○	○	○	○
Active constructive responding	○	○	○	○	○	○	○
Activity scheduling	○	○	○	○	○	○	○
Behaviour experiment	○	○	○	○	○	○	○
Self-compassion	○	○	○	○	○	○	○
Mindfulness	○	○	○	○	○	○	○
	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Acceptance	○	○	○	○	○	○	○
Savouring	○	○	○	○	○	○	○
Optimism and hope	○	○	○	○	○	○	○
Personal strengths	○	○	○	○	○	○	○
Valued action	○	○	○	○	○	○	○
Mental imagery	○	○	○	○	○	○	○

rumination

How effective would you rate the following intervention elements in addressing **rumination and worrying**?

	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective not effective	Slightly effective	Effective	Very effective
Exposure in vivo	○	○	○	○	○	○	○
Problem solving	○	○	○	○	○	○	○
Goal setting	○	○	○	○	○	○	○
Self-monitoring	○	○	○	○	○	○	○
Cognitive restructuring	○	○	○	○	○	○	○
Self-reinforcement	○	○	○	○	○	○	○

	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective not effective	Slightly effective	Effective	Very effective
Social skills training	○	○	○	○	○	○	○
Active constructive responding	○	○	○	○	○	○	○
Activity scheduling	○	○	○	○	○	○	○
Behaviour experiment	○	○	○	○	○	○	○
Self-compassion	○	○	○	○	○	○	○
Mindfulness	○	○	○	○	○	○	○

	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective not effective	Slightly effective	Effective	Very effective
Acceptance	○	○	○	○	○	○	○
Savouring	○	○	○	○	○	○	○
Optimism and hope	○	○	○	○	○	○	○
Personal strengths	○	○	○	○	○	○	○
Valued action	○	○	○	○	○	○	○
Mental imagery	○	○	○	○	○	○	○

reappraisal

How effective would you rate the following intervention elements in addressing **reappraisal**?

	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Exposure in vivo	○	○	○	○	○	○	○
Problem solving	○	○	○	○	○	○	○
Goal setting	○	○	○	○	○	○	○
Self-monitoring	○	○	○	○	○	○	○
Cognitive restructuring	○	○	○	○	○	○	○
Self-reinforcement	○	○	○	○	○	○	○

	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Social skills training	○	○	○	○	○	○	○
Active constructive responding	○	○	○	○	○	○	○
Activity scheduling	○	○	○	○	○	○	○
Behaviour experiment	○	○	○	○	○	○	○
Self-compassion	○	○	○	○	○	○	○
Mindfulness	○	○	○	○	○	○	○

	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Acceptance	○	○	○	○	○	○	○
Savouring	○	○	○	○	○	○	○
Optimism and hope	○	○	○	○	○	○	○
Personal strengths	○	○	○	○	○	○	○
Valued action	○	○	○	○	○	○	○
Mental imagery	○	○	○	○	○	○	○

positive thoughts

How effective would you rate the following intervention elements in addressing **positive thoughts about self and the world**?

	Very ineffective	Ineffective	Slightly ineffective	Neither effective nor effective	Slightly effective	Effective	Very effective
Exposure in vivo	○	○	○	○	○	○	○
Problem solving	○	○	○	○	○	○	○
Goal setting	○	○	○	○	○	○	○
Self-monitoring	○	○	○	○	○	○	○
Cognitive restructuring	○	○	○	○	○	○	○
Self-reinforcement	○	○	○	○	○	○	○
	Very ineffective	Ineffective	Slightly ineffective	Neither effective nor effective	Slightly effective	Effective	Very effective
Social skills training	○	○	○	○	○	○	○
Active constructive responding	○	○	○	○	○	○	○
Activity scheduling	○	○	○	○	○	○	○
Behaviour experiment	○	○	○	○	○	○	○
Self-compassion	○	○	○	○	○	○	○
Mindfulness	○	○	○	○	○	○	○
	Very ineffective	Ineffective	Slightly ineffective	Neither effective nor effective	Slightly effective	Effective	Very effective
Acceptance	○	○	○	○	○	○	○
Savouring	○	○	○	○	○	○	○
Optimism and hope	○	○	○	○	○	○	○
Personal strengths	○	○	○	○	○	○	○
Valued action	○	○	○	○	○	○	○
Mental imagery	○	○	○	○	○	○	○

positive attention

How effective would you rate the following intervention elements in addressing **positive attention and interpretation**?

