Assessment and psychological treatment of depression in older adults

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Abstract

Depression is one of the leading causes of disability in older adults worldwide. Many older adults with depression are undetected, and there is a need for brief, scalable psychological treatments for depression that can be delivered remotely.

The aims of this thesis were 1) to investigate the diagnostic accuracy of two rating scales (PHQ-9 and GDS-15) for the detection of depression in older adults, and 2) to investigate the feasibility, preliminary efficacy and patients’ experiences of a telephone-based psychological intervention, Behavioral activation with mental imagery (BA-MI), for the treatment of depression in older adults in the context of the covid-19 pandemic.

Study I showed that a cutoff of ≥6 on the GDS-15 and ≥5 on the PHQ-9 were optimal to identify major depressive disorder. When identifying both major depressive disorder and subthreshold depression, the optimal cutoff on the GDS-15 was ≥5. Study II was a randomized clinical pilot trial, CoviDep, with a treatment group receiving the BA-MI intervention, and a control group. The drop-out rate was low. Compared to the control group, the treatment group reported a decrease in depressive symptoms throughout the treatment, with a large effect-size at posttreatment. Study III was a long-term follow-up of participants in CoviDep that received the BA-MI intervention. The drop-out rate over time was low, and compared to baseline, decreases in depressive symptoms were observed with a medium effect-size at posttreatment that was maintained 1- and 3 months post-treatment but lower after 6 months. Study IV was a qualitative study. The BA-MI intervention in CoviDep was described as increasing activities and improving mood. Telephone-delivery reduced barriers due to pandemic restrictions but felt less personal and lacking non-verbal communication. Being recognized and talking to a therapist every week was healing, but the manualized mode of treatment seemed to impair the relationship.

In sum, this thesis shows that both the GDS-15 and the PHQ-9 are useful tools for the detection of depression in older adults, and adds to the support for telephone-delivered BA for the treatment of depression and indicates that MI-interventions are feasible as an augmentation of BA in older adults.

Keywords: Aging, geriatric, late life, cbt, screening

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Till Lina, Elma och Alvar. Ni är det mest meningsfulla, lustfyllda och viktiga i mitt liv.
List of Papers

This thesis is based on the following papers, which are referred to in the text by their Roman numerals.


IV. Pellas J., Damberg M., Renner F., Ji J.L., & Kivi M. Not the same, but similar: a qualitative study of older adults’ experiences of a telephone-based psychological treatment for depression during the covid-19 pandemic. *Submitted manuscript*
Contents

1. Introduction ................................................................................................................. 11
   1.1 Preface ................................................................................................................. 11
       1.1.1 Who is the “older adult,” and why do we need studies specifically for older adults? ................................................................. 12
   1.2 Depression ........................................................................................................... 13
       1.2.1 What is depression? ..................................................................................... 13
       1.2.2 Is depression different in older adults compared with middle-aged and younger adults? ............................................................... 16
       1.2.3 What causes depression in older adults? ................................................... 16
       1.2.4 How common is depression among older adults? ................................... 17
       1.2.5 Was the prevalence of depression in older adults affected by the Covid-19 pandemic? ................................................................. 18
   1.3 Assessment and diagnosis of depression in older adults ........................................ 19
       1.3.1 About diagnostic accuracy ......................................................................... 20
       1.3.2 Rating scales for depression in older adults ................................................. 21
   1.4 Treatments for depression in older adults ............................................................. 22
   1.5 Behavioral activation ............................................................................................ 23
       1.5.1 Behavioral activation for depression in older adults .................................. 25
       1.5.2 Behavioral activation delivered via telehealth ............................................. 26
   1.6 Mental imagery ...................................................................................................... 27
       1.6.1 Mental imagery, depression, and behavioral activation .............................. 27
   1.7 Rationale ................................................................................................................. 28

2. Aims .............................................................................................................................. 30
   Study I ......................................................................................................................... 30
   Study II ........................................................................................................................ 30
   Study III ....................................................................................................................... 30
   Study IV ....................................................................................................................... 30

3. Methods ......................................................................................................................... 31
   3.1 Study design and settings ...................................................................................... 31
   3.2 Participants ............................................................................................................. 33
   3.3 Measures ................................................................................................................. 36
       3.3.1 Self-rating scales .......................................................................................... 36
       3.3.2 Structured clinical interview ........................................................................ 37
       3.3.3 Neuropsychological screening .................................................................... 37
Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANOVA</td>
<td>Analysis of variance</td>
</tr>
<tr>
<td>BA</td>
<td>Behavioral activation</td>
</tr>
<tr>
<td>BADS-SF</td>
<td>Behavioral activation for depression scale - short form</td>
</tr>
<tr>
<td>BA-MI</td>
<td>Behavioral activation with mental imagery</td>
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<tr>
<td>CBT</td>
<td>Cognitive behavioral therapy</td>
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<tr>
<td>CI</td>
<td>Confidence interval</td>
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<tr>
<td>Covid-19</td>
<td>Coronavirus disease 2019</td>
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<td>ES</td>
<td>Effect size</td>
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<td>GAD-7</td>
<td>Generalized anxiety disorder 7-item scale</td>
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<tr>
<td>GDS-15</td>
<td>Geriatric Depression Scale 15-item</td>
</tr>
<tr>
<td>MADRS-S</td>
<td>Montgomery–Åsberg depression rating scale – self-rating</td>
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<tr>
<td>MDD</td>
<td>Major depressive disorder</td>
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<td>MDE</td>
<td>Major depressive episode</td>
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<tr>
<td>MI</td>
<td>Mental imagery</td>
</tr>
<tr>
<td>MINI</td>
<td>Mini International Neuropsychiatric Interview</td>
</tr>
<tr>
<td>MMSE-SR</td>
<td>Mini-Mental State Examination – Swedish revision</td>
</tr>
<tr>
<td>NEQ</td>
<td>Negative effects questionnaire</td>
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<tr>
<td>PHQ-9</td>
<td>Patient health questionnaire 9-item</td>
</tr>
<tr>
<td>PLLAT</td>
<td>Psychiatric Syndromes in Later Life – Assessment and Treatment</td>
</tr>
<tr>
<td>Psi-Q</td>
<td>Plymouth sensory imagery questionnaire</td>
</tr>
<tr>
<td>RCT</td>
<td>Randomized controlled-clinical trial</td>
</tr>
<tr>
<td>SD</td>
<td>Standard deviation</td>
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<tr>
<td>TA</td>
<td>Thematic analysis</td>
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<td>TAU</td>
<td>Treatment as usual</td>
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<tr>
<td>WHODAS</td>
<td>WHO disability assessment schedule</td>
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</table>
1. Introduction

1.1 Preface
The Swedish poet and psychologist Thomas Tranströmer wrote (1):

“I carry inside myself my earlier faces, as a tree contains its rings. The sum of them is me. The mirror sees only my latest face, while I know all my previous ones.”

For me, this quote captures the essence of why I have chosen to work with older adults. For, although the person sitting in front of you may be 80 years old in the present moment, you are invited to take part in life experiences from when this person was 20, 40, and 60, and also the wisdom that is derived from those experiences. When working with psychological treatment, previous experiences are resources to build upon, making it interesting and rewarding to work as a psychologist with older adults. So, when I enrolled as a Ph.D. student in 2018, it was clear that my research should involve older adults, and the plan was to write a thesis on assessment and psychological treatment of depression in primary care. However, at the beginning of 2020 when the treatment studies were supposed to start, the SARS-CoV-2 virus spread like wildfire over the globe and within months caused a pandemic of the coronavirus disease 19, Covid-19. Early on during the pandemic, it was clear that Covid-19 had a high death toll, especially among adults aged 70 years and older. As a response, some countries introduced strict quarantine laws, whereas others, such as Sweden, opted for a strategy called social distancing where individuals, especially vulnerable and/or older adults, were urged to limit close contact with others and to stay at home as much as possible. Based on research conducted during and after previous pandemics, it was expected that the societal changes inflicted by the pandemic and pandemic restrictions could have an impact on mental health, particularly among vulnerable groups such as older adults (2), and several renowned mental health experts made a plea for research on methods to tackle an impending mental health crisis. As a result, the initial thesis idea was modified, and instead of researching psychological treatment for depression in older adults conducted face-to-face in primary care, it was shifted to a telephone-delivered psychological treatment, which was possible to conduct during the Covid-19 pandemic. So, to paraphrase the title of Study IV, this thesis is similar to the original idea, but not the same.
However, in a time when the number of older adults is growing in the population and almost one-third of them feel depressed, the change of direction in the thesis may have been for the better—there is an urgent need for effective, scalable psychological treatments that can be delivered remotely, and where the results from this thesis might fit, pandemic or not.

1.1.1 Who is the “older adult,” and why do we need studies specifically for older adults?

Almost every time I give lectures about depression in older adults, be it in academic settings, to healthcare professionals, or to the public, someone asks “what do you mean when you say older adults?” This is a highly relevant question, for although most of us can paint a picture of the concept of an “older adult,” it is not necessarily the same picture we envision.

What we mean by the term “older adult” depends both on your previous experiences with adults who are in late adulthood, your so-called preconceptions or stereotypes, and probably also your own age. But it also depends on your stance: Do you mean older adult according to chronology as in years from birth? Or do you mean biological age, such as the body’s physical abilities that inevitably change as we grow older? Or perhaps you mean cognitive age, that is, your mind’s mental abilities, such as memory, which often decline with increasing age? Or are you referring to an individual within a social context: a retiree, a grandmother or grandfather, or someone who experienced the second world war first-hand?

All these stances are correct in their own way and relate to each other—it is more likely that a retiree is above 65 years than below, and it is more likely that someone who is 90 years old has poorer memory and less muscle mass than someone who is 60 years old. However, although these relations are observed on a group level, there is great variability among individuals—for example, in a longitudinal study conducted in northern Sweden by Nyberg and colleagues (3), where individuals were followed for up to 25 years, you could indeed see a decline in memory abilities over time at group level. However, further analyses delineated three different subgroups: one with individuals that maintained their memory ability with increasing age, another that had a gradual decline like the average for the group as a whole, and one group that had a steeper decline than average.

This illustrates what makes aging research both challenging and interesting—how do we, for example, detect and diagnose diseases and disorders in older adults when there is such a great variability between individuals, and how do we design treatments taking this variability into account? This thesis represents a humble effort to do exactly that: to investigate methods for the assessment and treatment of depression in older adults. Answering the frequently asked question: throughout this thesis, the definition of an older adult
is someone who is 65 years old or above. This is in accordance with the official retirement age in Sweden when these research studies were conducted.

1.2 Depression

Depression is one of the leading causes of the global health burden across the entire lifespan (4). Depression in older adults is associated with poorer quality of life (5), functional (6) and cognitive impairment (7), and increased risk of morbidity, especially cardiovascular diseases (8), dementia (9), and mortality (8). In a Swedish case-control study, depression was the strongest risk factor for suicide in older adults (10), underscoring that depression identification and treatment are crucial to prevent suicide (11). Thus, it is of great importance to identify and treat depression, particularly in older adults, both to reduce suffering and functional and cognitive impairment, but also to prevent other disorders and to prevent suicide.

The following introduction answers and discusses several questions: What is depression? Is depression different in older adults compared with middle-aged and younger adults? How common is depression among older adults? Was the prevalence of depression in older adults affected by the Covid-19 pandemic? After that, the assessment, diagnosis, and treatment of depression in older adults will be described and discussed.

1.2.1 What is depression?

Depictions of depression as a recognizable psychological condition can be traced back to the writings of Hippocrates almost 2,500 years ago. Hippocrates described a state called melancholia characterized by “fear or sadness that lasts a long time” with symptoms like “aversion to food, despondency, sleeplessness, irritability, restlessness” that are congruent with our view of depression today (12). Throughout this 2,500-year period of written history, symptoms of depression have been accepted as parts of a palette of normal human feelings and responses but distinguished as abnormal when they are exaggerated considering the circumstances. For example, it has been seen that the loss of a loved one often gives rise to symptoms like depression, but this is also considered a “normal” reaction (12). For the better part of history, the mood condition characterized by sadness has been referred to as melancholia, but in the 1800s, the term “depression” started to appear and subsequently replaced melancholia (13). Today, “depression” or “feeling depressed” are common terms in everyday language describing low mood. The clinical diagnosis of depression is, however, based on a set of criteria regarding the frequency and persistence of symptoms, as well as suffering and disability due to the symptoms (14). The two most widely-used diagnostic nomenclatures for psychiatric disorders are the Diagnostic and Statistical Manual of Mental Disorders,
at present in its fifth edition, DSM-5 (14), and the International Classification of Diseases, ICD, currently in its 11th edition, ICD-11 (15). However, the ICD-11 has not been translated into Swedish, so the ICD-10 is used in Swedish healthcare at present. In DSM-5, depression without other features, such as mania or psychosis, is referred to as Major depressive disorder (MDD) (14).

As seen in Table 1, according to the DSM-5 (14), the diagnosis of MDD is met when an individual describes i) depressed mood, and/or ii) loss of interest or pleasure for the last two weeks, as well as other criteria such as changes in appetite and/or weight, increased or decreased sleep, restlessness or psychomotor slowing, loss of energy or fatigue, feelings of worthlessness or excessive guilt, problems concentrating or making decisions, and recurrent thoughts or behaviors related to death or suicide. Five criteria need to be met, with at least one of (i) or (ii) above, and the symptoms need to cause clinically significant suffering and/or impairment in everyday functioning. In ICD-11, depression is referred to as Depressive disorder (15). The criteria in ICD-11 are similar to DSM-5, with the addition of hopelessness as a symptom criterion (16).

In both DSM-5 and ICD-11, MDD can occur either as a first major depressive episode (MDE) or be recurrent with a history of several MDEs.

Table 1. Diagnostic criteria for major depressive disorder (MDD), adapted from the DSM-5 (14).

