

Moved by movement

**A person-centered approach to physical therapy
in the treatment of major depression**

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I carry a weight, on my back
I have to carry all the weight
And how I need a helping hand

Broder Daniel, 1996 "Sorrow"

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ABSTRACT

Major depression (MD) is a common and debilitating condition. To expand knowledge on adjunctive treatment perspectives, this thesis explores a physical therapy approach in the treatment of MD. Specifically, in five studies, the thesis aims to: I) examine the quality of evidence for exercise in the treatment of MD; II) explore depression as an embodied phenomenon; III) evaluate the effects of add-on aerobic exercise or basic body awareness therapy in MD; IV) explore basic body awareness therapy as experienced by persons with MD; and V) explore experiences of physical therapist-guided aerobic exercise in persons with MD.

Methods: Several methodological approaches were used: a systematic review of 14 randomized controlled studies (study I), a randomized controlled trial of 62 participants (study III) and qualitative studies using a hermeneutic phenomenological approach (studies II, IV) exploring the experiences of 11 and 15 participants, respectively, and content analysis (study V) exploring the experiences of 13 participants.

Results: Study I showed that aerobic exercise, applied as an add-on strategy compared to treatment-as-usual, had a small significant effect on depression severity. The grading of the quality of evidence was low. Study II showed that the embodiment of depression is experienced as an ambiguous striving against fading, involving disabling features of feeling confined, estranged and burdensome, but also enabling moments of sensing life and belongingness. Study III showed that a ten-week intervention of aerobic exercise, guided by a physical therapist using a person-centered approach, significantly improved

depression severity and cardiovascular fitness, compared to generic advice on physical activity. Basic body awareness therapy had a significant effect on self-rated depressive symptoms among participants who followed the protocol. In study IV, the participants' experiences of basic body awareness therapy were understood as a process of enhanced perceptual openness toward oneself and others – a multidimensional *opening toward life*. In study V, the participants' experiences of physical therapist-guided aerobic exercise were thematically interpreted as *setting one's own capabilities in motion*, increasing a sense of aliveness and ability to act. In both study IV and V, the participants described the importance of a collaborative relationship with the physical therapist. To some participants, the sense of group coherence was also important.

Conclusion: Overall, the findings of this thesis suggest that add-on physical therapy, in particular guided aerobic exercise, mediate changes in the depressed person's symptoms and self-experience. Collaborative support from the physical therapist was essential in this process, involving an embodied dialogue, perceptive to both the participant's abilities and vulnerability. Physical therapy has potential to take on a more important role in the primary care rehabilitation of MD, but larger studies with long-term follow-ups are needed.

Keywords: major depression, movement, person-centred care, exercise, basic body awareness therapy, randomized controlled trial, hermeneutic phenomenology, qualitative content analysis, systematic review, physical therapy

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SAMMANFATTNING PÅ SVENSKA

Depression är ett växande folkhälsoproblem som medför stora kostnader för samhället och stort lidande för de personer och anhöriga som drabbas. Trots att antidepressiv medicinering och psykoterapi har visat goda effekter, blir ungefär en tredjedel av de drabbade inte hjälpta av dessa behandlingar. Således är ett bredare behandlingsutbud önskvärt. Ett relativt outforskat område är fysioterapi med fokus på rörelse och kroppsupplevande. Denna avhandling har haft som syfte att utforska fysioterapi i form av konditionsträning respektive basal kroppskänedom, som tilläggsbehandling för personer med depression.

Avhandlingen innefattar fem delarbeten som studerar effekter av de fysioterapeutiska behandlingarna, men också hur deltagarna upplever och beskriver dessa. En inledande ramberättelse sammanbinder delarbetena och sätter resultaten i relation till teoretiska perspektiv, samt ger förslag på hur resultaten kan användas inom primärvårdsrehabilitering.

Resultaten pekar övergripande mot att rörelsebaserade, fysioterapeutiska behandlingar såsom guddad konditionsträning eller basal kroppskänedom påverkar depressiva symptom positivt och förändrar upplevelsen av den egna kroppen och handlingsförmågan. Särskilt god effekt hade konditionsträning i små grupper hos fysioterapeut, där upplägget genomtyrades av ett person-centrerat förhållningssätt. Detta innebär i korthet att träningen utgår från patienten som person, bortom diagnosen, och riktas mot ett samarbete som stärker hans eller hennes egen förmåga, men också ger utrymme för den sårbarhet och det motstånd som depressionen innebär. I intervjuer med deltagarna sågs relationen och den både verbala och icke-verbala dialogen mellan patient och fysioterapeut, och i vissa fall mellan gruppdeltagare, ha stor betydelse för motivation och förändring.

LIST OF PAPERS

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

- I. Danielsson L, Noras A-M, Waern M, Carlsson J. Exercise in the treatment of major depression: A systematic review grading the quality of evidence. *Physiotherapy Theory and Practice*. 2013; 29(8): 573-85.
- II. Danielsson L, Rosberg S. Depression embodied: an ambiguous striving against fading. *Scandinavian Journal of Caring Sciences*. 2014 Sep 23 doi: 10.1111/scs.12182 [Epub ahead of print].
- III. Danielsson L, Papoulias I, Petersson, E-L, Carlsson J, Waern M. Exercise or basic body awareness therapy as add-on treatment for major depression: A controlled study. *Journal of Affective Disorders*. 2014; 168: 98-106.
- IV. Danielsson L, Rosberg S. Opening toward life: experiences of basic body awareness therapy in persons with major depression. Accepted for publication in *International Journal of Qualitative Studies on Health and Well-being*, 2015 Apr 3.
- V. Danielsson L, Kihlbom B, Rosberg S. Capabilities in motion: experiences of physical therapist-guided aerobic exercise in persons with major depression. Submitted.

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APPENDIX: STUDY I-V

ABBREVIATIONS

ANCOVA	Analysis of covariance
BAI	Beck's anxiety inventory
BBAT	Basic body awareness therapy
DSM IV/V	Diagnostic and statistical manual of mental disorders, 4 th or 5 th edition
GAF	Global assessment scale of functioning
GRADE	Grading and recommendations, assessment, development and evaluation
MADRS (-S)	Montgomery Åsberg depression rating scale (-S for self-rated version)
MD	Major depression
ICD-10	International classification of diseases, 10 th revision
ITT	Intention-to-treat
PP	Per protocol
PT	Physical therapy / Physical therapist
RCT	Randomized controlled trial
SCB	Scale of body connection

DEFINITIONS IN SHORT

Major depression	The psychiatric term for a clinically relevant depression, according to the criteria of the Diagnostics and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013)
Body awareness	A multifaceted concept understood as: a) the sensory awareness that originates from the body's physiological states, processes (including pain and emotions) and functions as an interactive process that includes a person's appraisal and is shaped by attitudes, beliefs and experiences in their sociocultural context (Mehling et al. 2009) and b) the embodied identity involving both awareness of one's body from within and one's embodied interaction with others (Lundvik Gyllensten et al. 2010)
Physical activity	Any bodily movement produced by skeletal muscles that results in energy expenditure (Casparsson, 1985)
Exercise	Physical activity that is structured and repetitive, designed to improve or maintain physical fitness (Casparsson, 1985)
Person-centered care	A care approach that highlights the importance of acknowledging the person behind the patient – as a human being with reason, will, feelings and needs – in order to engage the person in his/her treatment (Ekman et al., 2011)
Phenomenology	The study of “phenomena”; appearances of things, or things as they appear in our experience, or the ways we experience things, thus the meaning things have in our experience (The Stanford Encyclopedia of Philosophy, 2013)
The lived body	The perceived/perceiving body as our fundamental means to relate to the world (Merleau-Ponty, 1965).
Hermeneutics	Theory or methodological principles of interpretation (The Stanford Encyclopedia of Philosophy, 2013)

PREFACE

Movement is the first and last sign of life – we begin and we end with movement. Yet, movement related to the desolate, standstill experience of depression is a trail tread by few researchers. Why is this? In silence, physical therapists walk side by side with patients suffering from depression, listening with ears, hands and guiding movements, somewhat knowing more than words can explain. Facilitating and provoking. At times astonished by the wonders of movement, at times frustrated by inadequacy and the resistance of and between bodies. This was where I set out for this project.