	Very Ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Exposure in vivo	○	○	○	○	○	○	○
Problem solving	○	○	○	○	○	○	○
Goal setting	○	○	○	○	○	○	○
Self-monitoring	○	○	○	○	○	○	○
Cognitive restructuring	○	○	○	○	○	○	○
Self-reinforcement	○	○	○	○	○	○	○
	Very Ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Social skills training	○	○	○	○	○	○	○
Active constructive responding	○	○	○	○	○	○	○
Activity scheduling	○	○	○	○	○	○	○
Behaviour experiment	○	○	○	○	○	○	○
Self-compassion	○	○	○	○	○	○	○
Mindfulness	○	○	○	○	○	○	○
	Very Ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Acceptance	○	○	○	○	○	○	○
Savouring	○	○	○	○	○	○	○
Optimism and hope	○	○	○	○	○	○	○
Personal strengths	○	○	○	○	○	○	○
Valued action	○	○	○	○	○	○	○
Mental imagery	○	○	○	○	○	○	○

avoidance behaviour

How effective would you rate the following intervention elements in addressing **avoidance behaviour**?

	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Exposure in vivo	○	○	○	○	○	○	○
Problem solving	○	○	○	○	○	○	○
Goal setting	○	○	○	○	○	○	○
Self-monitoring	○	○	○	○	○	○	○
Cognitive restructuring	○	○	○	○	○	○	○
Self-reinforcement	○	○	○	○	○	○	○

	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Social skills training	○	○	○	○	○	○	○
Active constructive responding	○	○	○	○	○	○	○
Activity scheduling	○	○	○	○	○	○	○
Behaviour experiment	○	○	○	○	○	○	○
Self-compassion	○	○	○	○	○	○	○
Mindfulness	○	○	○	○	○	○	○

	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Acceptance	○	○	○	○	○	○	○
Savouring	○	○	○	○	○	○	○
Optimism and hope	○	○	○	○	○	○	○
Personal strengths	○	○	○	○	○	○	○
Valued action	○	○	○	○	○	○	○
Mental imagery	○	○	○	○	○	○	○

approach behaviour

How effective would you rate the following intervention elements in addressing **approach behaviour**?

	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Exposure in vivo	○	○	○	○	○	○	○
Problem solving	○	○	○	○	○	○	○
Goal setting	○	○	○	○	○	○	○
Self-monitoring	○	○	○	○	○	○	○
Cognitive restructuring	○	○	○	○	○	○	○
Self-reinforcement	○	○	○	○	○	○	○

	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Social skills training	○	○	○	○	○	○	○
Active constructive responding	○	○	○	○	○	○	○
Activity scheduling	○	○	○	○	○	○	○
Behaviour experiment	○	○	○	○	○	○	○
Self-compassion	○	○	○	○	○	○	○
Mindfulness	○	○	○	○	○	○	○

	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Acceptance	○	○	○	○	○	○	○
Savouring	○	○	○	○	○	○	○
Optimism and hope	○	○	○	○	○	○	○
Personal strengths	○	○	○	○	○	○	○
Valued action	○	○	○	○	○	○	○
Mental imagery	○	○	○	○	○	○	○

healthy distraction

How effective would you rate the following intervention elements in addressing **healthy distraction**?