<table>
<thead>
<tr>
<th>A</th>
<th>Five or more of the following symptoms have been present for at least two weeks, nearly every day, with at least one of symptoms 1 or 2:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Depressed mood</td>
</tr>
<tr>
<td>2.</td>
<td>Markedly diminished interest or pleasure in activities</td>
</tr>
<tr>
<td>3.</td>
<td>Significant weight loss or weight gain</td>
</tr>
<tr>
<td>4.</td>
<td>Insomnia or hypersomnia</td>
</tr>
<tr>
<td>5.</td>
<td>Psychomotor agitation or psychomotor slowing</td>
</tr>
<tr>
<td>6.</td>
<td>Fatigue or loss of energy</td>
</tr>
<tr>
<td>7.</td>
<td>Feelings of worthlessness or excessive guilt</td>
</tr>
<tr>
<td>8.</td>
<td>Diminished ability to think or concentrate, or indecisiveness</td>
</tr>
<tr>
<td>9.</td>
<td>Recurrent thoughts of death or suicide, suicidal ideation, suicide attempt, or plan for committing suicide</td>
</tr>
<tr>
<td>B</td>
<td>The symptoms cause significant distress or impairment in functioning</td>
</tr>
<tr>
<td>C</td>
<td>The symptoms are not attributable to the physiological effects of a medical condition or substance</td>
</tr>
<tr>
<td>D</td>
<td>The symptoms are not better explained by another psychiatric disorder</td>
</tr>
<tr>
<td>E</td>
<td>There have never been any manic or hypomanic episodes</td>
</tr>
</tbody>
</table>

Both the DSM-5 and the ICD-11 also recognize that individuals not meeting the full criteria for MDD still can experience suffering and impairment, and make it possible to diagnose a subthreshold depressive condition, in DSM-5
called “depressive episodes with insufficient symptoms” under the category Other Specified Depressive Disorders (14), and in ICD-11 grouped in the category “Other Specified Depressive Disorders” (15). In this diagnosis, the individual meets the criteria for depressed mood and/or loss of interest, and one to three of the other symptoms. In both research and clinical practice, there are several terms for depressive disorders not meeting the full criteria for MDD, including minor depression, subclinical depression, subsyndromal depression, or subthreshold depression (17). Previous studies have pointed to the fact that as many as 2–3 times more older individuals compared with younger individuals present with a subthreshold depression rather than meeting the criteria for MDD, and that subthreshold depression is associated with an increased risk of developing MDDs (18). It has also been argued that because of changes due to aging processes, primarily increasing functional disability, fewer symptoms are required to reach clinical significance from a mental disorder, as seen in Figure 1 (19), explaining why more older adults than younger adults may present with subthreshold depression. Furthermore, studies also show that many older adults with subthreshold depression benefit from depression treatment (20), making subthreshold depression important to treat both as a disorder in itself and also to reduce the risk of developing MDD.

There are, however, several problems with this categorical approach to psychiatric diagnoses, highlighted in a paper by Ruggero and colleagues (21). One problem is within-diagnosis heterogeneity, meaning that individuals with the same diagnosis can have little or no overlap of symptoms. Another is the considerable overlap of symptoms between diagnoses, for example between depression and anxiety disorders, questioning their distinctiveness. In addition, it has been proposed that most psychopathology falls along a continuum with normality without sharp boundaries between categories.

Figure 1. The interplay between symptoms and functional disability on the threshold for diagnosis, adapted from Miloyan et al. (19).
1.2.2 Is depression different in older adults compared with middle-aged and younger adults?

Although there is no formal diagnosis specifically for older adults within the depression spectrum in either DSM-5 or ICD-11, the term “late-life depression” is often used to denote depressive disorders in adults aged 65 years and above (22). The question regarding age-related differences in symptom presentation in older adults has been debated for decades, and studies have often shown conflicting results (23). In a meta-analysis by Hegeman and colleagues (24), it was found that older adults with MDD demonstrated more agitation, general and gastrointestinal somatic symptoms, and hypochondriasis, but less guilt and less loss of sexual interest than younger adults. As mentioned previously, subthreshold depression is more common in older adults but with similar functional disability and treatment gains as in MDD, suggesting a difference in presentation with regard to the frequency of symptoms. Another difference that has been suggested depends on the age of onset, that is, if the first depressive episode is early- or late-onset (i.e., before or after the age of 60–65 years). In a systematic review by Grayson and Thomas (25), it was found that individuals with late-onset depression were less likely to report a family history of mood disorders, but no consistent evidence was found for other differences regarding symptoms or clinical outcomes. There is, however, one depression subtype called vascular depression that is more likely to co-occur with older age (26). In vascular depression, cerebrovascular risk factors are found as well as lesions in the brain, inducing disruptions of frontal–subcortical pathways that are hypothesized as involved in mood regulation (26). Although there is no consensus on diagnostic criteria for vascular depression, there are several symptoms and signs that are distinct for this subtype, including psychomotor slowing, cognitive impairment (especially with impaired processing speed and executive functioning), functional disability, apathy and lack of initiative, absence of a family history of depression, and a history of hypertension (26).

1.2.3 What causes depression in older adults?

On a group level, there is no single factor that explains why someone becomes depressed in older age, but rather a set of risk factors that are associated with a higher risk of developing depression (27-29). These risk factors are often grouped into biological, psychological, and social risk factors, but unhealthy lifestyle habits also increase the risk. In Figure 2, the most studied factors are summarized. As seen in the figure, the arrows go both ways to depict that the risk factors are also multidirectional (28), meaning that they are intertwined and may interact and influence each other. For example, if an individual has a hearing impairment, there is a higher risk for social isolation and thereby feelings of loneliness, exacerbating the risk for depression. It is also important to
mention that even though individual studies have found support for the previously described risk factors, studies that investigate the accumulated evidence for each risk factor are less convincing. For example, a recent systematic review found considerable differences in the strength of evidence for several of these factors, as well as conflicting results for several factors (27). Chronic disease, sleeping problems, and sensory and physical impairment were considered strong risk factors, whereas conflicting evidence was found for age, education, female sex, cognitive impairment, alcohol, and smoking, as well as most psychological and social factors. In addition, in a recent umbrella review of meta-analyses, it was concluded that the strongest risk factors were aspirin use, older age (80 years and above), sleep disturbances, sensory impairments (hearing and vision), and cardiac disease (29).

Figure 2. Risk factors associated with depression in older adults.

1.2.4 How common is depression among older adults?
The prevalence rate of depression among older adults differs between countries and between studies, depending on how depression was defined and identified, and depending on which population was studied, for example, if the sample studied was recruited from the community, healthcare environments, or nursing homes.

Depressive disorders (i.e., both MDD and subthreshold conditions) affect around 28% of older adults world-wide (30), and MDD occurs in about 13%
of older adults (31). There is, however, considerable variability between studies and methods, with a prevalence ranging from 5% when using DSM criteria to between 16% and 42% when using rating scales (31).

Several studies regarding the prevalence of depression in older adults have been conducted in Sweden. In a public health report from mid-Sweden conducted in 2022, 33% of the women and 22% of the men 70 years and above reported suffering from depressive symptoms (32). Five percent, of which twice as many were women than men, reported having a clinical diagnosis of depression. In a population-based study of older adults aged 60 years and above, the prevalence of depression was 5.9%, including both minor and major depression (33). A study conducted in Swedish primary care involving participants 60 years and older showed a depression prevalence of 15% (34). Lastly, the prevalence of depression in older adults living in long-term care is around 55% (35), bearing in mind that around two-thirds also had cognitive impairments at different levels.

1.2.5 Was the prevalence of depression in older adults affected by the Covid-19 pandemic?

As mentioned earlier, the Covid-19 pandemic and subsequent societal changes, such as lockdowns and recommendations of social distancing, were identified as possible grounds for a perfect storm for increased mental ill health such as depression, particularly in older adults (2). Several studies investigating this topic were conducted across the globe at different stages of the pandemic, and a meta-analysis from 2021 showed that depression rates increased in all age groups compared with prepandemic times (36). The largest systematic review and meta-analysis to date was published in 2023, synthesizing the evidence from high-quality longitudinal studies, that is, studies that compared mental health before and during the pandemic (37). This study could indeed corroborate that depressive symptoms worsened in older adults due to the pandemic, although the increase was small (37).

Three studies were identified that reported prevalence rates of depressive symptoms in older adults in Sweden during the Covid-19 pandemic. All three were cross-sectional and used community samples. The first study was conducted between March and April 2020, with 1,503 adult participants responding to a web-based questionnaire on depression and anxiety (38). One hundred and eighty-nine of the participants were between 60 and 69 years old, and 98 were 70 years old or above. The results showed that in the group of 60–69-year-olds, 13.8% had clinically significant symptoms of depression, and among those aged 70 years or above, the rate was 9.2%. Younger individuals had higher ratings of depression than older individuals. The second study was conducted in Sweden between May and June 2020 (39). In this study, 1,212 adult participants responded to questionnaires concerning mental health and
wellbeing. One hundred-and-one participants were between 61 and 88 years of age. Of the total sample, 30% reported depressive symptoms above the cutoff for suspected clinical depression. As in the previous study, the results from this study also suggested that older individuals were less affected by psychological distress than younger individuals. In a third study, conducted between April and May 2020, 1,854 older adults aged 70 years or above participated by filling out a web-based questionnaire on mental health and compliance with government recommendations (40). The results showed that 38.8% (44.4% of the women and 25.7% of the men) responded that they felt depressed. It is important to note that this study used a single question about depression, “I feel depressed,” and not a validated rating scale for depression. All these cross-sectional studies from Sweden have a common limitation: as they only included data from one point in time and not before the pandemic, it is not possible to draw inferences concerning causality, that is, if the pandemic increased the rates of depressive symptoms.

To sum up, depression in older adults was a major public health concern before the pandemic, and prevalence rates were as high or higher during the pandemic. Thus, it is of great importance to identify, diagnose, and treat depression in older adults, pandemic or not.

1.3 Assessment and diagnosis of depression in older adults

A thorough assessment and diagnosis of depression in older adults requires a comprehensive psychiatric interview with the patient, and, many times, an informant such as a family member, relative, or friend (41). In the psychiatric interview, information is collected regarding past and present symptoms, medications, family history, social history, and functional ability. Mental status examinations, physical examinations, and laboratory studies may be needed to identify underlying medical or neurological conditions. To aid the identification and diagnosis of depression and to monitor the effect of treatment, psychiatric self-rating scales can be used (41, 42). For patients with multimorbidity, frailty, or polypharmacy, a comprehensive geriatric assessment is often needed, where a team of health professionals assesses mood, cognitive and functional ability, fall risk, nutrition, polypharmacy, and social support (42).

However, in everyday clinical practice, the diagnostic assessment varies greatly, especially when time is scarce. In primary care, where most of the older adults with depression are treated, about half of all older adults with depression remain undiagnosed and untreated (43, 44). To increase the likelihood of identifying individuals with MDD, and thus increasing the number of individuals that receive treatment, depression rating scales have been proposed as a diagnostic tool (45).
1.3.1 About diagnostic accuracy

Diagnostic tests, such as psychiatric rating scales, need to have as high a diagnostic accuracy as possible, that is, they should be able to discriminate between individuals with a disorder and individuals without a disorder according to a reference standard or reference test, often referred to as the “gold standard” (46). In psychiatric research, the reference standard often is either a diagnosis made by an expert panel based on a longitudinal assessment of all available information (e.g., longitudinal expert all data procedure, LEAD), or a structured clinical interview such as the Structured Clinical Interview for DSM (SCID) or the Mini International Neuropsychiatric Interview (MINI) (47).

The percentage of correctly identified individuals with the disorder at a given cutoff score is referred to as the sensitivity, and the percentage of correctly identified individuals without the disorder at a given cutoff score is referred to as the specificity (46). As seen in Figure 3, the choice of cutoff value affects the sensitivity and specificity; a lower cutoff value as in example A identifies a larger percentage of individuals with the disorder but also misclassifies a higher percentage of individuals without the disorder, whereas in example B, a higher cutoff value identifies a larger percentage of individuals without the disorder but also misclassifies a higher percentage of individuals with the disorder. The optimal cutoff is a balance between sensitivity and specificity, for example by using Youden’s $J$ index to determine the cutoff score with the highest value combining sensitivity and specificity (46), as in example C. Depending on the setting and type of disorder, there might also be other considerations, for example, cost-effectiveness.
1.3.2 Rating scales for depression in older adults

There are several rating scales designed to identify depression in older adults, as well as depression rating scales for adults in general that have also been evaluated in older adults (48), of which some have been translated into Swedish. Two such scales are the Patient Health Questionnaire, PHQ-9 (49) and the Geriatric Depression Scale 15 item, GDS-15 (50). The Swedish Agency for Health Technology Assessment and Assessment of Social Services recommends the PHQ-9 for adults of all ages (47, 51), and the GDS-15 for older adults in particular (52, 53).

According to a meta-analysis, the PHQ-9 has a sensitivity of 88% and a specificity of 78% using a cutoff score of 10 or above (47). The Swedish version of the PHQ-9 has adequate psychometric properties with regard to internal consistency and factor structure (54), however, there are to the author’s knowledge no studies on the diagnostic accuracy in older adults.
The most recent meta-analysis of the GDS-15 in adults 65 years and above without cognitive impairment showed a sensitivity of 81% and a specificity of 82% using DSM criteria as a reference standard (55). In samples with cognitive impairment, the sensitivity and specificity dropped to 74%–76% and 62% respectively. The optimal cutoff score varied between 4 and 7 in the included studies. In another meta-analysis, the proposed cutoff score from the originator of 6 showed a sensitivity of 89% and a specificity of 77% (56). The Swedish version of the GDS-15 has acceptable internal consistency (57-59) and convergent validity at different levels of cognitive functioning (57). In a study of a psychiatric sample, the sensitivity was 71% and specificity 93% using a cutoff of 9.

1.4 Treatments for depression in older adults

Depression in older adults can be treated with antidepressant medication, physical activity (i.e., exercise interventions), and psychological treatment (42), and these treatments are indeed recommended in guidelines from the Swedish National Board of Health and Welfare regarding the treatment of depression in adults in general (60). In the guidelines, antidepressant medication and psychological treatments are recommended first-hand, and physical activity as an alternative.