Science at the crossroads: conflict or possibility? This thesis grows in the intersection between medical science and the humanities in terms of the phenomenological and hermeneutic traditions. The reason for this is threefold. First, the phenomenon of depression is approached both as a medical diagnosis within a frame of psychiatric classifications and from the subjectively lived experience of what it is like and what it means for people to be depressed. Second, the person-centered perspective that permeates the thesis, advocates that we, as humans, are capable, relating and embodied subjects, but are at the same time vulnerable and uttermost limited by our biology. The vast medical-technical advances of the last century have created amazing possibilities to investigate and alter the biological body, but with the risk of undermining a person's experienced illness on behalf of the objective and measurable disease. Modern health care needs to embrace both. Third, the physiotherapy profession is rooted in both a medical and a humanistic paradigm, at times heading towards a biomedical view of the human body and at other times being concerned with the person's body as constantly interacting with the surrounding world.

Balancing at the crossroads of different scientific paradigms naturally creates friction throughout the planning, carrying out and synthesizing phases of my work with the thesis. However, my approach here is that the breach might form a creative interface for reflection upon the perspectives rather than a gap that separates. As such, the theoretical point of departure becomes, and continues, as a movement. And movement is, as the title of the thesis reveals, the central feature in the pages to follow.

INTRODUCTION

I felt very still and very empty,
the way the eye of a tornado must feel,
moving dully along in the middle of the surrounding hullabaloo

Plath, 1963 The Bell Jar

What is depression?

Feeling low, sad and sorrowful are natural parts of being human, intertwined in a changing flow of emotions and moods that colours our lives. However, if the depressed mood turns into a more constant, durable and disabling state of suffering, it is generally referred to as clinical or major depression (MD).

Recounts of depressive states can be traced through the history of mankind, but with different names, expressions and cultural status. From a historical perspective, Johannisson (1) has analyzed depression as embodied experience, how it takes different shapes into which the vulnerable self can withdraw. She interprets the expressions of depression as different through history, from the 17th and 18th centuries of outraging depression, through the sensitive, introspective and self-doubting depression of the 19th century, toward the empty, fatigued, burned out depression of our time. Central in the experience, transcending the historical context is that depression always seems to involve a sense of deficit, a tacit loss of something. Another core feature is the experience of alienation that conflicts with the relation to the surrounding world (1).

The modern psychiatric classification of MD is defined in the Diagnostics and Statistical Manual of Mental Disorders, DSM-V, (2) by the following symptoms: 1) depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g. feel sad or empty) or observation made by others; 2) markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation made by others); 3) significant weight loss when not dieting or weight gain (e.g., a change of more than 5 % of body weight in a month) or decrease/increase in

appetite nearly every day; 4) insomnia or hypersomnia nearly every day; 5) psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down); 6) fatigue or loss of energy nearly every day; 7) feelings of worthlessness or excessive or inappropriate guilt nearly every day (not merely self-reproach or guilt about being sick); 8) diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others); 9) recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide. At least five of the above symptoms have to be present over the past two weeks, causing significant distress or impairment of functioning in social or occupational activities (2). Among the symptoms, at least one of the core symptoms (depressed mood and loss of interest) must be present. Also, the symptoms should not be better explained by somatic illness or the effect of substance. A disputed change in the DSM-V compared to DSM-IV is the removal of the bereavement exclusion criteria, which meant that in the previous DSM-IV, persons who had lost a loved one during the last two months would in general not be diagnosed MD.

In the International Classification of Diseases (ICD-10) (3), more commonly used in primary care settings, the clinical diagnosis of depression is classified using almost the same criteria as in the DSM system. However, ICD-10 contains three diagnostic levels of depression severity, mild, moderate and severe, whereas the DSM-V does not diagnostically differentiate grades of severity. There are a number of clinical assessments and self-assessment scales that are used to assess depression severity and to evaluate treatment outcome. Some of the common scales in Swedish health care are: the Montgomery Asberg Depression Rating Scale (MADRS), observer-rated (4) or self-rated, (5) Beck's Depression Inventory (6) and the Hamilton Depression Rating Scale (7).

Qualitative research shows that experiences of depression are varied, describing the condition as elusive and contradictory, pervading the person's whole life-world and essentially involving a sense of alienation (8-10). Although depression impacts on a number of bodily functions including appetite, sex, movement, sleep and overall energy level, the relationship between depression as an embodied experience and depression as a medical condition is rarely addressed in research. This is interesting considering that the current diagnostic criteria are not based on biological measures but can be viewed as a statement about the phenomenological life-world of the patient (11), focusing on painful feelings (i.e.

consistent depressed mood or emotional emptiness) and on problems involving altered embodiment (i.e. psychomotor alterations, changes in sleep and appetite) and estranged engagement with the world (i.e. loss of interest). It has been argued that the classifications in the DSM system, developed as a means to a more neutral and consistent model of diagnosing psychiatric conditions, puts insufficient focus on dimensions related to environmental, relational and cultural contexts of the illness (12, 13). Incorporating mental health in a pure positivist orientation involves the assumptions that: a) mental illness arises from faulty mechanisms, physiological or psychological, occurring within the individual; b) these mechanisms can be modeled in causal terms, independent of context; and c) interventions are instrumental and can be designed and studied independently of relationships and values. Bracken et al. (13) emphasize that, besides the biological dimension, the nature of mental health reaches beyond the brain to involve dimensions that cannot be grasped through the epistemology of biomedicine. In addition, ethical and hermeneutic aspects of care and recovery are important for understanding the complexity of mental illness (13-15). For MD, this is particularly essential as the current classifications in both the DSM and ICD systems anticipate a perceptive, interpretative approach in the diagnosing health professional. The dynamics of different ontological and epistemological perspectives in mental health further supports this thesis' combined theoretical orientation.

Major depression in the world of today

Worldwide, epidemiological data show that MD is a commonly occurring and seriously impairing public health threat (16, 17). Recent findings from the Global Burden of Disease Study 2010 show that mental and substance abuse disorders are the leading cause of disability and that depressive disorders account for 40% of disability-adjusted life years among these conditions (18). Lifetime prevalence varies widely across countries, with a prevalence generally higher in high-income versus low- to middle-income countries. Estimates of lifetime prevalence range from about 7 to 20 %, with the highest estimate found in the United States (16). The 12-month prevalence of MD ranges between 2 and 10 % in different parts of the world (19). A consistent epidemiological finding across countries is that depression is twice as common in women as in men (16). Not only are women more likely to become depressed, they are also more likely to remain depressed (20). Moreover, it is common that other psychiatric and somatic illnesses co-exist with depression. In about two thirds of patients with

depression, mental disorders such as anxiety disorders, alcohol abuse and impulse control disorders are present. The co-morbidity between MD and anxiety disorders is particularly common: it has been estimated that approximately 60% of patients with MD also suffer from an anxiety disorder (21). MD is significantly associated with a wide variety of chronic physical disorders, such as arthritis, asthma, cancer, cardiovascular disease, diabetes, chronic respiratory disorders, and a variety of chronic pain conditions (16). Growing attention is being paid to the co-morbidity between cardiovascular disease and MD, an association proposed to account for a vast part of the high decrements in health and overall high morbidity (22, 23). There is good reason to believe that MD might be a causal risk factor to these physical disorders, and that co-morbid depression often leads to a poorer course of the physical condition. Consequently, the significantly elevated risk of death in depression is not only connected to the demonstrated high risk of suicide, but also to the associations with severe physical disorders (16). In Sweden, psychiatric diagnoses have recently become the leading cause of long-term sick leave and early retirement (24, 25), increasing especially among young women (26). MD is one of the most common diagnoses in this group. In summary, the commonness, societal burden and physical comorbidities of depression highlight a need to approach the body in depression.