	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Exposure in vivo	○	○	○	○	○	○	○
Problem solving	○	○	○	○	○	○	○
Goal setting	○	○	○	○	○	○	○
Self-monitoring	○	○	○	○	○	○	○
Cognitive restructuring	○	○	○	○	○	○	○
Self-reinforcement	○	○	○	○	○	○	○

	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Social skills training	○	○	○	○	○	○	○
Active constructive responding	○	○	○	○	○	○	○
Activity scheduling	○	○	○	○	○	○	○
Behaviour experiment	○	○	○	○	○	○	○
Self-compassion	○	○	○	○	○	○	○
Mindfulness	○	○	○	○	○	○	○

	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Acceptance	○	○	○	○	○	○	○
Savouring	○	○	○	○	○	○	○
Optimism and hope	○	○	○	○	○	○	○
Personal strengths	○	○	○	○	○	○	○
Valued action	○	○	○	○	○	○	○
Mental imagery	○	○	○	○	○	○	○

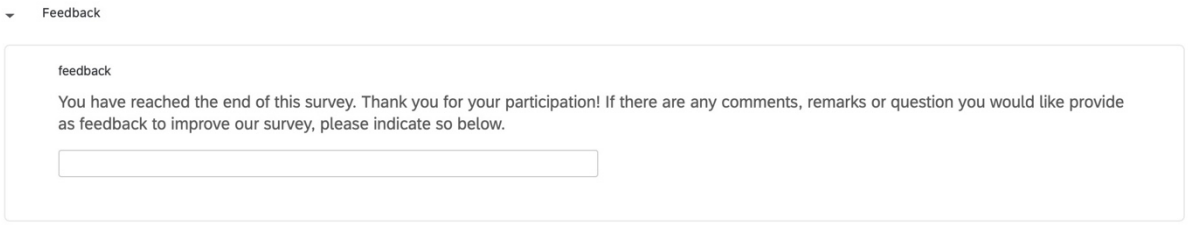
social competence

How effective would you rate the following intervention elements in addressing **social competence**?

	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Exposure in vivo	○	○	○	○	○	○	○
Problem solving	○	○	○	○	○	○	○
Goal setting	○	○	○	○	○	○	○
Self-monitoring	○	○	○	○	○	○	○
Cognitive restructuring	○	○	○	○	○	○	○
Self-reinforcement	○	○	○	○	○	○	○

	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Social skills training	○	○	○	○	○	○	○
Active constructive responding	○	○	○	○	○	○	○
Activity scheduling	○	○	○	○	○	○	○
Behaviour experiment	○	○	○	○	○	○	○
Self-compassion	○	○	○	○	○	○	○
Mindfulness	○	○	○	○	○	○	○

	Very ineffective	Ineffective	Slightly ineffective	Neither ineffective nor effective	Slightly effective	Effective	Very effective
Acceptance	○	○	○	○	○	○	○
Savouring	○	○	○	○	○	○	○
Optimism and hope	○	○	○	○	○	○	○
Personal strengths	○	○	○	○	○	○	○
Valued action	○	○	○	○	○	○	○
Mental imagery	○	○	○	○	○	○	○


Feedback
feedback
You have reached the end of this survey. Thank you for your participation! If there are any comments, remarks or question you would like provide as feedback to improve our survey, please indicate so below.