Antidepressant medication is superior to placebo as a treatment for depression in adults in general (61). However, in a meta-analysis of antidepressant medication specifically in older adults (62), it was concluded that for MDD, antidepressants may not be superior to a placebo in achieving remission in depression but may be effective in preventing relapse. Antidepressant medication has been associated with adverse effects in older adults, especially fall incidents and hyponatremia (low blood sodium), and has been linked to an increased risk of mortality (63). Common side effects of antidepressant medication include nausea, weight loss, and reduced libido (62). It is therefore advisable to try nonpharmacological treatments, such as psychotherapy, as a first line of treatment, which is also supported by the guidelines from the Swedish National Board of Health and Welfare (60).

Physical activity, that is, exercise interventions, is effective for treating depression in adults (64), and in an umbrella review of meta-analyses investigating exercise interventions for depression in older adults (65), effect-sizes ranged from .14 to .90, with smaller effects seen in studies with persons with dementia. Of note, many studies included in the analyses are small, and there are fewer studies of high quality with a lower risk of bias (64, 65).

Lastly, psychological treatments for depression are effective for the treatment of depression among adults in general, with better effects than antidepressant medications in the long run (66). In a meta-analysis comparing the effect of psychological treatments for depression in different age groups (67),
69 trials of older adults (55–75 years) were included as well as 10 trials in older-old adults (75 years and above). The overall effect size (ES) for older adults was .66, and for “older-old” adults .97, indicating medium and large ESs, respectively. The authors found no differences in ESs when comparing older and older-old adults with middle-aged adults, and the conclusion was that psychological treatments are effective for treating depression in adults, regardless of age.

The guidelines from the Swedish National Board of Health and Welfare (60) recommend three types of psychological treatments for depression in adults: Cognitive behavioral therapy (CBT), Interpersonal therapy, and Short-term psychodynamic therapy, with CBT being the most frequently studied one. CBT can be considered an umbrella term encompassing different types of interventions based on cognitive and behavioral theory, characterized by being structured, time-limited, and goal-directed (68). One intervention within CBT is Behavioral activation (BA), the focus of the treatment intervention in this thesis, which will be discussed in the next chapter.

Thus, both the national guidelines and recent scientific studies conclude that psychological treatments are effective in treating depression in adults in general as well as in older adults and should be considered a first-line treatment. However, only about 3% of the older adults in Sweden with depressive symptoms or depressive disorders report receiving psychological treatments, compared with about 25% who report receiving antidepressant medication (33, 69). Negative attitudes among older adults toward psychotherapy have been proposed as one contributing factor, but drawing on results from studies in other countries, a majority of older adults with depression would prefer nonpharmacological treatment, such as psychological treatment, as a first-line option (70). The low rate of older adults receiving psychological treatment may also be influenced by barriers, such as accessibility or transportation issues, but also by the belief that depressive symptoms are normal in older age (71). Last but not least, the availability of psychological treatment is often low due to relatively few first-line mental health care professionals (e.g., psychologists and psychotherapists), compared with the high prevalence of mental disorders (60). This highlights the need for scalable, time-efficient psychological treatments that may be offered to a larger number of individuals without increasing the workforce.

1.5 Behavioral activation

BA is a brief psychological treatment focusing on increasing engagement in positive and adaptive activities and decreasing engagement in activities that maintain depression and/or increase the risk for depression (72). As can be seen in Figure 4 to the left, a common way of conceptualizing depression in BA is to describe the interplay between negative feelings (e.g., low mood and
diminished interest), a decrease in valued (e.g., important, enjoyable, and/or meaningful) activities that you engaged in before, resulting in a decrease in positive reinforcement and increased negative thoughts. Two core interventions in BA, dating back to the origins of BA in the 1970s and also used in subsequent versions of BA, are activity monitoring and activity scheduling (73). Activity monitoring requires the individual to make registrations of behaviors and mood for a certain time, giving insight into the connection between behavior and mood, and informing the therapist on targets for treatment (72). Activity scheduling, as seen to the right in Figure 4, entails the patient scheduling and performing important, meaningful, and enjoyable activities (68). This leads to an increase in positive reinforcement and positive thoughts, which leads to more positive feelings such as improved mood.

Figure 4. BA model of depression (left) and BA treatment rationale (right), adapted from Dahne et al. (74).

The empirical evidence for using BA as a treatment for depression in adults is extensive; a recent meta-analysis investigated the effect of BA delivered in an individual format for the treatment of depression in adults (73) and found a large effect favoring BA compared with control conditions (Hedge’s $g = .85$). The number of sessions ranged from 1 to 24, with the majority between 4 and 12 sessions. There are several advantages of BA compared with other evidence-based psychological treatments for depression. First, BA is briefer, that is, delivered in fewer sessions, making it cost-effective (75). Second, as BA is manual-based and rather straightforward, it can be delivered successfully by health care professionals without formal training in psychological treatment (75), increasing availability. Third, as will be discussed further on, BA can be delivered remotely using telehealth, increasing accessibility.

Apart from showing that BA works as a treatment for depression, it is also of interest to investigate how it works. To answer that question, Janssen and colleagues synthesized the evidence on potential mediators for the treatment effect of BA (76). The results showed that self-rated activation yielded conflicting results in the included studies, with significant results in studies of low
quality but nonsignificant results in studies of high quality. Environmental reward (i.e., a state where a person experiences a sense of mastery or pleasure because of their activity) was significant, but it could not be substantiated that changes in environmental reward preceded a change in depressive symptoms, so no firm conclusions could be drawn. Two high-quality studies found significant effects of treatment fidelity, belief in one’s own coping capabilities (i.e., self-efficacy) and taking credit for the improvements. These mediators are rather generic, or, as the authors put it, “might BA be effective ‘merely’ because people attend sessions and start believing in their own capabilities?” The authors also looked beyond BA theory and found some evidence from neurobiological studies that reward motivation, that is, viewing the future as rewarding, could be a potential mechanism of BA, rather than the reward experience itself. Put simply, depressed individuals may underestimate the pleasure they will experience from an activity and thereby feel less motivated, but still feel pleasure when the activity is performed. Janssen and colleagues conclude that the process of mediation is too complex to investigate with the designs used, and that future studies should include information not just on a group level but also on an individual level, as well as include neurobiological parameters.

1.5.1 Behavioral activation for depression in older adults

While the previously mentioned meta-analysis showed that BA is effective in treating depression in adults in general (73), fewer studies have examined the effect of BA on depression in older adults. In a meta-analysis by Orgeta and colleagues, the results showed that BA is effective as a stand-alone treatment for depression in older adults (77), with an ES of .72 posttreatment, .44 at 3–6 months posttreatment, and .30 at 8–12 months posttreatment. After this meta-analysis, additional studies have been published. Funderburk and colleagues conducted a pilot trial of a four-session BA intervention for primary care (78), followed by a full-scale multicenter randomized clinical trial (RCT) of this intervention (79). The pilot trial demonstrated feasibility and acceptability, and a reduction in depressive symptoms (78). In the RCT, the BA intervention led to a faster reduction in depressive symptoms than treatment as usual (TAU), although after 3 months there were no differences in depressive symptoms, but there were statistically significant improvements in quality of life and mental health functioning in the group receiving BA (79). The studies were conducted in veterans and the mean age was 58 years in the pilot and 53 years in the RCT, so the generalizability to older adults in general is limited. More recently, Janssen and colleagues conducted a cluster-randomized RCT of BA for depression in older adults in primary care (80). The intervention consisted of eight weekly sessions of BA face-to-face, performed by mental health nurses, whereas the control group received TAU. BA led to a greater decrease in depressive symptoms in the treatment group compared with the
control group postintervention (between-group ES, $d = .90$) and after 3 months ($d = .50$), but there were no statistically significant differences after 6 ($d = .24$), 9 ($d = .17$), or 12 months ($d = .29$).

1.5.2 Behavioral activation delivered via telehealth

As mentioned earlier, common barriers to psychological treatment may be low availability, accessibility, or transportation issues, and these barriers were likely more pronounced during the Covid-19 pandemic, with the recommendations on physical distancing for older adults. Telehealth interventions, for example using the Internet, videoconferencing, or telephone as a way of delivering psychological treatment, have been proposed as important ways of overcoming these barriers, and are both feasible and effective in treating depression in older adults (81, 82).

Internet-based BA (iBA) has been tested in several trials and has proven to be an effective treatment for depression in adults (83). In a study by Araya and colleagues with a total sample of 440 participants, 323 were 61 years or older (84). The results showed a significant but small effect on depressive symptoms 3 months after the intervention, however, this effect was not maintained after 6 months. One issue with iBA at this point is that 45% of all adults in Sweden born in the 1920s–1930s and 15% of all adults born in the 1940s do not have access to the Internet, and for those who do, only 13%–16% reported using web-based applications for healthcare visits in 2022 (85).

BA via videoconferencing is effective in treating MDD in older adults and non-inferior to face-to-face BA (86-88), but like iBA, videoconferencing requires technical equipment (e.g., smartphone) and skills to be implemented.

Telephone-based BA is a feasible option because practically everyone in Sweden has access to telephones, and could be a viable mode of delivery when there are barriers such as a lack of technical equipment or technical skills. BA via telephone has, to date, been investigated in pilot studies and in clinical trials with smaller sample sizes. In one pilot study, Gum and colleagues showed that a four-session BA treatment with one face-to-face meeting and the rest via telephone was feasible and produced a large effect on depressive symptoms in older adults ($d = 1.03$) (89). It is important to note that the study had only 14 participants that completed the intervention, and no control group. In a subsequent pilot study, Gum and colleagues investigated a stepped telephone-based BA intervention for older adults with depression (90). The intervention was three-tiered, consisting of (i) two calls, (ii) one face-to-face visit followed by two calls, and (iii) one to six calls. In addition, this trial yielded large ESs both posttreatment ($d = 1.3$) and after 3 months ($d = 2.25$), but this study was also small (n = 15) and had no control group. Gilbody and colleagues conducted a pilot trial of telephone-based BA in older adults during the Covid-19 pandemic (91). The participants had long-term health conditions making them especially vulnerable to social isolation due to the restrictions.
The participants were randomized to either a treatment condition with remotely delivered BA (n = 47) or a control group receiving primary care as usual (n = 49). The BA intervention consisted of up to 8 sessions over a 4–6-week period. The results showed preliminary evidence for a reduction in depressive symptoms and loneliness 3 months postintervention, and that the intervention was feasible. It is important to note that most of the participants in the study had low levels of depressive symptoms at baseline, most of them below the cutoff point for suspected depression. In an extension of the pilot study, a qualitative study was performed with sixteen participants and nine support workers (92). The results showed that the intervention was understood and perceived to be useful by participants with low mood, and that they valued the social contact and making changes, although the pandemic limited activity planning. Both participants and support workers reported that self-efficacy developed over time and with experience.

However, one major difficulty in depression treatment is that depression often is accompanied by a lack of energy and low motivation, which make it difficult to engage in activities. For this purpose, adding interventions based on mental imagery (MI) is hypothesized as a way of increasing motivation.

1.6 Mental imagery
MI is defined as “representations and the accompanying experience of sensory information without a direct external stimulus” (93), for example, seeing something in your mind’s eye or hearing something in your mind’s ear. MI allows us to simulate both past and future activities and events, and vivid MI can evoke emotional and physiological experiences as if the events were taking place here and now (94). Future-directed MI, called prospective MI, makes us pre-experience what different behaviors might lead to in terms of both positive and negative emotional consequences (94). The ability to engage in MI differs between individuals, and some individuals seem to lack this ability, known as aphantasia (95). Studies also suggest that on a group level, the vividness of visual MI may decrease with age (95).

1.6.1 Mental imagery, depression, and behavioral activation
In a review article by Ji and colleagues (96), several connections between depression and MI are proposed: first, depression is associated with an increase in emotionally distressing MI and a reduction in positive MI. Second, depression is associated with a reduced vividness for positive MI, but not for negative MI. Third, patients with depression often experience spontaneous unwanted and aversive past and future MI.

Renner and colleagues describe how negative MI in depression contributes to a vicious cycle (Figure 5, left), where reduced reward anticipation leads to
reduced reward-motivated behavior and, in turn, to fewer reward experiences and negative mood. By interventions aimed at increasing positive MI, the cycle may be reversed (Figure 5, right), with increased reward anticipation leading to increased reward-motivated behavior, which then may lead to more reward experiences, positive mood, and fewer depressive symptoms.

Figure 5. The cycle of negative mental imagery in depression (left) and the cycle of positive mental imagery (right), adapted from Renner et al. (94).

Positive MI has been suggested to increase reward anticipation and thereby increase reward-motivated behavior (94), for example by imagining the scheduled activities in vivid detail including the positive emotions and rewards associated with the activity. The combination of MI and BA has been investigated in a nonclinical sample, showing that the addition of MI to BA increased anticipated reward and increased motivation to perform planned activities, acting like a “motivational amplifier” (97). Combining BA with MI fits well with the previously mentioned review by Janssen and colleagues (76), suggesting that one potential mechanism of BA might be reward motivation, that is, viewing the future as rewarding, rather than the reward experience itself. Although one study has shown that MI interventions are feasible also for older adults (98), larger studies are lacking, as well as studies on MI interventions in older adults with depression as well as the combination of BA and MI for older adults.

1.7 Rationale
Depression is a common and debilitating disorder in older adults, and there is a need for research on ways to identify, diagnose, and treat depression. Psychiatric rating scales, such as the GDS-15 and PHQ-9, are effective tools to aid in the identification of depression in older adults. Although international studies exist, there are, to the author’s knowledge, no studies on the diagnostic accuracy in community samples in Sweden. In addition, there are no studies evaluating the diagnostic accuracy of the Swedish PHQ-9 or GDS-
15 for older adults using a structured clinical interview as a reference test, and no studies comparing the diagnostic accuracy of the two scales.