The national recommendations, currently under revision, suggest first line treatment for adults in primary care to involve antidepressant medication, such as serotonin reuptake inhibitors and/or psychotherapeutic interventions, such as cognitive behavioural psychotherapy, interpersonal psychotherapy or short-term psychodynamic psychotherapy (27). In more severe or treatment-resistant cases, patients in Sweden are generally remitted to specialized psychiatric teams. In psychiatry, additional medical treatments such as light therapy (28) and electroconvulsive therapy (29). New treatments are under development, such as transcranial neurostimulation (30). Novel psychotherapeutic approaches such as acceptance and commitment therapy (31) or mentalization-based therapy (32) are other potential treatments. The multi-professional psychiatric team can also provide specialized inputs from occupational therapists, physical therapists, nurses and social workers.

Although the effects of recommended treatments are well documented, about one-third of patients with major depression do not remit within a year (33, 34). Also, relapse rates are high. To individualize treatment and alleviate the impact of MD, alternative treatment strategies are needed (27, 35). Health service providers need to relate to perspectives beyond the pure medical perspective of

depression (36) to facilitate the individual's personal pathway to recovery. Such a person-oriented approach, based on the patient's needs and aspirations can be considered a "shared care" process. In line with this, a person-centered approach is suggested in British National Institute for Health and Care Excellence guidelines for the treatment of depression (37).

Physical therapy in mental health

Physical therapists (PTs) in Sweden have been working in specialized mental health care since the mid 1960s (38). Today they are often part of a multidisciplinary team that aims at offering the patients more integrated and multifaceted care. Physiotherapists focus on the living body, where the body is perceived as entwined with the whole person and his/her existence. It is assumed that experiences of the body in movements and bodily sensations connect immediately and non-verbally to psychological and existential dimensions. Assessments and treatments are directed at the individual person's experienced symptoms, expectations and resources, rather than toward the patient's medical diagnosis. The field of psychiatric PT is inspired by phenomenology, body-oriented psychotherapy, psychosomatic medicine, body awareness, Eastern movement traditions and dance and movement pedagogy. Physical activity and exercise, different methods of body awareness training, mindfulness and relaxation training are commonly used methods (38).

From an international perspective, mental health physical therapy as a special branch of the profession is established foremost in Scandinavia and in Northern Europe. Since 2004, a growing network of physical therapists from all parts of the world has developed, called the International Organization of Physiotherapy in Psychiatry and Mental Health. The organization arranges regular scientific conferences and was recently given status as an official subgroup to the World Confederation for Physical Therapy (39).

During the past decade, organizational changes in Swedish health care have led to a shift of treatment setting, with persons with affective disorders such as depressive and anxiety disorders currently being treated mainly in primary care. Some research has been conducted in Scandinavia, investigating PT for affective disorders (40-43), but research in this area is still sparse, particularly in well-defined clinical samples. Several studies conclude that depression is a barrier to positive outcome of primary care PT treatment (44-46). There is a growing need to improve PT in primary care to understand and treat persons with depression

adequately, and to study PT as a potential adjuvant to evidence-based treatments for depression.

Physical exercise for depression

For more than a century, the documented use of physical activity and exercise has shown cognitive, emotional and physical improvements in depressed mood. Whereas physical activity is defined as any bodily movement produced by skeletal muscles, exercise means physical activity that is planned, structured and repetitive, aiming for improved or maintained physical fitness (47). Clinical research points to an antidepressant effect of exercise both as adjunct (48-50) and as stand-alone treatment (51, 52), although results of recent, methodologically rigorous studies are more cautious (53, 54). The most common exercise modality for depression is aerobic exercise at a moderate to high intensity (55), but low intensity practices, such as yoga or tai chi, also demonstrate positive effects (56). Suggested working mechanisms of exercise involve behavioral activation, social interaction, and increased self-efficacy, as well as neurobiological explanations related to neurotransmitters and cell growth (42-44). However, a consensus on the efficacy, modalities and dose relationships of exercise in depression is not yet established, nor are the active components satisfactorily explained. Overall, exercise for depression has been investigated with little regard to context and professional guidance. The role and impact of exercise as PT treatment, needs further exploration.

Basic body awareness therapy

Basic Body Awareness Therapy (BBAT) is a physiotherapeutic treatment method that originated in Swedish psychiatry during the 1970s and 80s (38). It has since gradually developed and expanded among physiotherapists in Scandinavia and Northern Europe. The movement-based method addresses the interaction of body and mind by the use of simple, slow movements and reflections on body experiences, aiming at enhanced awareness and quality of movement (57). An assumption in BBAT is that an increased awareness of the body increases the awareness of the self, opening for new possibilities to act and interact with other people. Besides movements, the treatment includes seated meditation and structured massage techniques, overall promoting an attitude of acceptance of one's body and experiences. Verbalizing and sharing experiences are essential parts of the process. However, for some persons, treatment can be mainly non-verbal. Several studies and dissertations have brought attention to BBAT during the past decades, for example in connection with psychotic disorders, eating

disorders and long-term musculoskeletal pain (58-61). Promising effects on depressive symptoms have been demonstrated in studies on psychiatric out-care patients (42) and in patients with irritable bowel syndrome (62). So far, there is little documentation on the effects of BBAT in relation to MD.

The concept of movement

According to the Merriam-Webster dictionary, movement means: the act or process of moving, as a change of place or position; action; trend; and the rhythmic and vibrant quality of musical, artistic or literary works. This shows that the concept of movement is multifaceted even in everyday language,

Medical doctor Carl Edvard Rudebeck describes physical therapists as “connoisseurs and accompanists” of human movement and interprets movement as a concrete and fundamental freedom to act (39). Although being one of the cornerstones of clinical practice, the concept of movement is surprisingly little explored within the field of PT. Shumway-Cook and Woollacotts (63) substantial theory on motor control and motor learning, frequently referred to in PT, introduces the concept of movement as an essential aspect of life, involving a complex interplay of several interacting systems. This broader view puts the model well in line with the current classification of functional diagnosis and treatment goals in PT, based on the International Classification of Functioning’s (64) three levels of body structure, activity and participation. However, the motor control theory limits its focus to the physiological and behavioral mechanisms of movement, with the overall aim to foster the ability to regulate and direct these mechanisms. The existential dimension of movement, tacitly present in PT interaction and experienced by most people in its most basic sense - that movement affects how we experience ourselves - is rarely discussed or conceptualized in PT theories. In mental health PT, the experience of movement is essential as it links the esthetic expression with the person’s psychological resources (65-67). Connected to BBAT, assessments focus on the central dimensions of movement, such as the person’s relation to the ground and to the vertical axis, breathing, coordination around the body’s movement center, flow of movement and mental awareness (68, 69).