Appendix D

R-Script

```
library(broom)
library(tidyverse)
library(janitor)
library(readxl)
library(ggplot2)
library(interactions)
library(modelr)
library(stats)

getwd()
Clinicians <- read_excel("~/Desktop/Data analysis/Clinicians.xlsx")
Clinicians <- read_excel("~/Desktop/Data analysis/Clinicians.xlsx")

View(Clinicians)
colnames(Clinicians)

str(Clinicians)

getwd()

#descriptive analysis
summary(Clinicians)
summary(Clinicians$age)
sd(Clinicians$age)
table(Clinicians$gender)
summary(Clinicians$country)
table(Clinicians$country)

# Create a new variable for the differences between Mindfulness and Self-monitoring
Clinicians$Difference <- Clinicians$Mindfulness - Clinicians$Self-monitoring

# Perform Shapiro-Wilk test for normality of the differences
shapiro_test <- shapiro.test(Clinicians$Difference)

# Print the results of the normality test
print(shapiro_test)
# Check the column names of your dataset
colnames(Clinicians)

# Create a new variable for the differences between Mindfulness and Self-monitoring
Clinicians$Difference <- Clinicians$Mindfulness - Clinicians$`Self-monitoring`

# Perform Shapiro-Wilk test for normality of the differences
shapiro_test <- shapiro.test(Clinicians$Difference)

# Print the results of the normality test
print(shapiro_test)
# Perform Wilcoxon signed-rank test
```

```
wilcoxon_result <- wilcox.test(Clinicians$Mindfulness, Clinicians$`Self-monitoring`, paired
= TRUE)

# Print the result
print(wilcoxon_result)

# Perform Wilcoxon signed-rank test
wilcoxon_result <- wilcox.test(Clinicians$Mindfulness, Clinicians$`Self-monitoring`, paired
= TRUE)

# Print the result
print(wilcoxon_result)

# Perform the Wilcoxon signed-rank test for Mindfulness vs Self-monitoring ratings
wilcoxon_result <- wilcox.test(Clinicians$Mindfulness,
                               Clinicians$`Self-monitoring`,
                               paired = TRUE)

# View the results
print(wilcoxon_result)

# Calculate the differences
differences <- Clinicians$"Mindfulness" - Clinicians$"Self-monitoring"

# Calculate Cohen's d
mean_diff <- mean(differences)
sd_diff <- sd(differences)
cohen_d <- mean_diff / sd_diff

# Print Cohen's d
print(cohen_d)
```

Hypothese 2

```
#2. hypothesis

# Clean the column names to remove any invalid characters or spaces
colnames(Clinicians) <- make.names(colnames(Clinicians))

# Example: Calculating mean ratings for Mindfulness and Self-monitoring for CBT therapists
# Filter the data for CBT therapists
CBT_therapists <- subset(Clinicians, therapistfocus == "CBT")

# Calculate mean ratings for Mindfulness and Self-monitoring
mean_mindfulness <- mean(CBT_therapists$Mindfulness, na.rm = TRUE)
mean_selfmonitoring <- mean(CBT_therapists$Selfmonitoring, na.rm = TRUE)

# Create a data frame with these mean values for plotting
mean_values <- data.frame(
  TherapistFocus = c("CBT"),  # Focus is CBT
```

```
  Mindfulness = mean_mindfulness,  # Mean for Mindfulness
  Self.monitoring = mean_selfmonitoring  # Mean for Self-monitoring
)

# Reshape the data into long format
library(tidyr)
data_long <- pivot_longer(mean_values,
                          cols = c("Mindfulness", "Self.monitoring"),
                          names_to = "Intervention",
                          values_to = "MeanRating")

# Check the structure of the reshaped data
head(data_long)

# Create a bar plot for the mean ratings
library(ggplot2)
ggplot(data_long, aes(x = TherapistFocus, y = MeanRating, fill = Intervention)) +
  geom_bar(stat = "identity", position = "dodge") +
  labs(title = "Mean Ratings for Mindfulness and Self-monitoring by Therapist Focus",
       y = "Mean Rating",
       x = "Therapist Focus") +
  scale_fill_manual(values = c("Mindfulness" = "blue", "Self.monitoring" = "green")) +
  theme_minimal()


#intervention ratings

# Calculate mean, median, and standard deviation for Mindfulness
mindfulness_stats <- c(
  Mean = mean(Clinicians$Mindfulness, na.rm = TRUE),
  Median = median(Clinicians$Mindfulness, na.rm = TRUE),
  SD = sd(Clinicians$Mindfulness, na.rm = TRUE)
)

# Calculate mean, median, and standard deviation for Selfmonitoring
selfmonitoring_stats <- c(
  Mean = mean(Clinicians$Selfmonitoring, na.rm = TRUE),
  Median = median(Clinicians$Selfmonitoring, na.rm = TRUE),
  SD = sd(Clinicians$Selfmonitoring, na.rm = TRUE)
)

# Print the results
print("Mindfulness Intervention Ratings (Emotional Awareness):")
print(mindfulness_stats)

print("Self-monitoring Intervention Ratings (Emotional Awareness):")
print(selfmonitoring_stats)
```