Psychological treatments are effective in treating depression in older adults. However, there is a need for research on effective, brief, and scalable psychological treatments that can be delivered remotely, and that may be implemented with as few barriers as possible. This need was even more highlighted during the Covid-19 pandemic, with pandemic restrictions such as social distancing. This thesis investigates the feasibility, effect, and patient experiences of a telephone-based behavioral activation with mental imagery (BA-MI) intervention for the treatment of depression in older adults within the CoviDep trial.
2. Aims

The overarching aims of the thesis are 1) to investigate the diagnostic accuracy of rating scales (PHQ-9 and GDS-15) for the detection of depression in older adults, and 2) to evaluate the feasibility, preliminary efficacy, and patients’ experiences of a telephone-based psychological intervention (BA-MI) for the treatment of depressive symptoms in older adults. The specific aims for each study are as follows:

Study I
To evaluate the diagnostic accuracy at different cutoff values for the Swedish GDS-15 and PHQ-9 compared with a structured clinical interview in older adults.

Study II
To investigate the feasibility and preliminary efficacy of a brief telephone-delivered BA-MI intervention for the treatment of depressive symptoms in individuals 65 years and older in isolation during the Covid-19 pandemic.

Study III
To investigate the feasibility of long-term follow-ups at 1-, 3-, and 6-months after the BA-MI intervention, and to assess depressive symptoms at 1-, 3-, and 6-months postintervention.

Study IV
To investigate the patients’ experiences of the telephone-based BA-MI intervention during the Covid-19 pandemic.
3. Methods

As mentioned previously, this thesis is a compilation of four studies. An overview of the research methods in each study is presented in Table 2.

3.1 Study design and settings

Study I was a cross-sectional diagnostic accuracy study. Study II was a pilot RCT with two arms: 1) the BA-MI intervention and 2) an attention/assessment control condition. Study III was a single-group pretest–posttest design investigating the feasibility of long-term follow-ups by calculating the retention rates at postintervention and 1-, 3-, and 6-months postintervention, and the long-term effects on depressive symptoms. Study IV was a qualitative study with a descriptive phenomenological approach (99) based on individual interviews.

It is important to note that the initial, preregistered plan for Study II was to conduct a full-scale trial, but due to changes in self-isolation restrictions for older individuals in Sweden from October 22, 2020, the recruitment had to be terminated early and results reported as a pilot trial. About half of the participants completed the study with heavier restrictions concerning social distancing and self-isolation.
Table 2. Overview of methods.

<table>
<thead>
<tr>
<th></th>
<th>Study I</th>
<th>Study II</th>
<th>Study III</th>
<th>Study IV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design</strong></td>
<td>Cross-sectional</td>
<td>Randomized controlled clinical trial</td>
<td>Singe-group pre-test–posttest</td>
<td>Qualitative</td>
</tr>
<tr>
<td><strong>Participants</strong></td>
<td>N=113 adults ≥65 years</td>
<td>N=41 adults ≥65 years with clinically significant depressive symptoms</td>
<td>N=38 adults ≥65 years with clinically significant depressive symptoms from Study II</td>
<td>N=14 adults ≥65 years that had received treatment in Studies II and III</td>
</tr>
<tr>
<td><strong>Data collection</strong></td>
<td>Self-ratings with the PHQ-9 and GDS-15; structured clinical interviews by a psychologist using MINI</td>
<td>Self-ratings of depressive symptoms measured at baseline, weekly, and postintervention; anxiety, functional ability, behavioral activation, and visual mental imagery at baseline and postintervention; depression diagnoses measured via structured clinical interviews by a psychologist using MINI; satisfaction and negative effects measured postintervention for the treatment group</td>
<td>Self-rated depressive symptoms measured at baseline, postintervention, and 1-, 3-, and 6-months postintervention</td>
<td>Semi-structured interviews performed over the telephone</td>
</tr>
<tr>
<td><strong>Analyses</strong></td>
<td>The area under the curve; sensitivity and specificity; Youden’s J index</td>
<td>Repeated-measures ANOVA; between-group ES (Hedge’s g) postintervention; Fisher’s exact test</td>
<td>Within-group ES (Hedge’s g) at postintervention and 1-, 3-, and 6-months postintervention compared with baseline</td>
<td>Inductive thematic analysis based on descriptive phenomenology</td>
</tr>
</tbody>
</table>
3.2 Participants

Study I included a pooled sample from two trials: the CoviDep trial (see below for more details on this trial), and a previous trial evaluating psychiatric rating scales for older adults, the Psychiatric Syndromes in Later Life – Assessment and Treatment (PLLAT) trial, see Figure 6 for participant flow for Study I.

Studies II–IV are all based on the CoviDep trial:

Study II divided participants into a treatment condition that received the BA-MI intervention, and a control condition that received treatment after four weeks, see Figure 7 for participant flow.

Study III included all participants who received the BA-MI intervention (i.e., both the treatment condition and the control condition that also received treatment after four weeks), see Figure 7 for participant flow.

Study IV included 14 participants who had received treatment, sampled to represent maximum variation (100) with regard to sex, age, and living conditions (urban/rural).

Table 3 shows participant characteristics for each study.

The CoviDep trial (Studies I–IV) recruited participants through advertisements in local newspapers and in primary care centers. The inclusion criteria were: 65 years of age or older; clinically significant depressive symptoms as defined by scores above 12 on the Montgomery–Åsberg depression rating scale – self-rating, MADRS-S (101), and/or scores above 9 on the PHQ-9 (49), and/or scores above 5 on the GDS-15 (50), and/or via structured clinical interviews with the MINI (102); telephone access; fluent in written and spoken Swedish; resident in the County of Västmanland; and willing to participate in the trial. Exclusion criteria were severe depression (defined by clinical diagnosis); elevated suicide risk; current substance use disorder; previous or current manic/hypomanic episodes; current psychotic disorder; current diagnosis of dementia/major neurocognitive disorder; currently receiving psychological therapy; or undergoing pharmacological treatment for depression that commenced less than 1 month ago.

The PLLAT trial (Study I) recruited participants from organizations for senior citizens in the County of Västmanland. The inclusion criteria were: 65 years of age or older, fluent in written and spoken Swedish, and willing to participate in the trial. The exclusion criteria were the same as for the CoviDep trial, with the addition of a lower limit of 25 points on the cognitive screening test Mini-Mental State Examination – Swedish revision (MMSE-SR) (103).
Figure 6. Participant flow for Study I.
Figure 7. Participant flow for Studies II and III. Study II divided participants into a treatment condition and a control condition. Study III included all participants who received treatment (i.e., both the treatment condition and the control condition that also received treatment after four weeks).
Table 3. Participant characteristics.

<table>
<thead>
<tr>
<th>Study</th>
<th>Total sample (n=113)</th>
<th>Treatment (n=20)</th>
<th>Control (n=20)</th>
<th>Total sample (n=38)</th>
<th>Total sample (n=14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean (SD)</td>
<td>75.65 (6.1)</td>
<td>75.95 (8.16)</td>
<td>75.15 (6.20)</td>
<td>75.39 (7.21)</td>
<td>73.71 (5.28)</td>
</tr>
<tr>
<td>Women, n (%)</td>
<td>83 (73.5)</td>
<td>16 (80)</td>
<td>17 (85)</td>
<td>32 (84)</td>
<td>11 (79)</td>
</tr>
<tr>
<td>MDE, n (%)</td>
<td>17 (15)</td>
<td>16 (80)</td>
<td>14 (70)</td>
<td>29 (76)</td>
<td>11 (79)</td>
</tr>
</tbody>
</table>

Abbreviations. SD = Standard deviation; MDE = Current major depressive episode

3.3 Measures

3.3.1 Self-rating scales

The self-rating scales described below are shown in the appendix.

Depressive symptoms

In Studies II and III, the primary outcome measure was depression severity measured using the MADRS-S (101). The MADRS-S consists of nine items, capturing the severity of depressive symptoms over the past two weeks. Secondary outcome measures in study II were the GDS-15, a 15-item questionnaire designed for identification of depression in older individuals, with scores ranging from 0 to 15 (50), and the PHQ-9, a nine-item questionnaire designed for identification of depression as well as measuring depression severity in adults with scores ranging from 0 to 27 (49). The GDS-15 and PHQ-9 were also used in Study I.

Anxiety symptoms

In Study II, anxiety symptoms were assessed with the Generalized anxiety disorder 7-item scale (GAD-7), a questionnaire with seven items used to measure general anxiety (104).

Behavioral activation

In Study II, self-rated avoidance and activation were measured using the Behavioral activation for depression scale – short form (BADS-SF) (105), a 9-item scale with scores ranging from 0 to 54, with higher scores indicating a higher degree of activation and lower degree of avoidance.
Functional disability
In Study II, functional disability was assessed with the WHO disability assessment schedule 12-item version (WHODAS-12), a self-rating scale assessing functional impairment (106).

Visual mental imagery
In Study II, MI ability was measured using the Plymouth sensory imagery questionnaire (Psi-Q), a 35-item questionnaire assessing the vividness of MI (107). In this study, we used only the visual subscale with five items.

Adverse effects
In Study II, adverse effects of the treatment were evaluated with the Negative effects questionnaire (NEQ) - short form, a 20-item questionnaire used to investigate the unwanted effects of psychotherapy (108).

Satisfaction
In Study II, acceptability was investigated with the question “Overall, how satisfied were you with the treatment you received?,” with response alternatives ranging from 1 to 5 representing “very dissatisfied” to “very satisfied,” with 3 representing a neutral alternative, “neither satisfied nor dissatisfied.”

3.3.2 Structured clinical interview
In Studies I and II, the MINI 7.0 was used to investigate the presence of MDEs and other psychiatric disorders. MINI is a structured clinical interview designed to capture the presence/absence of the most common psychiatric diagnoses (102). The MINI has a sensitivity of 95% and a specificity of 84% compared with SCID (47).

3.3.3 Neuropsychological screening
In Study I, participants from the PLLAT trial undertook the MMSE-SR (103), a screening test of global cognitive functioning with scores ranging from 0 to 30, with scores above 24 or 25 often considered as normal when used in community or primary care (109).

3.4 Data collection procedure
Study I
The MINI was used as a reference test to assess the presence/absence of current MDEs, and was performed by a clinical psychologist, either face-to-face at the research clinic (the PLLAT trial) or by telephone (the CoviDep trial).
The PHQ-9 and GDS-15 were either administered and scored by a research nurse (the PLLAT trial) or sent to the participants by mail and scored by a research nurse (the CoviDep trial), making the psychologist blinded to the results when performing the MINI. The MINI was performed within two weeks of the rating scales. For participants from the PLLAT trial, the psychologist also performed the MMSE-SR.

Study II
The structured interviews with MINI were performed by clinical psychologists; all interviews at baseline were conducted by the same psychologist (author), whereas the interviews at postintervention were performed by each participant’s therapist. All rating scales were sent to the participants by mail. The MADRS-S was assessed weekly. Treatment satisfaction and NEQ were assessed at posttreatment. All other measures were assessed at baseline and posttreatment.

Study III
Feasibility of the long-term assessments (1-, 3-, and 6-months postintervention) was assessed with retention rates. The MADRS-S was used to assess depressive symptoms at baseline, at postintervention, and 1-, 3-, and 6-months postintervention. All rating scales were sent to the participants by mail.

Study IV
A semi-structured interview guide was constructed by the authors in Study IV (see Table 4). The interview guide was designed to investigate two broad areas: 1) to explore participants’ experiences of telephone-based BA with MI for depressive symptoms in older adults during the Covid-19 pandemic, and 2) to explore factors that promoted or impeded the interventions. To minimize the risk of biased questions by the interviewer as well as minimizing the risk of answers from the participants being influenced by the previous therapeutic relationship, all interviews were conducted by the psychologists involved as therapists in the study. No patient was interviewed by their own therapist nor by the psychologist performing the initial assessment and inclusion. The interviews were transcribed verbatim and checked for accuracy by the respective interviewer.
Table 4. Interview guide.

- Can you tell me why you signed up for this study?
- How did you experience receiving the treatment via telephone?
- A large part of the treatment was about behavioral activation. How did you experience that?
- You also did exercises involving mental imagery, where you were asked to visualize performing planned activities. How did you experience that?
- During the treatment, written materials were used during the sessions and between sessions. How did you experience:
  - The patient materials, with information about depressive symptoms and information about the treatment?
  - The activity diary, where you were asked to register what you did and how you felt during one week?
  - The activity planning, where you were asked to plan activities and evaluate the activities?
- Have you made any changes in your daily life during the treatment?
- Did you encounter any difficulties during the treatment?
- Was there anything that made it easier to succeed with the treatment?
- Did you achieve your goals with the treatment?
- How has it been since the treatment ended?
- If you could change the treatment, what would you add or take away? Is there anything we could do to improve the treatment?

3.5 Interventions

Studies II–IV are based on the same trial and thus the same intervention.

The treatment intervention was manual-based BA-MI, based on two separate interventions: 1) a four-session brief BA treatment for primary care (BA-PC) published by Funderburk and colleagues focusing on activity monitoring and activity scheduling (78), and 2) a MI script by Renner and colleagues (97) performed in sessions two and three, guiding the participant through a mental simulation of performing one of the planned activities, which involved visualizing themselves engaging in the activity at realistic locations, settings, and times, focusing on the positive aspects of the activity and the potential rewards. The BA-MI manual and patient materials were translated into Swedish by the author and were then reviewed by two senior clinical psychologists and a primary care physician. The BA-MI was adapted to comply with government restrictions due to Covid-19. The session components are described in Table 5.

In Study II, the participants were randomized to either a BA-MI intervention or a control condition.

In Study III, all participants receiving treatment were included, that is, both participants who received the BA-MI intervention after randomization, and
participants in the control condition who received the BA-MI intervention after four weeks.

Table 5. Session components in the treatment intervention.