Occasional studies have explored the phenomenological dimensions of movement in relation to PT. Wikström-Grotell and Eriksson (70) propose four qualitatively different, interconnected interpretations: movement as an absolute value, movement as personal value, movement as a means and movement as a

sensation of body and mind. Skjaerven et al. (65) suggest that movement quality goes beyond the physical expression and that physical therapists need to understand and practice a multidimensional awareness of movement. The therapist's own embodied presence is a precondition to guide the patient further through different phases that involve: establishing contact, exploring, experiencing, integrating, creating meaning, mastering and conceptualizing.

In dance and movement therapy, movement has long been regarded a fundamental expression of the essence of human life (71-73). Sheets-Johnstone (74) claims that "movement is not simply a sign of life, it is the preeminent sign of life" (p 3). Her definition of movement involves both the voluntary and the involuntary (breathing, sneezing and yawning) that experientially mean a *feeling of aliveness*. Attention to your own kinesthetic dynamics can awaken the sense of aliveness, as something that is not just happening to you but *moving* you. Sheets-Johnstone (74) refers to the spin-off residual of energized vitality following sport activities and suggests that this "life-proclaiming dynamic experience" can be the basic reason for the therapeutic potential of movement. She also claims that, in psychologically vulnerable persons, the experience of movement can be overwhelming or even existentially threatening, which might explain some of their reluctance to move.

Seemingly, PT theory could benefit from a more diverse and comprehensive understanding of the concept of movement. This lack is possibly linked to the profession's confusion of philosophical base (75, 76), historically rooted in the biomedical paradigm but embedding tacit knowledge of embodied communication and holistic views on health, in line with a humanistic perspective (75, 77).

Person-centeredness in physical therapy

Person-centered care emphasizes that a person seeking health care services is always, first and foremost, a dignified and capable person (78, 79). This approach shifts the focus from the disease as a categorization of patients, to the uniqueness of the person's lived experience of illness. In a conceptual analysis, Leplege et al. (80) describe the notion of person-centeredness in rehabilitation as historically connected to philosophical, societal, and medical trends post World War II, toward an increased focus on subjective experiences and personal involvement and participation. In relation to rehabilitation, the authors suggest that person-centeredness involves four main interpretations: a) a person's specific and holistic properties, with the assumption that all persons are unique and

do not necessarily share the same needs, or benefits, from rehabilitation; b) that the difficulties or illness are to be approached and worked with in a manner that connects to the person's everyday life; c) to focus on the patient as an expert on his or her own body, abilities and life context, with the overall goal to enhance participation and empowerment; and d) to recognize and approach the person beyond the disease.

Undoubtedly, the concept of person-centeredness is complex and encapsulates different components, not only in theory but in carrying it out (81, 82). Key components are suggested to involve respect for the person, to consider each person in their particular context and to facilitate the person to be an active participant through shared decision-making (83). Few professionals would oppose this perspective and for most physical therapists, it seems self-evident that person-centeredness grounds their everyday practice - something that they are already doing. Seemingly, modern PT is tacitly impregnated by person-centeredness. However, there are a number of challenges and grey areas of what constitutes person-centeredness in PT and whether it is truly underlying, systematically and thoroughly, clinical practice in general (83). First, the issue of person-centered goal setting and treatment plan, long considered a core requirement in PT, is problematic. The complexities of real persons in clinical encounters do not always "fit" the guidelines suggested by academia or health care policies. Although having the best of intentions, physical therapists can feel frustrated, for example when the patient's goals are perceived to be unrealistic or far from what it "should" be directed toward, or if the person is simply unable to identify any straightforward goal (84). Second, even though psychological and social aspects of the patient are acknowledged, PT is historically rooted in a biomedical paradigm. This means that physical therapists are, sometimes unconsciously, inclined to lean towards an error searching view of the body, with general assumptions about what is beneficial for the patient, who then becomes mainly a recipient of PT services. Third, we are utterly "do-ers". Not being able to actively "do" something with or to the patient can cause confusion and a sense of inadequacy in the physical therapist (83).

When designing the studies for this thesis, we employed procedures to involve three cornerstones of practicing person-centered care (79), further described in the methods section: a) initiating the partnership by the patient's narrative (using narrative-based interviews as data collection, and starting the interventions with individual encounters); b) working the partnership (emphasized in the intervention study with the physiotherapist functioning as a collaborative guide) and c)

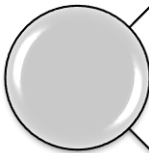
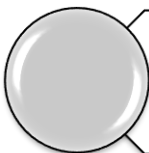
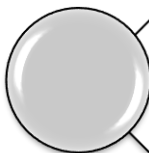
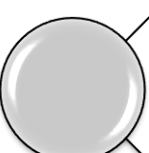
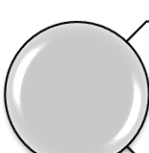
documentation (through personally designed, continually revised training programs).

Summing up: the rationales for this thesis

To sum up this introductory chapter, MD is a globally increasing burden from both individual and societal perspectives. In spite of effective pharmacological and psychological interventions, about one-third of the patients are insufficiently recovered. Movement-based approaches to treatment are as yet sparsely explored. This thesis contributes to the knowledge gap on movement-based augmentation strategies for MD, exploring a PT perspective. Involving diverse methodological approaches and emphasizing the patients' perspective, yet underexplored in research on depression (85), the thesis is anticipated to illuminate the embodiment of depression and to indicate whether movement-based strategies such as exercise and BBAT might play a role in a future multifaceted range of treatment options. Moreover, the project articulates knowledge about the person-centered dimensions of PT practice in relation to MD.

AIMS

The overall aim of this project is to explore a physical therapy perspective in the treatment of major depression, describing lived experiences and evaluating treatment effects. The project involves both qualitative and quantitative research methods and addresses the present knowledge gap in physical therapy for depressive disorders. It also addresses the implication and understanding of a person-centered approach in physical therapy practice. More specifically, the aims of the project are:

-  To examine the quality of evidence for aerobic exercise in major depression, comparing specific study types
-  To explore lived experiences of depression as an embodied phenomenon
-  To evaluate the effects of exercise or basic body awareness therapy, respectively, as add-on treatments for persons with major depression
-  To explore basic body awareness therapy as experienced by persons with major depression
-  To explore experiences of physical therapist-guided aerobic exercise in persons with major depression

THEORETICAL FRAMEWORK

Phenomenology and the lived body

The theoretical underpinnings in this thesis are inspired by phenomenological views on the lived body, mainly through the work of French philosopher Merleau-Ponty (86). He moves beyond the Cartesian model of the human body as a measurable object or a mere tool to the conscious psyche and claims that the body is what mediates our existence and relation with the world. This viewpoint means that the world, as we know it, is perceived, related to and made sense of through our own lived bodies.

The lived body is intentional, always directed to the world in meaningful engagement and action. The lived body is ambiguously experienced both as object and subject, at times distinguished more as an object and at other times directed toward personal acts, immersed and "disappeared" (87) into life's events and projects. We are normally rather unaware of our bodies, they are just there for us, facilitating and fulfilling our intentions. To exemplify the lived body as a movement between subject and object, we can consider the everyday situation of returning to home after work and preparing to open the front door. There are automatic, perfectly coordinated sensory and motor skills involved; putting down the bag, reaching for the key in the pocket, finding it without consciously searching (our mind might even be simultaneously contemplating the day or thinking about what to make for dinner), putting the key into the lock, turning the key and pushing the door open. The body is not the focus of my attention – it is silently carrying out the meaningful task of getting me inside the house. However, if there is some resistance in the lock, so that the key cannot turn smoothly and gets stuck for a while, it will catch my attention and I will immediately become aware of the metallic sense of the key, the hardening of my grip and muscular effort, perceiving the structures of my fingers as objects with skin, tissue and bones. Then my lived body will momentarily be perceived as object, just until the key eventually turns and my perception shifts back to my meaningful intention, as subject, of getting inside. Another classical example to grasp the dialectical relationship of the body as object and as subject is the act of pressing

my two hands together, creating a double sensation of both being the sensing subject and the sensed object.