Assumption check

```
library(broom)
library(tidyverse)
library(janitor)
library(readxl)
library(ggplot2)
library(interactions)
library(modelr)
library(stats)

getwd()
Clinicians <- read_excel("~/Desktop/Data analysis/Clinicians.xlsx")
Clinicians <- read_excel("~/Desktop/Data analysis/Clinicians.xlsx")

View(Clinicians)
colnames(Clinicians)

str(Clinicians)

getwd()

#descriptive analysis
summary(Clinicians)
summary(Clinicians$age)
sd(Clinicians$age)
table(Clinicians$gender)
summary(Clinicians$country)
table(Clinicians$country)

# Install necessary packages (if not already installed)
install.packages("readxl")  # For reading Excel files
install.packages("car")     # For Levene's test

# Load the libraries
library(readxl)
library(car)
# Load the Excel file (replace 'your_file.xlsx' with the actual file name)
Clinicians <- Clinicians <- read_excel("Desktop/Data analysis/Clinicians.xlsx")
View(Clinicians)

# Inspect the data to confirm it loaded correctly
head(data)

#assumptions normality
# Shapiro-Wilk test for Mindfulness ratings
shapiro.test(data$Mindfulness)

# Shapiro-Wilk test for Selfmonitoring ratings
shapiro.test(data$Selfmonitoring)
```

```
# Create a new variable for the differences between Mindfulness and Self-monitoring
Clinicians$Difference <- Clinicians$Mindfulness - Clinicians$Selfmonitoring
# Perform Shapiro-Wilk test for normality of the differences
shapiro_test <- shapiro.test(Clinicians$Difference)
# Print the results of the normality test
print(shapiro_test)

# Shapiro-Wilk Test for Mindfulness
shapiro_test_mindfulness <- shapiro.test(Clinicians$Mindfulness)
print(shapiro_test_mindfulness)

# Shapiro-Wilk Test for Self-monitoring
shapiro_test_selfmonitoring <- shapiro.test(Clinicians$Selfmonitoring)
print(shapiro_test_selfmonitoring)

#boxplot normality
# Load necessary library
library(ggplot2)

# Create a data frame for plotting
data_long <- data.frame(
  Condition = rep(c("Mindfulness", "Selfmonitoring"), each = nrow(Clinicians)),
  Rating = c(Clinicians$Mindfulness, Clinicians$Selfmonitoring)
)

# Create a boxplot to compare Mindfulness and Self-monitoring
ggplot(data_long, aes(x = Condition, y = Rating, fill = Condition)) +
  geom_boxplot() +
  theme_minimal() +
  labs(title = "Comparison of Mindfulness and Self-monitoring Ratings",
       x = "Condition",
       y = "Rating") +
  scale_fill_manual(values = c("black", "grey"))

#histogram
# Create a histogram for Mindfulness and Self-monitoring ratings
ggplot(data_long, aes(x = Rating, fill = Condition)) +
  geom_histogram(position = "dodge", bins = 15) +
  theme_minimal() +
  labs(title = "Histograms of Mindfulness and Selfmonitoring Ratings",
       x = "Rating",
       y = "Count") +
  scale_fill_manual(values = c("skyblue", "orange"))

#homogeneity of variance
library(car)
# Load the necessary library
# Ensure the 'Condition' variable is a factor
data_long$Condition <- as.factor(data_long$Condition)

# Perform Levene's test for homogeneity of variances
```

```
levene_test <- leveneTest(Rating ~ Condition, data = data_long)

# Print the results of the Levene's test
print(levene_test)

# Scatter plot for visual inspection
plot(Clinicians$Mindfulness, Clinicians$Selfmonitoring,
    xlab = "Mindfulness", ylab = "Selfmonitoring",
    main = "Scatter Plot: Mindfulness vs Selfmonitoring")
abline(lm(Clinicians$Selfmonitoring ~ Clinicians$Mindfulness), col = "red")

# Scatter plot for visual inspection
plot(Clinicians$Mindfulness, Clinicians$Selfmonitoring,