<table>
<thead>
<tr>
<th>Session</th>
<th>Session components</th>
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</table>
| 1       | Psychoeducation about depression  
          | Treatment rationale for Behavioral activation  
          | Rationale and instructions for activity log  
          | If highly motivated for change, planning of an activity for the coming week |
| 2       | Reviewing the activity log and performed activities  
          | Discussion of life goals and values  
          | Planning of activities aligned with life goals and values for the coming week  
          | Rationale for mental imagery (MI)  
          | MI exercise for one of the planned activities |
| 3       | Reviewing performed activities  
          | Troubleshooting any problems carrying out activities  
          | Planning of activities aligned with life goals and values for the coming week  
          | MI exercise for one of the planned activities |
| 4       | Reviewing performed activities  
          | Troubleshooting any problems carrying out activities  
          | Reviewing treatment  
          | Stressing the importance of continuing to engage in activities aligned with life goals and values  
          | Referral to additional service/s if necessary |

The control condition was four weeks on a waiting list with weekly follow-up calls, referred to as an attention/assessment control condition. A manual for the control group was constructed by the author, which included follow-up on the patient’s psychological symptoms, assessment of suicide risk, and answering practical questions about the study. The therapists were instructed to be supportive, but not to engage in behavioral interventions such as activity planning or problem-solving. After four weeks, the participants underwent a new baseline assessment and, if they still had clinically significant depressive symptoms, were offered the BA-MI intervention.

The treatment manual as well as the manual for the control condition were adapted into a web-based system called Entermedic. A digital checklist inspired by Serfaty and colleagues (110) was also used during the sessions to ensure that the therapists adhered to the manuals.

Five psychologists participated in the study as therapists, of which two were senior licensed psychologists and three were junior psychologists during
their 1-year clinical internship before license. All the therapists had as a minimum basic training in CBT. All therapists attended a one-day training workshop which included information about and practical training in delivering the treatment manual. The therapists had a supervision session with the author every 2 weeks to resolve practical issues and troubleshoot difficult treatment situations.

3.6 Methods of analysis

3.6.1 Statistical analyses
Statistical analyses were performed using IBM SPSS Statistics, versions 24–28. In addition, sensitivity and specificity in Study I were calculated using an online calculator provided by MedCalc (111), and ES in Study II was calculated with an online calculator provided by Social Science Statistics (112).

Descriptive statistics
In Studies I–IV, measures of sample size, central tendency (mean), dispersion (standard deviation, SD), frequency, and percentage were used. Feasibility in Study II was assessed with recruitment and drop-out rates, and in Study III with retention rates.

Area under the curve
The area under the curve (AUC) is an estimation of the general discriminative power of a diagnostic test (46). A perfect diagnostic test has an AUC of 1.0, whereas an AUC of 0.5 is no better than chance in discriminating between groups. AUC was calculated for GDS-15 and PHQ-9 in Study I.

Sensitivity and specificity
Diagnostic accuracy was calculated with sensitivity and specificity for different cutoff values on the PHQ-9 and GDS-15. In Study I, 70% was set as the minimum level of sensitivity and specificity.

Youden’s J index
Optimal cutoff values in study I were determined using Youden’s J index, calculated as sensitivity + specificity – 1 (113). Thus, J can range from 0 to 1, with 1 representing 100% sensitivity and specificity.

Repeated-measures ANOVA
The difference between the treatment condition and control condition in study II on the primary outcome measure MADRS-S (baseline, treatment weeks 1–3, postintervention) was analyzed with a repeated-measures ANOVA, with
condition (treatment vs control) as the between-subject factor and time as the within-subject factor.

**Effect size**
The ES is a standardized metric that shows the magnitude of an effect, regardless of which scale is used to measure a variable and regardless of sample size, and this standardized effect allows researchers to communicate the practical significance of the results (114). In this thesis, between-groups ES posttreatment in Study II as well as within-subjects ES at baseline compared with postintervention and follow-ups at 1-, 3-, and 6-months postintervention in Study III were calculated using Hedge’s $g$. Hedge’s $g$ was chosen because it is suitable for smaller samples as well as when there are differences in sample size between groups (114). The ESs were interpreted in line with the recommendation for gerontological research (115): $.15 = \text{small}, .40 = \text{medium}, \text{and } .75 = \text{large}$.

**3.6.2 Qualitative analysis**
In Study IV, the interviews were analyzed using inductive thematic analysis (TA) with a descriptive phenomenological approach according to Sundler and colleagues (99), see Figure 8 for an overview of the analysis process. The interviews were analyzed by two researchers, the author of this thesis (JP) and one of the assistant supervisors (MK). The analysis process started with the researchers familiarizing themselves with the data by reading the interview texts several times and exploring the experiences described by each participant. In the next step, meanings in these experiences were identified and organized into patterns, and from these patterns, preliminary themes and sub-themes were developed by each researcher independently. The researchers then met to discuss their findings and preliminary themes, followed by additional meetings to redefine, name, and describe the final themes. Thus, several reiterations of the analysis were made, reflecting the dynamic process of developing themes within a more reflexive tradition of TA (116, 117).
3.7 Ethical considerations

All studies followed the Declaration of Helsinki, and all participants provided written informed consent. The PLLAT trial was approved by the Ethical Review Board of Umeå (registration number 2019-00944). The CoviDep trial was approved by the Swedish Ethical Review Authority (registration number 2020-02079) and was also preregistered in Clinicaltrials.gov (ID-number NCT04508868).
4. Results

Study I
The AUC was .97 for the GDS-15 and .95 for the PHQ-9, showing comparable accuracy as screening instruments for older adults with MDEs in Sweden. Youden’s $J$ index, sensitivity, and specificity for different cutoff values are shown in Table 6. A cutoff of $\geq 6$ on the GDS-15 yielded the highest Youden’s $J$ index of .82, with a sensitivity of 94% and a specificity of 88%. A cutoff of $\geq 5$ on the PHQ-9 yielded the highest Youden’s $J$ index of .81, with a sensitivity of 100% and a specificity of 81%. The proposed cutoff from the originators of $\geq 10$ on the PHQ-9 produced an excellent specificity of 95% but a lower sensitivity of 71%, indicating that this cutoff might be too high when applied to older individuals in Sweden in community settings.

Additional analyses
In the analysis in Study I, only individuals with MDEs were included in the depression group, and individuals with subthreshold depression were included in the group without depression. As stated before, it is common that older adults present with subthreshold depression rather than MDD but may benefit from treatment. Hence, it would be of value to investigate the diagnostic accuracy of the GDS-15 in older adults with any depressive disorder (i.e., both MDD and subthreshold depression). A new analysis was performed for the purpose of this thesis, combining individuals with subthreshold depression (n = 9) and MDEs (n = 17), and comparing this group to individuals without any depressive disorder (n = 87). Youden’s $J$ index, sensitivity, and specificity for different cutoff values are shown in Table 7. A cutoff of $\geq 5$ on the GDS-15 yielded the highest Youden’s $J$ index of .80, with a sensitivity of 92% and a specificity of 87%.
Table 6. Sensitivity, specificity, and Youden’s J index for GDS-15 and PHQ-9 at different cutoff values, for the detection of MDEs.

<table>
<thead>
<tr>
<th>Instrument and cutoff</th>
<th>Sensitivity, % (CI)</th>
<th>Specificity, % (CI)</th>
<th>Youden’s J index</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDS-15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥4</td>
<td>100 (80–100)</td>
<td>76 (66–84)</td>
<td>.76</td>
</tr>
<tr>
<td>≥5</td>
<td>100 (80–100)</td>
<td>81 (72–88)</td>
<td>.81</td>
</tr>
<tr>
<td>≥6</td>
<td><strong>94 (71–100)</strong></td>
<td><strong>88 (79–93)</strong></td>
<td><strong>.82</strong></td>
</tr>
<tr>
<td>≥7</td>
<td>88 (64–99)</td>
<td>91 (83–96)</td>
<td>.79</td>
</tr>
<tr>
<td>≥8</td>
<td>82 (57–96)</td>
<td>93 (86–97)</td>
<td>.75</td>
</tr>
<tr>
<td>≥9</td>
<td>71 (44–90)</td>
<td>97 (91–99)</td>
<td>.68</td>
</tr>
<tr>
<td>PHQ-9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥4</td>
<td>100 (80–100)</td>
<td>72 (62–81)</td>
<td>.72</td>
</tr>
<tr>
<td>≥5</td>
<td><strong>100 (80–100)</strong></td>
<td><strong>81 (72–88)</strong></td>
<td><strong>.81</strong></td>
</tr>
<tr>
<td>≥6</td>
<td>88 (64–99)</td>
<td>83 (74–90)</td>
<td>.71</td>
</tr>
<tr>
<td>≥7</td>
<td>88 (64–99)</td>
<td>86 (78–93)</td>
<td>.74</td>
</tr>
<tr>
<td>≥8</td>
<td>88 (64–99)</td>
<td>93 (86–97)</td>
<td>.81</td>
</tr>
<tr>
<td>≥9</td>
<td>82 (57–96)</td>
<td>93 (86–97)</td>
<td>.75</td>
</tr>
</tbody>
</table>

Abbreviations. GDS-15 = Geriatric Depression Rating Scale 15-item short form; PHQ-9 = Patient Health Questionnaire 9; CI = 95% confidence interval.

Note. Bold cutoff values indicate the optimal balance of sensitivity and specificity based on Youden’s index, whereas italicized cutoff values represent the proposed cutoff values.

Table 7. Sensitivity, specificity, and Youden’s J index for GDS-15 at different cutoff values, for the detection of depressive disorders (MDEs and subthreshold depression).

<table>
<thead>
<tr>
<th>Instrument and cutoff</th>
<th>Sensitivity, % (CI)</th>
<th>Specificity, % (CI)</th>
<th>Youden’s J index</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDS-15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥3</td>
<td>100 (87–100)</td>
<td>76 (66–84)</td>
<td>.76</td>
</tr>
<tr>
<td>≥4</td>
<td>96 (80–100)</td>
<td>83 (73–90)</td>
<td>.79</td>
</tr>
<tr>
<td>≥5</td>
<td><strong>92 (75–99)</strong></td>
<td><strong>87 (79–94)</strong></td>
<td><strong>.80</strong></td>
</tr>
<tr>
<td>≥6</td>
<td><strong>81 (61–93)</strong></td>
<td><strong>90 (81–95)</strong></td>
<td><strong>.70</strong></td>
</tr>
</tbody>
</table>

Abbreviations. GDS-15 = Geriatric Depression Rating Scale 15-item short form; CI = 95% confidence interval.

Note. Bold cutoff values indicate the optimal balance of sensitivity and specificity based on Youden’s index, whereas italicized cutoff values represent the proposed cutoff values.

Study II

The drop-out rate was 7.3%. The results of a repeated-measures ANOVA revealed that there was a statistically significant Condition × Time interaction for depressive symptoms ($F [2.30, 73.64] = 3.71, p = .024, \eta^2 = .10$), indicating
a decrease in depressive symptoms in the treatment group compared with the control group, see Figure 9.

A large between-group ES was demonstrated at posttreatment for the primary outcome measure depressive symptoms measured with MADRS-S ($g = .85$). For the secondary outcomes, large ESs were demonstrated for behavioral activation (BADS-SF, $g = 1.08$) and for visual MI (Psi-Q, $g = .81$); medium for depressive symptoms with secondary measures (GDS-15, $g = .69$; PHQ-9, $g = .58$) and anxiety (GAD-7, $g = .63$); and small for functional ability (WHODAS-12, $g = .28$).

At posttreatment, 2 out of 16 participants in the treatment condition met diagnostic criteria for depression compared with 9 out of 13 in the control condition, this was however not statistically significant according to Fisher’s exact test (two-tail, $p = .073$).

Adverse effects of the treatment were reported by 21%, the most frequent adverse effects being increased anxiety, more unpleasant feelings, that unpleasant memories resurfaced, that they did not always understand their treatments, that the treatment did not produce positive results, and that they felt afraid that other people would find out about their ongoing treatment. The therapists reported no serious adverse effects or serious deterioration in any participants during the interventions.

Out of 18 participants in the treatment group that rated their overall satisfaction, five rated themselves as very satisfied with the treatment, seven as somewhat satisfied, five as neither satisfied nor dissatisfied, none as somewhat dissatisfied, and one as very dissatisfied with the treatment.
Abbreviations. MADRS-S = Montgomery–Åsberg depression rating scale.

Figure 9 (Study II). Mean depression severity on MADRS-S over the different time points. Error bars are standard deviations.

Study III
The retention rates for the long-term follow-ups were 95% at postintervention, 82% at 1 month, 89% at 3 months, and 84% at 6 months postintervention. Decreases in depressive symptoms measured with MADRS-S were observed with a medium within-group ES at posttreatment ($g = .68$) and at follow-ups at 1 month ($g = .74$), 3 months ($g = .74$), and 6 months ($g = .41$) postintervention, see Figure 10.
Study IV

The themes derived from the TA are shown in Figure 11.

In the first theme, “Acceptability of BA as a concept and intervention for depression,” the BA-MI intervention was experienced by the participants as a good way of increasing activities and improving mood. The activity diary was described as increasing self-awareness between activities and mood. The activity planning made the participants more active, and follow-up on these activities by the therapist increased motivation. However, the pandemic restrictions were experienced as barriers to activities because many activities were postponed or canceled due to the restrictions.

In the second theme, “MI as motivator or irritator,” some participants said that MI was useful in giving focus toward the goals of the activities and gave a deeper understanding of the potential positive effects of the activities. However, others felt that MI was difficult, uncomfortable, and pointless.
The third theme was “Telephone contact similar to face-to-face, but not the same.” Remote delivery of the BA-MI intervention via telephone reduced barriers to communication related to pandemic restrictions and made remote contact possible for those without access to the Internet. Participants stated that compared with face-to-face interaction, contact over the telephone felt less personal, and nonverbal communication was lost. Several participants suggested that the telephone-based intervention could be improved and strengthened by adding one face-to-face session.

The fourth theme was “The importance of being seen as a whole person.” Many participants had thoughts about potential causes for their mood and depression and felt a need to talk about these causes with their therapist that they felt was not covered during the calls. It was seen as important to make room for discussions on the individuals' history, personalities, and needs. To make the intervention more person-centered, the need to be flexible about the time needed for these discussions was stressed.