In the view of Merleau-Ponty, nothing can be acted upon, perceived or appear to us outside of our lived bodies. In this sense, the lived body incarnates the conscious self or subject, constantly present in all our sensations, thoughts, communication and actions. It is not myself as subject that inhabits the body, it is the lived body as subject-object that inhabits my time and space, it is with me, to the world, taking it in.

This world that is Merleau-Ponty's focus of reflection is the phenomenological life-world, originally described by Husserl and later also an important notion in the work of Heidegger. The life-world constitutes the immediate reality that we experience concretely, prior to analysis or theoretical explanations and that carries fundamental meaning to our existence (88). Similar to Heidegger, Merleau-Ponty says that we are in constant and living relation to this world, which is there before all conscious reflection, inescapable to us. Thus, the life-world is not only the interest of philosophical analysis but simultaneously the foundation that makes reflection at all possible. In contrast to abstract conceptualizations, this vantage point entails a flexible approach to the complexities of our reality. It differs from a reductionist view of the world consisting of measurable things, but it also differs from the pure subjective point of view, constituted by the subject's consciousness. Rather, the intricate life-world in the view of Merleau-Ponty represents a third dimension, bridging between pure nature and pure subject as it embraces, and constitutes, both these perspectives (88). This circular relationship - the subject tinged by the world and the world by the subject - is not to be understood as a contradictory loop, but as a basic characteristic of the life-world.

This ontological viewpoint of the lived body and the life-world is used in this thesis as an enriching perspective to understand physical therapy for depression, as it puts the body as the basis for experience and possibilities and acknowledges the biological-existential dialectics of movement. The theories of Merleau-Ponty are advocated in several previous studies related to physical therapy for mental health problems and long-term pain (40, 89-92).

The lived body in depression

Leave the body, leave the mind
Every promise every place behind
I just happen to feel so alone
For today for all days to come
I just wanna be wanna be gone

Ternheim, 2004 To be gone

With the lived body as our access to the world, it makes sense that illness or injuries inevitably affect our access to the world. This assumption makes an important theoretical vantage point to understand MD from a physical therapy perspective – when our bodies fall ill, our ways to relate to the world will change. Contemporary phenomenological philosophers such as Svenaeus (11, 93) and Fuchs (94, 95) have extended Merleau-Ponty's ideas on the lived body in their analyses of the phenomenon of depression.

In depression, the lived body, normally quietly facilitating our projects in life, becomes restrained and disrupted (95, 96). The body is experienced as a restraining resistance to reaching out to and absorbing the surrounding world, reducing the person's ability to carry out even basic tasks and actions, and to interact with other people. This leads to a sense of detachment and disengagement, separating the person from his or her ongoing life and evoking guilt and doubts of self-worth.

Not only does the bodily constriction affect the subjective experience, it also narrows the possibility to empathically connect and communicate with people. The synchronized embodied expressions of gestures, posture and mimics that normally accompany communication and interactions are reduced (97). Vice versa, the ability to perceive such expressions in others is less fluent. Drawing on Merleau-Ponty, Fuchs (94) outlines that, when healthy, the lived body is always directed to other lived bodies, connecting to others through a mutual bodily "resonance" mediated by postural, facial, gestural and vocal expressions. My own body is affected by the other's expression, timing his or her emotions through my own sensations and movements. We are brought in by the peace

and stillness of a person truly at ease, and we sense our own tension and jerkiness of movements in the presence of someone who expresses nervousness. This mutual embodiment – that we are able to, non-verbally, “tune” into the emotional state of another person - is recently growing in interest in modern neuroscience, for example through the research of mirror neurons, showing the connection on a biological level (98). In depression however, this bodily resonance is narrowed, with the body “out of tune” (93), reducing the person’s ability to be affectively moved and engaged by events, people and things. It can be argued that some emotions are enhanced in MD, such as guilt, anxiety and despair. These emotions have in common that they separate the person from the world and from others, increasing the feeling of estrangement and withdrawal (93).

The embodied “in-between” makes humans perceive interpersonal climates such as warmth, ease or familiarity or, more negatively, coldness, awkwardness or tension. We pick up, and sometimes find ourselves overtaken by, charged atmospheres and shared emotional states through our bodily resonance. This mutual embodiment is recently described by Fuchs as *intercorporeality*, which impacts on *interaffectivity* in terms of the person’s expressing own and taking in others’ affects. These phenomena, fundamental as our empathic understanding of another human being and thus for interaction and engagement, are altered in depression (94).

It is noteworthy regarding the concepts outlined above, that the underlying phenomenological psychopathology of depression has a different focus than biomedical or cognitive psychological models. These models regard depression as an inner mental disturbance, primarily located within the brain of the individual, connected to negative cognitions that, secondarily, lead to bodily symptoms and affect social relations. The body then serves as a projection of the inner mind. This is reflected in both pharmacological treatments (to alter for example neurotransmitters) and in cognitive therapy (to alter thinking processes). Not contradicting, but transcending these perspectives, the phenomenological psychopathology recognizes depression as primarily a disturbance *in the way the person’s lived body mediates his or her fundamental contact to and with the world*. This does not oppose individual biological and cognitive deviations, but shifts the main focus to the relational sphere, with others and with the world. Similarly, emotions and moods in the phenomenological view are not introjections of a separated individual, but reside in between individuals, dependent on relations and interactions with others and things in the surrounding world.

The phenomenological analysis of the lived body in depression is significant to this thesis, to deepen the understanding of the experience of MD and of movement-based interventions.

Personalism

Theories on personalism contribute to this thesis by adding an ethical dimension to the understanding of embodied communication outlined above. Also, to address person-centeredness in PT, personalism as a foundation needs exploring. Here, the concept of person takes its departure in the works of philosophers such as Mounier (99), Ricoeur (100) and Buber (101). A person is a relating human being with feelings, wishes, needs, beliefs and responsibility. A person has subjective experiences, a durable identity, moral commitments and aims for a sense of communion (102). The essence of person is immersed in nature and culture, or as Mounier (99) puts it: “there is nothing in me that is not mingled with earth and blood” (p 9). In this sense, personalism agrees with the phenomenological view that my lived body is my exposition, my means of connecting and committing to the world. Essential in personalism, however, is the strong emphasis on the mutuality and dialogue between persons – that you become a person through meaningful relations with other persons. In Buber’s (101) understanding, the person appears in the relational sphere of “between” humans. This “between” is not a construction, but a real place and bearer of what happens between persons. It is only in a true “between” meeting with the other, in the eye and presence of the other, that I can fully recognize myself as a genuine person. The sphere represents human life through its dynamics and recognition of each other and can be viewed as a starting point to understand what a person is (101). In agreement, Mounier (99) suggests that a person is a living process of self-creation, communication and attachment - as a movement of *becoming* person. This differentiates “person” from the notion of a more separated and constant “individual”. Another essential aspect of personalism relates to the ethics of Ricoeur (100). Humans are, by their sheer existence, capable - “homo capax”. The capable human is, simultaneously, both able and vulnerable. Vulnerability in this sense is not a weakness, but constitutes human existence just as our possibilities. In this way, being a person means to be acting *and* suffering, possessing freedom *and* being bound by limitations. For the studies in this thesis, this view impacts on the understanding of the therapeutic partnership.