    xlab = "Mindfulness", ylab = "Selfmonitoring",
    main = "Scatter Plot: Mindfulness vs Selfmonitoring")

# Add a regression line to the plot
abline(lm(Clinicians$Selfmonitoring ~ Clinicians$Mindfulness), col = "red")

#outliers
# Boxplot to check for outliers
boxplot(Clinicians$Mindfulness, main = "Boxplot for Mindfulness",
        ylab = "Mindfulness", col = "lightblue")

boxplot(Clinicians$Selfmonitoring, main = "Boxplot for Selfmonitoring",
        ylab = "Selfmonitoring", col = "lightgreen")

# Calculate Z-scores for Mindfulness and Self-monitoring
z_scores_mindfulness <- scale(Clinicians$Mindfulness)
z_scores_selfmonitoring <- scale(Clinicians$Selfmonitoring)

# Identify outliers (Z-scores > 3 or < -3)
outliers_mindfulness <- which(abs(z_scores_mindfulness) > 3)
outliers_selfmonitoring <- which(abs(z_scores_selfmonitoring) > 3)

# Print the outlier indices
print("Outliers in Mindfulness:")
print(outliers_mindfulness)

# Histogram for Mindfulness and Self-monitoring
hist(Clinicians$Mindfulness, main = "Histogram for Mindfulness",
    xlab = "Mindfulness", col = "lightblue", breaks = 10)

hist(Clinicians$Self.monitoring, main = "Histogram for Selfmonitoring",
    xlab = "Selfmonitoring", col = "lightgreen", breaks = 10)


print("Outliers in Self-monitoring:")
print(outliers_selfmonitoring)

# Boxplot to visually inspect for outliers in Mindfulness and Self-monitoring
```

```
boxplot(Clinicians$Mindfulness, main = "Boxplot for Mindfulness",
        ylab = "Mindfulness", col = "lightblue")

boxplot(Clinicians$Self.monitoring, main = "Boxplot for Selfmonitoring",
        ylab = "Selfmonitoring", col = "lightgreen")

# Check the column names of your dataset
colnames(Clinicians)


# Load the necessary package
library(car)

# Perform Levene's test for homogeneity of variance
levene_test_result <- leveneTest(Mindfulness ~ Selfmonitoring, data = Clinicians)

# Print the result
print(levene_test_result)


#homogeneity of variance - levine test
# Ensure that the 'Condition' variable is a factor
Clinicians$Condition <- factor(rep(c("Mindfulness", "Selfmonitoring"),
                                   times = nrow(Clinicians) / 2))  # Adjust the number of repetitions based
on your dataset

# Perform Levene's test for homogeneity of variances
library(car)
levene_test <- leveneTest(Mindfulness ~ Condition, data = Clinicians)

# Print the results of the Levene's test
print(levene_test)

levene_test2 <- leveneTest(Selfmonitoring ~ Condition, data = Clinicians)

# Print the results of the Levene's test
print(levene_test2)

# Ensure the 'Condition' variable is correctly assigned (alternating Mindfulness and
Selfmonitoring)
Clinicians$Condition <- rep(c("Mindfulness", "Selfmonitoring"), length.out =
nrow(Clinicians))

# Check the structure of the dataset to ensure the data is set correctly
str(Clinicians)

# Perform Levene's Test for homogeneity of variances for both variables
library(car)

# Levene's test for Mindfulness
levene_test_mindfulness <- leveneTest(Mindfulness ~ Condition, data = Clinicians)
```

```
print(levene_test_mindfulness)

# Levene's test for Selfmonitoring
levene_test_selfmonitoring <- leveneTest(Selfmonitoring ~ Condition, data = Clinicians)
print(levene_test_selfmonitoring)

# Load necessary library
library(car)

# Perform Levene's Test for homogeneity of variances
# Levene's test on Mindfulness and Selfmonitoring

levene_test <- leveneTest(cbind(Mindfulness, Selfmonitoring) ~ 1, data = Clinicians)
print(levene_test)
```