Lastly, the fifth theme was “The power of being recognized,” in which the participants expressed that receiving a call from the therapist each week for four weeks felt good and was something to look forward to. The contact and conversations with the therapists were healing and an important part of the treatment.

Figure 11 (Study IV). Themes derived from the thematic analysis.
Table 8. Summary of aims, main findings, and conclusions for the studies included in the thesis.

<table>
<thead>
<tr>
<th>Study I</th>
<th>Aims</th>
<th>Main findings</th>
<th>Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluate the diagnostic accuracy at different cutoff values for the Swedish GDS-15 and PHQ-9 compared with a structured clinical interview in older adults.</td>
<td>The AUC was .97 for GDS-15 and .95 for PHQ-9. The highest Youden’s J index was shown for a cutoff of ≥6 on the GDS-15, and ≥5 on the PHQ-9. The proposed cutoff of ≥10 by the originator on the PHQ-9 had a specificity of 95% and a sensitivity of 71%.</td>
<td>The GDS-15 and PHQ-9 had comparable diagnostic accuracy. Although the proposed cutoff of ≥6 on the GDS-15 seems appropriate, the proposed cutoff of ≥10 on the PHQ-9 might be too high when used in community samples in Sweden.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Study II</th>
<th>Aims</th>
<th>Main findings</th>
<th>Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investigate the feasibility and preliminary efficacy of telephone-delivered BA-MI for the treatment of depressive symptoms in individuals 65 years and older in isolation during the Covid-19 pandemic.</td>
<td>The drop-out rate was 7.3%. Between-group ES at post-treatment was $g = .85$ for the primary outcome measure (MADRS-S). Repeated-measures ANOVA was statistically significant ($p = .024$).</td>
<td>The trial was successful with a low drop-out rate. The ES for depressive symptoms was large at posttreatment, and depressive symptoms decreased in the treatment group compared with the control group.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Study III</th>
<th>Aims</th>
<th>Main findings</th>
<th>Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investigate the feasibility of long-term follow-ups at 1, 3, and 6 months after the BA-MI intervention, and to assess depressive symptoms at 1-, 3-, and 6-months postintervention.</td>
<td>Retention rates were 95% at postintervention, 82% at 1 month, 89% at 3 months, and 84% at 6 months postintervention. Compared with baseline, ESs were $g = .68$ at postintervention, $g = .74$ at 1 month, $g = .74$ at 3 months, and $g = .41$ at 6 months.</td>
<td>Long-term follow-ups were feasible. Decreases in depressive symptoms were observed with medium within-group ES at posttreatment and maintained 1- and 3-months posttreatment. After 6 months, ES was smaller but still medium-sized.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Study IV</th>
<th>Aims</th>
<th>Main findings</th>
<th>Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investigate the patients’ experiences of telephone-based BA-MI treatment during the Covid-19 pandemic.</td>
<td>The BA-MI treatment increased activities and improved mood. Telephone delivery reduced barriers due to pandemic restrictions but felt less personal and lacked non-verbal communication. Being recognized and talking to a therapist every week was healing, but the manualized mode of treatment seemed to impair the relationship.</td>
<td>The therapeutic relationship could be augmented by adding one or more face-to-face sessions. Aim to make manual-based psychological interventions as person-centered as possible by making room for the patients as individuals with both a past and present rather than just focusing on intervention delivery.</td>
<td></td>
</tr>
</tbody>
</table>
5. Discussion

5.1 General discussion

In this thesis, results on ways to identify MDD in older adults are presented, as well as results on the feasibility, preliminary efficacy, and experience of a telephone-based BA-MI intervention for depression in older adults.

One fundamental question is: what is depression? Building on a written history starting some 2,500 years back (12), there is relative consensus that symptoms of depression are part of our human existence and expected during many circumstances, but there is also a line, be it somewhat blurry, where depressive symptoms are regarded as a pathological phenomenon, causing suffering and functional disability. This basic consensus apart, definitions and thoughts about the essence of depression may differ. In clinical practice today the diagnosis of depression is demarcated using a set of symptom criteria, and when these criteria have a certain frequency and duration plus functional impairment, we diagnose depression and offer treatment for it.

There are, however, several problems with this categorical approach, as mentioned in the introduction. One is evident in older adults, where subthreshold depression is common, often with the same suffering, functional impairment, and treatment gains as in MDD. Many researchers and clinicians have started viewing psychiatric disorders as spectra rather than categories (21), and depression in older adults fits well with this view (17). Previous research also indicates that there is great variability in how depression presents itself, but also points to different etiological factors and possible subtypes, stressing the importance of person-centered care with individualized interventions.

Study I

Study I compared the diagnostic accuracy of the Swedish versions of the GDS-15 and PHQ-9 in older adults using a structured clinical interview as a reference test. The results showed that both the GDS-15 and PHQ-9 have comparable diagnostic accuracy in classifying MDEs in older adults.

The proposed cutoff of ≥6 on the GDS-15 appears to produce an optimal balance between sensitivity and specificity according to Youden’s J index, 94% and 88%, respectively, in community-dwelling older adults without cognitive impairment, in line with previous studies (56). It is also important to note that a cutoff of ≥5, which is often used as a cutoff in studies (55), had but
a slightly lower Youden’s index in the present study (0.81), with a sensitivity of 100% but lower specificity of 81%. In an additional analysis, the diagnostic accuracy of the GDS-15 for both MDEs and subthreshold depression was examined. A cutoff of ≥5 on the GDS-15 yielded the highest Youden’s J index of .80, with a sensitivity of 92% and a specificity of 87%, suggesting a cutoff of 5 is optimal when screening for depressive disorders in general among older adults in Sweden. As stated in the introduction, the choice of cutoff value is always a trade-off between sensitivity and specificity, and it is important for clinicians to be aware of the fact that on an individual level, screening results below 6 points, with for example 5 points or even lower, does not explicitly rule out an MDD diagnosis, and thus the need for a more comprehensive assessment.

The proposed cutoff of 10 on the PHQ-9 might however be too high, resulting in a high specificity of 95% but a lower sensitivity of 71%. In the present study, a PHQ-9 cutoff of ≥5 resulted in the highest Youden’s index maximizing sensitivity, with a sensitivity of 100% and a specificity of 81%. This result is in line with some studies suggesting that the proposed cutoff on the PHQ-9 is too high when applied in older adults (118, 119), but contrary to others suggesting the proposed cutoff is optimal also for older adults (120). The differences in diagnostic accuracy for the PHQ-9 between studies could be attributable to several factors, such as different populations and settings (e.g., community or clinical), different age groups, or cultural differences. Interestingly, ≥5 points is often used as an indicator of “mild depression” when using PHQ-9 as a measure of depression severity (49). In the present study, all participants were residing in the community, and no one was receiving specialized psychiatric care or had severe depression. The conflicting results between Study I and others could also have been affected by the choice of reference standard; in a recent meta-analysis, individuals 60 years and above had lower sensitivity at the proposed cutoff of 10 when using a fully structured diagnostic interview (e.g., MINI) and a higher sensitivity using a semi-structured interview (e.g., SCID) (120). This could be attributable to the fact that fully structured interviews often are over-inclusive, that is, they classify more individuals as having a condition, compared with semi-structured interviews. This makes it more likely that participants with subthreshold conditions might be classified as having MDD, thus making the rating scale more sensitive at lower scores than at higher scores, as demonstrated previously (120).

Although this thesis presents two rating scales, GDS-15 and PHQ-9, as valuable tools for identifying depression in older adults, it is important to not use these instruments alone, but also make a thorough assessment including clinical interviews, physical examination, and laboratory tests, as well as assessing cognitive status (41, 42).
Study II

Study II suggests that telephone-based BA-MI might be an acceptable and feasible treatment for depression in older adults, as well as feasible during restrictions such as during the Covid-19 pandemic. Large ESs were demonstrated for depressive symptoms (primary outcome, $g = .85$), BA ($g = 1.08$) and visual MI ($g = .81$); medium for depressive symptoms with secondary measures ($g = .58–.69$) and anxiety ($g = .63$); and small for functional ability ($g = .28$). However, because the study had to be terminated early due to changes in restrictions, the sample is small, and results need to be interpreted cautiously as small sample sizes tend to inflate the ES (121). Bearing that in mind, the feasibility and effect posttreatment for depressive symptoms is in line with previous studies of BA (73, 77), brief BA (78, 79), and BA delivered over the telephone in nonpandemic conditions (89, 90) as well as during the Covid-19 pandemic (91). The study also provides support for the feasibility of combining BA with MI, in line with previous studies (94, 97), although questions remain as to how much of the treatment effect is attributable to the respective intervention. The large effect on self-rated activation is also interesting because activation has been hypothesized as a key factor for the treatment (72). The results from Study II indeed show the highest between-group ES for depressive symptoms and BA following the BA-MI treatment. However, according to a systematic review by Janssen and colleagues (76), neither self-rated activation nor environmental reward are significant mediators of depressive symptoms following BA. Rather, the effect may be mediated by more generic processes, such as treatment fidelity and belief in one’s own coping capabilities and taking credit for the improvement (76).

Apart from being an alternative during pandemic restrictions, the BA-MI intervention may also be an alternative during nonpandemic conditions when there are barriers to treatment related to mobility issues for face-to-face treatment, long distances to healthcare providers, or barriers related to technological issues for psychological treatments delivered via the Internet or videoconferencing, making telephone-based care a feasible alternative. Because the BA-MI intervention is more time-efficient with regard to the number of sessions compared with traditional BA or CBT, there might be implications for, for example, primary care with regard to the number of patients that can be offered treatment as well as cost-effectiveness.

Study III

Although Study II indicated that the telephone-based BA-MI intervention was feasible, acceptable, and potentially effective in treating depressive symptoms in older adults postintervention, it was unclear whether the long-term follow-ups were feasible and whether the effects were maintained. In Study III, it was demonstrated that the retention rates were high; 95% at postintervention, 82%
after 1 month, 89% after 3 months, and 84% after 6 months, indicating that long-term follow-ups were feasible. Depressive symptoms measured with MADRS-S were about the same at postintervention ($g = .68$) as at 1- and 3-month follow-ups ($g = .74$ for both) but decreased at the 6-month follow-up ($g = .41$). These results indicate that although the intervention is relatively short in duration with four sessions, the effects on depressive symptoms were maintained over time for many of the participants, in line with previous studies on BA (122). The decrease in ES at long-term follow-ups has been documented in several studies of BA for older adults (77).

Study IV

Although Studies II and III demonstrated that the telephone-delivered BA-MI intervention was feasible and showed promising results with regard to reductions in depressive symptoms as well as overall high satisfaction, we did not know how the participants experienced the intervention. The qualitative design of Study IV gave an opportunity to shed light on this matter, giving unique, in-depth information about the participants’ experiences, which can be used for example to improve the treatment manual and to optimize further full-scale trials.

The results showed that several participants expressed acceptability of BA as a conceptualization for depression and acceptability for the interventions based on BA, in line with previous qualitative research (92). The activity diary, where the participants were asked to log their activities and mood for one week, increased the awareness of the link between behavior and mood. The activity planning as well as the follow-up of completed activities were described as good ways of increasing enjoyable, important, and meaningful activities, in line with BA theory (72). However, the restrictions due to the Covid-19 pandemic were described as a barrier, making it difficult to engage in many, or in some cases any, social and cultural activities, which was also reported in previous research (92).

The experiences of MI were divided, by some described as a motivator and by others as an irritator. Several participants stated that MI gave a focus on the goals of the activities as well as a deeper understanding of the potential positive effects of the activities, in line with previous research on MI as a “motivational amplifier” (97, 123, 124). Other participants described the MI exercises as silly, difficult, or uncomfortable, suggesting that individuals vary in their ability to engage in vivid MI. This finding is also in line with previous research showing that although MI interventions are also feasible for older adults (98), the ability to engage in MI differs between individuals and some individuals seem to lack this ability, known as aphantasia, and previous studies also suggest that the vividness of visual MI may decrease with age (95).

Receiving psychological treatment via the telephone was described as similar to face-to-face, but not the same. Many participants said that the contact
felt less personal and that they missed out on nonverbal information such as facial expressions. Several participants suggested adding one or more face-to-face sessions and conducting the rest over the telephone, a procedure that has been shown to be feasible in a previous pilot study by Gum and colleagues (89). Another suggestion could be to perform the assessment as a face-to-face visit and then the treatment sessions via telephone.

Many participants experienced the contact with the therapist as healing and important for feeling better, and many participants stated that they looked forward to the calls. Some expressed that they would have preferred more calls and felt that the intervention and contact ended rather abruptly. One way of making the ending more gradual could be by adding a booster session, for example, a month after the last session, which has also been suggested in previous studies (80).

Several participants experienced a need to be seen as whole persons with a past and present that they wanted to talk about with their therapist, and many felt a need to talk about potential causes that they themselves had identified for their current mood and depression. This indicates that there is a possibility that the manual-based format and/or the telephone delivery impaired the therapeutic relationship. It is, however, important to keep in mind that the BA-MI intervention was brief and designed to be delivered as a first-line intervention, and not designed to replace regular psychotherapy.

5.2 Limitations

Study I

Study I was conducted in a pooled sample from two separate trials with differences in the procedure; participants from the PLLAT trial (n = 77) performed the MINI face-to-face directly after completing the rating scales, whereas participants from the CoviDep trial (n = 36) completed the rating scales at home and performed the MINI on the telephone within two weeks. However, previous studies show that MINI conducted over the telephone yields equivalent results compared with face-to-face (125), and two weeks between the index test and reference test is often acceptable in meta-analyses (56).

Furthermore, all MINI interviews in the PLLAT trial were performed by the same psychologist, whereas in the Covi-Dep trial, four additional psychologists performed MINI interviews. We did not investigate the interrater reliability, which is a limitation, as different interviewers may score and interpret the MINI differently. However, the MINI interview is highly structured, and all psychologists were trained and experienced in the administration.
Another limitation of Study I was that only participants meeting the DSM-5 criteria for MDEs were included in the depression group. As mentioned previously, research suggests that many older individuals do not meet the full criteria for MDE, but rather present with subthreshold depression (18, 20). This might have been accounted for to some extent using MINI which, as mentioned earlier, tends to be over-inclusive compared with semi-structured interviews (120). In an additional analysis of the diagnostic accuracy of GDS-15, it was shown that the optimal cutoff for depressive disorders in general (i.e., both MDD and subthreshold depression) was ≥5, which has been shown in previous studies (55).