METHODS

In line with this thesis' proposed cross-section of theoretical positions, the methods involve both inductive and deductive approaches, resulting in papers I-V, which are schematically presented with regard to methods in Table 1 below. In this section, I will introduce and reason around the methodological approaches and procedures for the five separate studies and for the thesis as a whole. The methods are described in detail in papers I-III and manuscripts IV-V, see the appendix.

My work began with an explorative phase, to get acquainted to the field of research and to initiate a reflexive process about depression as a phenomenon. The basis of this preparatory phase was my ten years of clinical experience as a physiotherapist in psychiatry and primary care and a previously conducted study on PT for anxiety (103). Following this, I conducted in-depth interviews with four expert physiotherapists, who had vast clinical experience of treating persons with depression in psychiatric settings, primary care and private practice. Parallel to this, as depression is a complex phenomenon, I sought for different sources to deepen my understanding. This included scientific literature with medical, psychological, historical and philosophical perspectives, as well as arts, novels, poetry and music. My rationale for this broad field of inspiration was to test different angles to connect to, and to some level immerse into, what depression can mean to humans.

Study setting and participants

The empirical studies (II-V) were conducted in a primary care setting. The initial participants in study II were diagnosed by their ordinary treating physician and were recruited through clinical collaborators. For the main part of the participants in this thesis and the subsequent recruitment to studies III, IV and V, two strategies were employed. We contacted five primary health care centers, three located geographically close to the rehabilitation center and two located outside the immediate city center, representing a different socio-economical area. As this strategy resulted in few referrals, we advertised in two local morning papers, one of which is free of charge and distributed in various parts of the city. This strategy, repeated three times during a year and a half, was more successful in

attracting calls and emails from potential participants. The screening process involved a telephone conversation to provide information about the study and to ask questions about eligibility according to a pre-defined scheme (see paper III). Criteria for inclusion were that they were 18-65 years old and had been taking antidepressants for at least six weeks, prescribed by their ordinary physician or psychiatrist. Persons who were treated in specialized psychiatric teams were not included, nor were persons who were already exercising regularly. Psychotherapy was regarded as a criterion for exclusion if described by the participant as a psychological, methodologically structured treatment such as cognitive behavioral therapy or psychodynamic therapy. However, it is common in Swedish primary care that patients with MD have follow-ups and occasional supportive counseling sessions with nurses or social workers. These were not regarded as criteria for exclusion.

The participants who were found to be eligible after the screening received written information by mail or e-mail according to their preference and were booked for a diagnostic interview, the Mini International Neuropsychiatric Interview (104), conducted by a trainee in psychiatry. This interview corresponds both to the DSM-IV and to the ICD-10 criteria for a clinically relevant depression. It is also concluded by national evaluations to be one of the most valid and sensitive assessments for diagnosing MD (105).

Table I. Overview of studies I-V. GRADE= Grading of Recommendations, Assessment, Development and Evaluation.

STUDY	MATERIAL/ PARTICIPANTS	STUDY DE- SIGN	DATA COL- LECTION	DATA ANALYSIS
Study I	Published randomised controlled trials studying the effect of exercise on MD, n=14	Deductive, systematic review and synthesis of qualitative and quantitative data	Description of characteristics of studies and pooling data (depression severity)	Summary effect size calculating the standardized mean difference. The GRADE approach.
Study II	Adults 18-65 years with depression, n=11	Inductive, qualitative study	Individual interviews	Hermeneutic phenomenological approach
Study III	Adults 18-65 years with MD, n=62	Deductive, randomized controlled clinical trial	Observer-rated and self-assessed depression severity, anxiety, general functional ability, cardiovascular fitness and body awareness	Descriptive statistics, hypothesis testing using analysis of covariance (ANCOVA) and the Chi-square test.
Study IV	Adults 18-65 years with MD participating in BBAT, n=15	Inductive, qualitative study	Individual, interviews	Hermeneutic phenomenological approach
Study V	Adults 18-65 years with MD participating in physical therapist-guided exercise, n=13	Inductive, qualitative study	Individual, interviews	Qualitative content analysis

Study specific methods

Systematic review and meta-analysis

The focus of study I was to evaluate the current evidence for physical exercise in the treatment of depression, comparing exercise to different types of controls. This was conducted as a systematic synthesis and review of published clinical trials in the area of exercise for MD. The procedure began with systematic searches in the most common electronic databases of clinical research, searching for randomized controlled trials studying exercise as an intervention for patients with a diagnosis of MD without any obvious co-morbidity and assessed for MD with any pre-defined diagnostic criteria. A stepwise procedure followed, reviewing a) titles and abstracts and b) the retrieved full-text articles potentially eligible for inclusion. Studies that were included (n=14) were thoroughly read and assessed, independently by two raters, for methodological quality using the Cochrane Risk of Bias protocol (106). Subsequent to this assessment, we used the well-established model Grading of Recommendations, Assessment, Development and Evaluation (GRADE) (107) to estimate the pooled effect and evaluate the quality of evidence across studies. This assessment has recently been recommended and utilized by the Swedish Council on Health Technology Assessment (SBU) (105). This study functions as an explorative part of how exercise has previously been investigated in relation to depression and what conclusions can be drawn regarding the effects. The analysis of results is discussed in relation to where future research needs to be directed, hence suggesting a rationale for this project's intervention study (study III).

Randomized controlled trial

In study III, we wanted to create and evaluate PT interventions as add-on strategies to antidepressant medication, based on findings from studies I and II. The main components we wished to address were that the intervention would engage body and movement and that a person-centered approach would be emphasized. Moreover, we wanted the intervention to be close to everyday practice in primary care rehabilitation, to increase external validity and future implementation.

A deductive, hypothesis-testing approach was used to evaluate the effects of two different active PT interventions compared to a control session of advice on physical activity, as add-on strategies for MD. The two experimental conditions in this randomized controlled trial, aerobic exercise and BBAT, were chosen for

the following reasons: 1) they are movement-based treatments, in line with movement as a core concept in PT; 2) they are commonly used in clinical practice; 3) results of study I (and other reviews) cautiously support aerobic exercise for depression, warranting more studies, whereas for BBAT, few controlled studies exist; 4) both treatments would facilitate and possibly embed specific features of a person-centered approach on the basis of their embodied, dialectical collaboration with the physical therapist. The hypothesis was that the two active arms would improve significantly compared to the control group for all outcomes.

The observer-rated depression severity was the primary outcome of the trial. The trainee in psychiatry who conducted the diagnostic interviews, blinded to the participants' group assignment, assessed this outcome using the Montgomery Asberg Depression Rating Scale (MADRS). He also assessed functional capacity using the Global Assessment Scale of Functioning (GAF). Additional outcomes were self-rated depression severity, anxiety symptoms, body awareness and cardiovascular fitness. The assessments are schematically described below in Table 2.

The primary analysis was made using the intention-to-treat population, including all randomized participants. Secondary, a per protocol analysis was performed, including all subjects who did not deviate in any major way from protocol, who adhered to their designated treatment with at least 50% attendance and completed follow-up assessments. The continuous data of the efficacy variables were analyzed using a univariate general linear model, ANCOVA, in which treatment was used as a fixed factor and the baseline values as a covariate in the model. Pairwise comparisons followed, adjusted using the Bonferroni correction. The remission and response rates were also calculated and for these categorical outcomes, the Chi-square test was used. The significance level was set at 0.05 for all tests.