Study II

In Study II, the session time differed between the control group and the treatment group. This was both because the treatment was new, combining two interventions, and thereby session duration was difficult to predict, and the fact that it was difficult to sustain longer sessions in the control condition. This might have affected the results, as the treatment group not only received the active treatment but also longer sessions with social interaction with the therapist.

Another limitation is the fact that the trial was open labeled (i.e., the participants knew which condition they were randomized to), which might have affected the control group, for example by adding a sense of frustration, but also the treatment group, as knowing you receive treatment may increase the expectancy of positive effects. However, because the trial included participants with clinically significant depressive symptoms, it was deemed unethical not to disclose this to the participants or to use a sham treatment.

Furthermore, because of changes in pandemic recommendations and restrictions, half of the participants completed treatment with heavier restrictions concerning social distancing and self-isolation in place, which might have affected the results. However, because the participants were consecutively enrolled, randomized, and treated, this affected the control group and treatment group equally.

Neither the treatment nor control intervention delivered by the therapists were reviewed by independent raters for treatment fidelity, which makes it uncertain to what extent each therapist adhered to the treatment manual. However, both the treatment and control intervention were structured and manual-based, and a digital checklist was used.

Another limitation is that whereas the rating scales were performed by the patients at home and scored by a research nurse and thereby blinded to the therapists, the MINI interviews posttreatment were performed by the patients’ therapists, which may have contributed to bias. However, as stated previously, the MINI is highly structured, which might mitigate these effects.
The sample consisted of volunteers recruited via advertisements, and the majority of the participants (84%) were women with Swedish as their native language. These issues limit the generalizability to other groups or environments, as well as the generalizability of the results to older adults in general.

Study III

Even though the demonstrated retention rates in Study III were high, ranging from 82% to 95%, it is important to note that the total sample was small, which limited the possibility for statistical analyses. As in Study II, the ESs need to be interpreted with caution, as small sample sizes tend to inflate the ES (121).

Study III included only participants who had received intervention with no control condition, which makes it impossible to ascertain how long-term the results would be for participants not receiving intervention. This procedure was, however, necessary because it would have been unethical to withhold the participants in the control condition from intervention as the control condition was only an attention control and not another active treatment.

Furthermore, because the participants were pooled from two groups, the treatment condition (n = 20) and the control condition (n = 18) receiving the intervention after four weeks, there was a difference in the procedure, where 20 of the participants received a four-week intervention directly and 18 of the participants received four weeks on the waitlist with attention control followed by the four-week intervention. This was, however, accounted for by establishing a new baseline for the control condition before receiving the intervention.

Study IV

In Study IV, all interviews were conducted over the telephone, which may have led to a loss of nonverbal communication that could have been of importance to the researchers because communication is not just about what you are saying, but also how it is being said. Another issue is that the interviews were performed by three different interviewers, and no participant was interviewed by their own therapist or by the study coordinator. This was done to minimize bias and to maximize the ability of the participants to be honest about their experiences. Although there was an interview guide, the interviews were semi-structured, which might have made the interviews different depending on who the interviewer was, what kind of follow-up questions were asked, and at what depth. Furthermore, we did not include any drop-out participants as they were few and declined further participation. We did, however, include participants experiencing no effect of the treatment in the study, but also including dropouts could have elucidated ways to improve the treatment or study design to decrease attrition.

Another limitation, as mentioned previously, is the predominance of women and participants with Swedish as their native language in Study IV.
The sample in Study IV is however representative of the samples in Studies II and III, where about 80% of the participants were women, and most participants had Swedish as their native language.

There are also methodological issues related to how we applied TA that are worth discussing because the use of TA differs depending on how qualitative methodology is viewed. First of all, TA is not one approach, but rather a family of methodologies on a spectrum, ranging from a quantitative/postpositivist approach referred to as coding reliability, to an approach called reflexive TA grounded in a qualitative paradigm (117, 126). In this study, data were analyzed using TA based on descriptive phenomenology closer to the reflexive end of the TA spectrum (99, 117). One implication of this is how the two researchers worked with the analysis. When using multiple coders, coding reliability approaches recommend generating themes and developing a coding frame early on, and measuring intercoder reliability to achieve objectivity and accuracy according to the coding frame (126). However, in the TA approach based on descriptive phenomenology, multiple coders strengthen the analysis by offering different or supplementary views, and maintain reflexivity by questioning statements and pre-understandings of the researchers (99). In a reflexive approach to TA, researcher subjectivity is seen as a tool rather than a problem, and there is no need to reach a consensus because coding is subjective and thereby cannot be “accurate” (117).

Another implication is the choice of participants. One common strategy for the choice of sample size in qualitative studies involves the term “saturation,” where data are collected until no new information is obtained (117). We opted for a purposive sampling strategy more aligned with reflexive TA (117), choosing participants that we thought could give variation to maximize our understanding with regard to sex, age, treatment effect, and geography.

5.3 Conclusions and future research

Study I gives support to the national guidelines recommending the GDS-15 for the detection of depression in older adults, but highlights the need for further studies on the PHQ-9, which is also recommended and widely used. According to the results from the present study, the proposed cutoff on the PHQ-9 might result in a failure to detect three in ten individuals with depression compared with a lower cutoff. Because the optimal cutoff values often differ depending on setting and population characteristics, it would be of value to investigate the Swedish GDS-15 and PHQ-9 in different clinical settings, such as primary care and specialized psychiatry, and in different age groups.

Studies II and III demonstrated that the telephone-delivered BA-MI intervention was feasible, with promising results regarding reduction in depressive symptoms that for many participants were maintained for up to 6 months.
Hopefully, these results can be used to further improve upon BA and MI interventions as well as upon telephone-delivered psychological treatment for older adults and be used as a starting point for full-scale clinical trials of the intervention in clinical contexts. Further studies in larger samples are needed to investigate the long-term effects, for example, if there is a general deterioration in mood after 6 months or if there are subgroups with different trajectories. The long-term effects of this intervention should also be compared with control conditions. It would also be of interest to investigate if telephone-delivery differs with regards to effect compared with face-to-face delivery or videoconferencing. It is also of interest to perform studies dismantling the effect of the BA and the MI component. Although previous studies on BA for older adults as well as the studies in this thesis show promising results for the treatment of depression, there is a need for further full-powered studies, as well as studies delineating for whom BA works and why. Future studies should also seek to be more inclusive of individuals with other native languages and cultural backgrounds, as well as include more men.

Study IV showed that the participants experienced the BA-MI intervention as a good way of increasing activities and improving mood. Telephone delivery reduced barriers due to pandemic restrictions but felt less personal and lacked nonverbal communication. Being recognized and talking to a therapist every week was healing, but the manualized mode of treatment impaired the therapeutic relationship. The therapeutic relationship could be augmented by adding one or more face-to-face sessions. When using manual-based psychological interventions one should aim to make them as person-centered as possible by making room for the patients as individuals with both a past and present rather than just focusing on intervention delivery.

In sum, there is vast support for psychological treatment as an effective treatment for depression in older adults, with emerging evidence demonstrating the efficacy of BA. Face-to-face delivery is the most studied mode of delivery, but studies also suggest that delivery is feasible using remote delivery. This thesis adds to the support for telephone-delivered BA for the treatment of depression and indicates that MI interventions are feasible as an augmentation of BA in older adults. In addition, rather than thinking either-or, we should consider all evidence-based psychological treatments and delivery modes as part of a palette, where the ultimate goal is to offer evidence-based and person-centered psychological treatments that work for each patient. With only about 3% of older adults with depression reporting receiving psychological treatment, there is work to do.

To conclude: Depression exists as one extreme in the continuum of normal human feelings and behaviors, that causes functional impairment and suffering, with individual variability with regard to presentation of symptoms, and also, probably, with regard to causes. Depression can be modified using psychological and pharmacological treatment to improve mood, increase functional ability, and improve quality of life.
6. Svensk sammanfattning (Summary in Swedish)

Inledning
Ungefär var tionde äldre individ världen över är drabbad av depression (31). Depression är en psykiatrisk diagnos som innebär att en individ är ihållande nedstämd och/eller har minskat intresse eller minskad glädje för saker i tillvaron jämfört med tidigare (14), samt har andra symtom såsom:

- förändring av aptiten
- förändring av sömnen
- långsammare rörelser och tankeförmåga eller rastlöshet
- energilöshet
- svårigheter att koncentrera sig, tänka eller fatta beslut
- känslor av värdelöshet eller skuld
- tankar på döden, dödsönskan eller planer på att ta sitt liv

Depression skapar ett stort lidande hos den drabbade och ökar risken för andra sjukdomar (8), både kroppsliga och psykiatriska, samt ger försämrad livskvalitet (5) och funktion (6) i vardagen. Många äldre individer med depression missas av vården (43, 44), och merparten får ingen behandling alls (33, 69), trots att depression är ett behandlingsbart tillstånd (42). Det finns därför ett behov av metoder för att identifiera äldre med depression, samt ett behov av snabba, effektiva psykologiska interventioner för behandling av depression.

Syfte
Avhandlingen består av fyra delarbeten och har två övergripande syften:
1. att undersöka hur träffsäkra två skattningsskalor (PHQ-9 och GDS-15) är när det gäller att identifiera depression hos äldre
2. att undersöka genomförbarhet, preliminär effekt samt patienters upplevelse av en telefonbaserad psykologisk intervention, beteendeaaktivering med mentala bilder (BA-MI), för behandling av depression hos äldre under coronapandemin.
Metod och resultat

**Delarbete I** var en tvärsnittsstudie med 117 deltagare och undersökte hur träffsäkra två skattningsskalor för depression (PHQ-9 och GDS-15) var när det gällde att identifiera depression hos äldre, jämfört med en standardiserad psykiatrisk intervju. Resultaten visade att båda skattningsskalorna hade god träffsäkerhet, och att ett gränsvärde på $\geq 6$ poäng på GDS-15 respektive $\geq 5$ poäng på PHQ-9 var optimalt.

**Delarbete II-IV** genomfördes inom ramen för studien CoviDep, som undersökte BA-MI-interventionen för behandling av depression hos personer 65 år och äldre under coronapandemin. Interventionen bestod av fyra telefonsamtal med psykolog. Syftet med beteendektivisering är att öka mängden lustfyllda, meningsfulla och viktiga aktiviteter, och därigenom förbättra måendet och minska depression. För att öka motivationen att genomföra aktiviteterna användes mentala bilder.

**Delarbete II** var en randomiserad klinisk pilotstudie, där 41 deltagare fördelades slumpvis till att ingå antingen i behandlingsgrupp eller i kontrollgrupp. Behandlingsgruppen fick genomgå BA-MI-interventionen enligt ovan direkt. Kontrollgruppen fick däremot värna i fyra veckor på att påbörja BA-MI-interventionen, och för att följa upp måendet under vänteperioden kontaktades de varje vecka av behandlare. Resultaten visade att studien var genomförbar med få avhopp. Depressionssymptomen minskade i behandlingsgruppen för varje vecka i behandlingen samt direkt efter behandling, medan ingen minskning sågs för kontrollgruppen. Efter behandling sågs en stor effektstörlek mellan behandlingsgrupp och kontrollgrupp vad gällde depressionssymtom.

**Delarbete III** var en långtidsuppföljning med 38 deltagare som genomgick BA-MI-interventionen, och inkluderade både de som fördelades till behandlingsgrupp och de som randomiserades till kontrollgrupp och sedan efter fyra veckor fick BA-MI-interventionen. Bortfallet var lågt både efter behandling och 1-, 3- och 6 månader efter interventionen. Jämfört med före behandling sågs medelstor effekt på depressionssymtom efter interventionen, och denna effekt var jämförlig 1- och 3 månader efter behandling. Efter 6 månader var effektstörelsen lägre men fortsatt medelstor.

Slutsatser


2. Den telefonbaserade BA-MI-interventionen hade god effekt för att minska depressionssymtomen hos äldre under coronapandemin, och avhoppet från studien var få. Interventionsen kan vara användbar även bortom coronapandemin när distansalternativ är att föredra för äldre individer med depression, till exempel vid långa avstånd eller vid funktionsnedsättningar. Interventionens effekt behöver emellertid bekräftas i större studier samt i kliniska miljöer såsom primärvård.
7. Tack


Till min bihandledare Marie Kivi. Förutom intresset för psykologisk behandling och geropsykologi delar vi också kärleken till Dalsland. Jag har verkligen uppskattat våra arbetsdagar i Göteborg, dina skarpa analyser, din språkliga noggrannhet och din ihärdighet i att övertyga mig om att sluta använda Word som en skrivmaskin.

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8. References


51. Patient Health Questionnaire-9 (PHQ-9) som stöd för diagnostik och bedömning av svårighetsgrad av depression [Elektronisk resurs]: SBU; 2018.


81. de Oliveira PBF, Dornelles TM, Gosmann NP, Camozzato A. Efficacy of telemedicine interventions for depression and anxiety in older people: A
114. Lakens D. Calculating and reporting effect sizes to facilitate cumulative science: a practical primer for t-tests and ANOVAs. Front Psychol. 2013;4:863.
Appendix

Geriatric depression scale 15-item, GDS-15

**Valj det alternativ som bäst beskriver hur du känt dig den senaste veckan:**

<table>
<thead>
<tr>
<th>Uttryck</th>
<th>Ja</th>
<th>Nej</th>
</tr>
</thead>
<tbody>
<tr>
<td>Är du i grund och botten nöjd med ditt liv?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Har du gett upp många aktiviteter och intressen?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tycker du att ditt liv är tomt?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blir du ofta uttråkad?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Är du oftest på gott humör?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Är du rädd att något ska hända dig?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Känner du dig oftest glad och nöjd?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Känner du dig ofta hjälplös?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vill du hellre stanna hemma än gå ut och prova nya sysselsättningar?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tycker du att du har fler problem med ditt minne än de flesta andra?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tycker du att det känns bra att leva?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Känner du dig tämligen värdelös som du är nu?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Känner du dig full av energi?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tycker du att din situation är hopplös?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tycker du att de flesta andra har det bättre än du?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Patient health questionnaire 9, PHQ-9

Under de senaste 2 veckorna, hur ofta har du besvärats av något av följande problem?

<table>
<thead>
<tr>
<th>Lite intresse eller minskad glädje i att göra saker</th>
<th>Inte alls</th>
<th>Flera dagar</th>
<th>Mer än hälften av dagarna</th>
<th>Nästan varje dag</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Känt dig nedstämd, deprimerad eller känt att framtiden ser hopplös ut</th>
<th>Inte alls</th>
<th>Flera dagar</th>
<th>Mer än hälften av dagarna</th>
<th>Nästan varje dag</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Problem att somna eller att vaknat i förtid, eller sovit för mycket</th>
<th>Inte alls</th>
<th>Flera dagar</th>
<th>Mer än hälften av dagarna</th>
<th>Nästan varje dag</th>
</tr>
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<tbody>
<tr>
<td>□ 0</td>
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<td>□ 3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Känt dig trött eller energilös</th>
<th>Inte alls</th>
<th>Flera dagar</th>
<th>Mer än hälften av dagarna</th>
<th>Nästan varje dag</th>
</tr>
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<tbody>
<tr>
<td>□ 0</td>
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<td>□ 2</td>
<td>□ 3</td>
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<table>
<thead>
<tr>
<th>Dålig aptit eller att du ätit för mycket</th>
<th>Inte alls</th>
<th>Flera dagar</th>
<th>Mer än hälften av dagarna</th>
<th>Nästan varje dag</th>
</tr>
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<table>
<thead>
<tr>
<th>Dålig självkänsla - eller att du känt dig misslyckad eller att du svikit dig själv eller din familj</th>
<th>Inte alls</th>
<th>Flera dagar</th>
<th>Mer än hälften av dagarna</th>
<th>Nästan varje dag</th>
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<thead>
<tr>
<th>Svårigheter att koncentrera dig, till exempel när du läst tidningen eller sett på TV</th>
<th>Inte alls</th>
<th>Flera dagar</th>
<th>Mer än hälften av dagarna</th>
<th>Nästan varje dag</th>
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<td>□ 2</td>
<td>□ 3</td>
<td></td>
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<table>
<thead>
<tr>
<th>Att du rört dig eller talat så långsamt att andra noterat det? Eller motsatsen – att du varit så nervös eller rastlös att du rört dig mer än vanligt</th>
<th>Inte alls</th>
<th>Flera dagar</th>
<th>Mer än hälften av dagarna</th>
<th>Nästan varje dag</th>
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<tbody>
<tr>
<td>□ 0</td>
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<td>□ 3</td>
<td></td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Tankar att det skulle vara bättre om du var död eller att du skulle skada dig på något sätt</th>
<th>Inte alls</th>
<th>Flera dagar</th>
<th>Mer än hälften av dagarna</th>
<th>Nästan varje dag</th>
</tr>
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<td>□ 1</td>
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</tr>
</tbody>
</table>
Montgomery-Åsberg depression rating scale, MADRS-S

Nu kommer du få se en rad olika påståenden om hur man kan må i olika avseenden. Påståendena uttrycker olika grader av obehag, från fränvaro av obehag till maximalt uttalat obehag. **Ringa in den siffra (0–6) som du tycker bäst stämmer in med hur du mått de senaste tre dagarna.** Tänk inte alltför länge, utan försök arbeta snabbt.

### 1. Sinnesstämnning

Här ber vi dig beskriva din sinnesstämnning, om du känner dig ledsen, tungsint eller dyster till mods. Tänk efter hur du har känt dig de senaste tre dagarna, om du har skiftat i humöret eller om det varit i stort sett detsamma hela tiden, och försök särskilt komma ihåg om du har känt dig lättare till sinnes om det hänt något positivt.

- 0 Jag kan känna mig glad eller leden, alltefter omständigheterna.
- 1 Jag känner mig nedstämd för det mesta, men ibland kan det kännas lättare.
- 2 Jag känner mig genomgående nedstämd och dyster. Jag kan inte glädja mig åt sådant som vanligen skulle göra mig glad.
- 3 Jag är totalt nedstämd och så olycklig att jag inte kan tänka mig värre.

### 2. Oroskänslor

Här ber vi dig markera i vilken utsträckning du haft känslor av inre spänning, olust och ångest eller odefinierad rädsla under de senaste tre dagarna. Tänk särskilt på hur intensiva känslorna varit, och om de kommit och gått eller funnits nästan hela tiden.

- 0 Jag känner mig mestadels lugn.
- 1 Ibland har jag obehagliga känslor av inre oro.
- 2 Jag har ofta en känsla av inre oro, som ibland kan bli mycket stark, och som jag måste anstränga mig för att bemästra.
- 3 Jag har fruktansvärda, långvariga eller outhärdliga ångestkänslor.

### 3. Sömn

Här ber vi dig beskriva hur du sover. Tänk efter hur länge du sovit och hur god sömnen varit under de senaste tre nätterna. Bedömningen ska avse hur du faktiskt sovit, oavsett om du tagit sömnmedel eller ej. Om du sover mer än vanligt, sätt din markering vid 0.

- 0 Jag sover lugnt och bra och tillräckligt länge för mina behov. Jag har inga särskilda svårigheter att somna.
- 1 Jag har vissa sömnsvårigheter. Ibland har jag svårt att somna eller sover ytligare eller oroigare än vanligt.
- 2 Jag sover minst två timmar mindre per natt än normalt. Jag vaknar ofta under natten, även om jag inte blir stört.
- 3 Jag sover mycket dåligt, inte mer än 2–3 timmar per natt.
4. Matlust

Här ber vi dig ta ställning till hur din aptit är, och tänka efter om den på något sätt skilt sig från vad som är normalt för dig. Om du skulle ha bättre aptit än normalt, markera då det på 0.

0 Min aptit är som den brukar vara.
1 Min aptit är sämre än vanligt.
2 Min aptit har nästan helt försvunnit. Maten smakar inte och jag måste tvinga mig att äta.
3 Jag vill inte ha någon mat. Om jag ska få något matning i mig, måste jag övertalas att äta.

5. Koncentrationsförmåga

Här ber vi dig ta ställning till din förmåga att hålla tankarna samlade och koncentrera dig på olika aktiviteter. Tänk igenom hur du fungerar vid olika sysslor som kräver olika grad av koncentrationsförmåga, t.ex. läsning av komplicerad text, lätt tidningstext och tv-tittande.

0 Jag har inga koncentrationssvårigheter.
1 Jag har tillfälligt svårt att hålla tankarna samlade på sådant som normalt skulle fånga min uppmärksamhet (t.ex. läsning eller tv-tittande).
2 Jag har påtagligt svårt att koncentrera mig på sådant som normalt inte kräver någon ansträngning från min sida (t.ex. läsning eller samtal med andra människor).
3 Jag kan överhuvudtaget inte koncentrera mig på någonting.

6. Initiativförmåga


0 Jag har inga svårigheter med att ta itu med nya uppgifter.
1 När jag ska ta itu med något, tar det emot på ett sätt som inte är normalt för mig.
2 Det krävs en stor ansträngning för mig att ens komma igång med enkla uppgifter som jag vanligtvis utför mer eller mindre rutinmässigt.
3 Jag kan inte förmå mig att ta itu med de enklaste vardagsbestyr.

7. Känslomässigt engagemang

Här ber vi dig ta ställning till hur du upplever ditt intresse för omvärlden och för andra människor, och för sådana aktiviteter som brukar bereda dig nöje och glädje.

0 Jag är intresserad av omvärlden och engagerar mig i den, och det bereder mig både nöje och glädje.
1 Jag känner mindre starkt för sådant som brukar engagera mig. Jag har svårare än vanligt att bli glad eller svårare att bli arg när det är befogat.
2 Jag kan inte känna något intresse för omvärlden, inte ens för vänner och bekanta.
3 Jag har slutat uppleva några känslor. Jag känner mig smärtsamt likgiltig även för mina närmaste.
8. Pessimism
Frågan gäller hur du ser på din egen framtid och hur du uppfattar ditt eget värde. Tänk efter i vilken utsträckning du gör dig självförbråelser, om du plågas av skuldkänslor, och om du oroat dig oftare än vanligt för t.ex. din ekonomi eller din hälsa.

0 Jag ser på framtiden med tillförsikt. Jag är på det hela taget ganska nöjd med mig själv.
1 Ibland klandrar jag mig själv och tycker att jag är mindre värd än andra.
2 Jag grubblar ofta över mina misslyckanden och känner mig mindervärdig eller dålig, även om andra tycker annorlunda.
3 Jag ser allting i svart och kan inte se någon ljusning. Det känns som om jag var en alltigenom dålig människa, och som om jag aldrig skulle kunna få någon förlåtelse för det hemska jag gjort.

9. Livslust
Frågan gäller din livslust, och om du känt livsleda. Har du tankar på självmord, och i så fall, i vilken utsträckning upplever du detta som en verklig utväg?

0 Jag har normal aptit på livet.
1 Livet känns inte särskilt meningsfullt, men jag önskar ändå inte att jag vore död.
2 Jag tycker ofta det vore bättre att vara död, och trots att jag egentligen inte önskar det, kan självmord ibland kännas som en möjlig utväg.
3 Jag är egentligen övertygad om att min enda utväg är att dö, och jag tänker mycket på hur jag bäst ska gå tillväga för att ta mitt eget liv.
Generalized anxiety disorder 7-item scale, GAD-7

**Har Du under de senaste två veckorna bevärats av något av detta?**

<table>
<thead>
<tr>
<th></th>
<th>Inte alls</th>
<th>Flera dagar</th>
<th>Flertalet dagar</th>
<th>Så gott som dagligen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Känt mig nervös, orolig, spänd</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
</tr>
<tr>
<td>Inte kunnat låta bli att ångslas</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
</tr>
<tr>
<td>Ångslats för mycket för olika saker</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
</tr>
<tr>
<td>Haft svårt att koppla av</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
</tr>
<tr>
<td>Varit så rastlös att det varit svårt att sitta still</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
</tr>
<tr>
<td>Varit retlig och lättstörd</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
</tr>
<tr>
<td>Varit rädd, som om något förfärligt skulle kunna hända</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
</tr>
</tbody>
</table>
**Behavioral activation for depression scale – short form, BADS-SF**

Var vänlig och läs varje påstående noggrant och ringa in sedan den siffra som bäst beskriver i vilken grad påståendet har varit sant för dig UNDER DEN SENASTE VECKAN INKLUSIVE IDAG.

<table>
<thead>
<tr>
<th>Påstående</th>
<th>Inte alls</th>
<th>Lite grann</th>
<th>Mycket</th>
<th>Fullständigt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jag har låtit bli att göra vissa saker som jag behövde få gjorda.</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
</tr>
<tr>
<td>Jag är nöjd med både mängden och typen av aktiviteter jag ägnat mig åt.</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
</tr>
<tr>
<td>Jag har ägnat mig åt många olika aktiviteter.</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
</tr>
<tr>
<td>Jag har gjort bra val vad gäller vilka typer av aktiviteter och/eller situationer som jag ägnat mig åt.</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
</tr>
<tr>
<td>Jag har varit aktiv och uppnått de mål som jag hade föresatt mig att göra.</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
</tr>
<tr>
<td>Jag har mest ägnat mig åt att fly ifrån eller undvika något obehagligt.</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
</tr>
<tr>
<td>Jag har ägnat mycket tid till att grubbla över mina problem.</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
</tr>
<tr>
<td>Jag har ägnat mig åt saker för att inte känna mig dålig</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
</tr>
<tr>
<td>Jag har gjort saker som var trevliga</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
</tr>
</tbody>
</table>
WHO disability assessment schedule 2.0, WHODAS 2.0


<table>
<thead>
<tr>
<th>Vilken svårighet har du haft på grund av ditt hälsotillstånd under de senaste 30 dagarna med:</th>
<th>Ingen</th>
<th>Liten</th>
<th>Måttlig</th>
<th>Stor</th>
<th>Extrem/ kan inte</th>
</tr>
</thead>
<tbody>
<tr>
<td>Att stå under längre perioder såsom 30 minuter?</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
</tr>
<tr>
<td>Att ta hand om ditt hushåll?</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
</tr>
<tr>
<td>Att lära dig en ny uppgift (till exempel hur man tar sig till en ny plats)?</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
</tr>
<tr>
<td>Hur stort problem har du haft med att delta i aktiviteter i samhället (till exempel festligheter, religiösa eller andra aktiviteter) på samma sätt som andra kan?</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
</tr>
<tr>
<td>Hur mycket har du påverkats känslomässigt av ditt hälsotillstånd?</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
</tr>
<tr>
<td>Att koncentrera dig under tio minuter på att göra något?</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
</tr>
<tr>
<td>Att gå en längre sträcka såsom en kilometer?</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
</tr>
<tr>
<td>Att tvätta hela kroppen?</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
</tr>
<tr>
<td>Att klä dig?</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
</tr>
<tr>
<td>Att bemöta människor som du inte känner?</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
</tr>
<tr>
<td>Att bibehålla en vänskapsrelation?</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
</tr>
<tr>
<td>Ditt dagliga arbete eller studier?</td>
<td>□ 0</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
</tr>
</tbody>
</table>
Plymouth sensory imagery questionnaire, Psi-Q

Var god och försök att föreställa dig bilderna beskrivna nedan och skatta varje mental bild enligt följande skala: 0 (ingen bild alls) till 10 (bilden lika klar och levande som i verkliga livet). Kryssa i en ruta för varje rad.

<table>
<thead>
<tr>
<th>Föreställ dig bilden av:</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>En vän du känner väl</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>En katt som klättrar i ett träd</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>En solnedgång</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ytterdörren till ditt hem</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>En brasa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
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