Table 2. Measurements used to assess the efficacy variables in a randomized controlled study comparing different physical therapy add-on strategies in the treatment of major depression.

<i>Efficacy variable</i>	<i>Assessment</i>	<i>Short description</i>	<i>Psychometrics</i>	<i>Pros for this project</i>	<i>Cons for this project</i>
<i>Depression severity, observer-rated</i>	Montgomery Asberg Depression Rating Scale	Ten items reflecting key characteristics of depression, max score of 60	Sensitive to change. Internal consistency, Cronbachs alpha $\alpha = 0.9^1$	Common in Swedish clinical practice, quick.	Less known outside Europe. No statements for uneven scores.
<i>Depression severity, self-rated</i>	Montgomery Asberg Depression Rating Scale – Self-rating	Nine items reflecting key features of depression, max score of 54.	Internal consistency $\alpha = 0.84^2$	Common in Swedish clinical practice, quick.	Same as above.
<i>Functional capacity</i>	Global assessment of functioning	A scale of 0-100, 100 representing extraordinary high occupational and social function	Interrater reliability: 0.62-0.96 ³ Discriminant, concurrent validity ⁴	Common in Swedish psychiatry	Sensitive to assess functional change over ten weeks?
<i>Anxiety</i>	Beck's anxiety index	21 items and a four-grade Likert scale. Max score is 63.	Internal consistency $\alpha = 0.92^5$	Well-established world-wide, easy to use	Reflects anxiety co-morbidity?
<i>Body awareness</i>	Scale of Body Connection: the body awareness subscale	11 statements with a five-grade Likert scale. Max score is 33.	Internal consistency $\alpha = 0.83$, construct validity = 0.89 ⁶	Recommended in review	Not validated in Swedish, or in depressed population
<i>Cardiovascular fitness</i>	Åstrand's ergometer test	6-minutes cycling with submaximal effort, heart rate and perceived exertion is registered	Test-retest $\alpha = 0.96$, concurrent validity = 0.79 ⁷	Quick, well-established, rarely unpleasant due to submaximal effort	Estimation of oxygen uptake based on heart rate. Less accurate in small populations

¹ Carmody et al. 2006. The Montgomery Asberg and the Hamilton ratings of depression: a comparison of measures. *Eur Neuropsychopharmacol* 16:601-11, ² Fantino & Moore, 2009. The self-reported Montgomery-Asberg depression rating scale is a useful evaluative tool in major depressive disorder. *BMC Psychiatry* 9, 26, ³ Burlingame et al. 2005 Selection of outcome assessment instruments for inpatients with severe and persistent mental illness. *Psychiatr Serv* 56:444-51. ⁴ Pedersen & Karterud 2012. The symptom and function dimensions of the Global Assessment of Functioning Scale. *Compr Psychiatry* 53:292-8, ⁵ De Beurs et al. 1997. Convergent and divergent validity of the Beck Anxiety Inventory for patients with panic disorder and agoraphobia. *Depress Anxiety* 6:140-6. ⁶ Price & Thompson, 2007. Measuring dimensions of body connection: body awareness and bodily dissociation. *J Altern Complement Med* 13:945-53. ⁷ Ratter et al. 2014. Several submaximal exercise tests are reliable, valid and acceptable in people with chronic pain, fibromyalgia or chronic fatigue: a systematic review. *J Physiother* 60:144-50.

Qualitative studies

Study II and IV were conducted using a hermeneutic phenomenological approach (108, 109), exploring depression as an embodied phenomenon (II) and exploring lived experiences of basic body awareness therapy in persons with MD (IV). The rationale for choosing a methodology that integrates hermeneutics and phenomenology was a wish to explore the immediate and intuitive life-world of the participants, explicating the meanings of living with depression in everyday existence in a way that involves both the immediateness of experiential accounts and the symbolically expressed descriptions embedded in lived experiences (110). Here, the hermeneutic phenomenological approach acknowledges that lived experiences are not isolated facts that are randomly stumbled upon; they are already there, meaningfully - hermeneutically - experienced in the intentional life-world. Moreover, when lived experiences are captured in spoken and written language, as in the research process of going from the experiences themselves to describing them, they inevitably become part of an interpretative movement already present in the interaction between researcher and participant. The interpretative dimension is also present in the approach to the researchers' subjectivity. With a hermeneutic phenomenological attitude, pre-understanding is regarded necessary in order to understand something (109, 110). However, the pre-understanding in terms of conceptualizations, beliefs, prejudices and previous experiences must be dealt with so that it does not overshadow the "voices of the life-world" (109), which here means the participants' experiences. This is crucial for enhancing openness to the phenomenon of investigation, enabling to see it in a new way. Some phenomenological researchers refer to the process of suspending the researcher's pre-understanding as "bracketing", putting it into brackets. Others emphasize that the pre-understanding rather needs to be held "deliberately at bay" (110) (p. 47), or "bridled" (109), a metaphor from horse riding that implies that the pre-understanding is not ignored, but gently controlled and challenged, creating a humble and curious, yet dwelling stance. We aimed at practising an open, reflective and "bridling" attitude toward our pre-understanding during the research process. To achieve this, we worked continuously with questioning our own assumptions in relation to the phenomenon and to the data, with the help of a reflexive journal and through discussions with patients and clinical collaborators.

In study II, we explored lived experiences of the embodiment of depression by analyzing narratives of 11 persons currently enduring a depressive episode. In phenomenological research, sampling is strategic and purposive rather than

random. The participants invited are strategically chosen, assumed to be able to share examples of experiences that will enrich the understanding of the phenomenon. Initially, we invited clinical patients through clinical collaborators, but to increase the speed of recruitment and the variation of participants' experiences, we decided to also invite participants who took part in the RCT. The data were collected through semi-structured interviews, recorded digitally and subsequently analyzed using a hermeneutic phenomenological approach.

For study IV, exploring lived experiences of BBAT in persons with MD, the sample consisted of 15 participants who had received a treatment period of BBAT through the randomized controlled trial (study III). Similar to what was done in study II, the data were mainly collected using semi-structured interviews, but here we added the possibility for the participants to engage in some BBAT movements with the interviewer during the interview. This element was created to help the participants recall their experiences of treatment, enhancing the immediateness of described experiences, and as a means to further immerse into and take part in their life-world and the context of their treatment. In addition, the joint movements generated a co-construction of non-verbal data, felt in the body of the interviewer, who was able to return and reflect upon these experiences while listening to the recordings. In an attempt to capture the "negative" experiences of BBAT in a richer manner, two written reports by participants who had chosen to drop out were added to the data material.

For the analysis of studies II and IV, we followed the procedure described by van Manen (108) and Dahlberg, Dahlberg and Nyström (109), characterized by initial naïve readings to grasp the overall sense of the interview, trying to enter the world of the participants. A systematic, structural analysis followed. This meant to identify meaning units in the transcribed interviews, then to condense these units in a way that captures embedded meanings and to reflect upon these meanings and their structure. The interpretative work involved relating and challenging the researchers' pre-understanding and subjectivity, guided by the phenomenological attitude of openness to the previously unseen, and to reflexivity. Parallel to the analysis, readings of phenomenological and other scholarly and biographical literature relating to the experience of depression and of movement deepened the interpretative dimension of the analysis. This part of the analysis was viewed as a dialogue with theory in order to transcend previous understandings - what is already familiar about the experience of depression (study II) and of BBAT during depression (study IV).

Study V was designed to further explore the exercise intervention in the randomized controlled trial, deepening our knowledge of the intervention beyond the statistical data, by turning to the patients' perspective. This was not merely an attempt to address the intervention from different perspectives, but also to develop reflections that had emerged during the previous studies, related to the therapeutic relationship and to body experiences. Thirteen participants from the exercise arm of the trial were included. For this study, qualitative content analysis was employed, a commonly used method well suitable for various types and depth of data. Here, the method was used to describe the content meaning of the participants' experiences, identifying similarities and differences expressed in the interviews both as manifest content (i.e. the content close to the participants' descriptions) and as latent content (i.e. the underlying content that is expressed on an interpretative level) (111). The reason for using a different methodology than the previous qualitative studies in the thesis was mainly that the five first interviews were conducted and analyzed using content analysis as one of the co-author's Bachelor's thesis. Thus, it seemed logical to continue using the same method when expanding into the present study, V.

Ethical considerations

The ethical principles of the Helsinki Declaration (112) state that medical research on human subjects must be based on careful considerations of predictable risks and foreseeable benefits for the subjects. The importance of the research question and anticipated benefits need to clearly outweigh the risk and burden for the subjects, and, for the risks involved, measures should be taken to minimize them. Since major depression not only causes strong distress for the individual but is also associated with self-harm ideations and actions, the emotional vulnerability of the participants was an important ethical concern. Therefore, we designed the intervention study (study III) as an add-on experiment, which meant that the participants were taking antidepressant medication at enrolment, prescribed by their ordinary physician or psychiatrist. The medical doctor of the research group assessed the suicide risk for each participant, to exclude persons with high risk. To minimize the risk that the participants' mental health would decrease radically, we followed up their depressive state during the intervention (at five weeks). We also encouraged the participants to report any aggravated symptoms, either to the physical therapist leading the group, or to the study coordinator. The participants were offered to take part in the intervention of their choice, subsequent to follow-up, as a post-trial provision (112).

Moreover, as this thesis involves a person-centered perspective, the ethics relating to personalism were important. This mainly concerns the underpinning concept of person (the capable yet vulnerable dimensions of being human) and to the relation between persons (the power of connection and mutuality), which has implications for the therapeutic partnership, as well as the participant-researcher partnership. Examples of how ethical concerns were reflected and acted upon with regard to personalism are: a) the process of exploring patients' perspective first (study II) and letting these findings guide the interventions of the deductive study III; b) the recruitment strategy based on voluntary responses to an advertisement, embedding a view of capability and free will in the subjects; 3) the personal meeting with the study coordinator at enrolment, who the participants could contact during the study, meant to facilitate the participants' sense of being seen, and d) the open, narrative and collaborative approach in the qualitative studies to enhance the connection between researcher and participant, using few themes to encourage the participant to steer the course of the conversation. All participants in this PhD project were ensured confidentiality and that participation was voluntary, including the right to withdraw without any consequences. After having received oral and written information about the project, the participants signed an informed consent before enrolling. The Ethical Review Board of the University of Gothenburg approved the project, registration number 027-12.

RESULTS

Here, I will present the main findings of each study and how they, from different scientific perspectives, both generate knowledge and raise new questions. I will then attempt to relate the results from the five studies to each other. For more detailed results of each study, see papers I-V in the appendix.

Study specific results

Study I

Fourteen eligible studies were retrieved, following in total 1,139 participants. Study sample sizes ranged from 23 to 202. Methodological quality was high in nine of these studies. Data for the outcome depression severity were extracted from all studies and pooled using the three comparisons: 1) aerobic exercise vs. antidepressant medication; 2) aerobic exercise vs. any physical activity control; and 3) aerobic exercise as augmentation to treatment as usual vs. treatment as usual control. For the first comparison - exercise compared to antidepressants - the pooled estimate of the standardized mean difference (SMD) was -0.06 with a 95% confidence interval (-0.36 to 0.23). The results suggest that there is no significant effect of exercise compared to antidepressants regarding depression severity. For the second comparison, the pooled SMD was 0.01 with a 95% CI (-0.23 to 0.24), suggesting that there is no significant difference in effect between the two interventions regarding depression severity. For the third comparison, the pooled SMD was -0.44 with a 95% CI (-0.79 to -0.09) and no substantial statistical heterogeneity. This estimate corresponds to Cohen's definition of a small, on the verge to moderate, effect. The estimate means that, on average, depression scores are 0.44 of a standard deviation lower in patients randomly assigned to exercise as augmentation to treatment as usual compared to those assigned to a treatment as usual control group.

To summarize, study I concluded that exercise appears to be beneficial for depression when used as add-on treatment and compared to treatment as usual. However, the grade of evidence was low according to the GRADE assessment. In addition, we found that, when exercise was compared to an active control that involved some kind of movement, such as low intensity walking, meditation

or stretching exercises, there was no difference between the effects of the exercise and control condition. This finding had a moderate grade of evidence. One interpretation of this finding was that, potentially, the actual act of engaging in movement, with less regard to modality, frequency or intensity, has an effect on depression, possibly by enhancing a mind-body interaction and/or feeling supported by professionals in the study. Our findings suggest that the focus on moderate to high aerobic exercise as a proposed modality for depression might be overestimated. Moreover, it directed our attention to less explored mediators of effect, such as body experiences and mind-body interaction, pointing to a need of further investigations, from different perspectives, of exercise for depression.

Study II

The results of study II describe the embodied experience of depression as an *ambiguous striving against fading*. This means a striving to overcome the paralyzing resistance and numbness that permeate activities, relations and self-perception in depression. The ambiguity lies in that the striving sometimes concerns forcing through the resistance and at other times respecting the urge to withdraw. Here, the withdrawal is not merely a symptom to master, but carries a complex meaning of also connecting to gathering and retrieving oneself, as a sheltering pause from life. The participants' experiences of using their bodies in different physical activities as a means to sensing life were salient in the results, thoroughly expressed in one of the subthemes. This part of the results further supports the ideas in the discussion of study I, proposing that experiences of the body in movement challenge the standstill of depression, potentially alleviating depressive symptoms. An additional thought emerging from the results of study II was the significance of the relation between the patient and the health professional. The professional's perceptive and respectful approach to the patient as person, with both vulnerable and capable sides, was emphasized. Especially, the results suggest a need for health professionals' sensitivity to the inner conflict of the patient's struggling with withdrawal.

Five subthemes illustrated different facets of the embodiment, three of which were interpreted as disabling – feeling confined, feeling estranged and feeling burdensome – and two of which were seen as enabling recovery – sensing life and seeking belongingness. The disabling and enabling qualities of the subthemes are visualized in Figure 1 below.

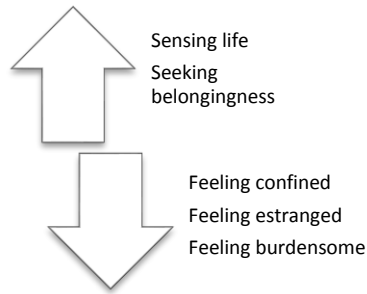


Figure 1. Disabling and enabling embodiment features in depression, from a qualitative study exploring lived experiences in persons with MD. Modified figure from Danielsson & Rosberg, 2014, published in the Scandinavian Journal of Caring Sciences (paper II).

Study III

The add-on aerobic exercise intervention, using a person-centered approach in a PT context, significantly reduced primary outcome depression severity (mean change in MADRS score was -10.3 with a 95% confidence interval -13.5 to -7.1, p -value=0.038) and increased cardiovascular fitness (mean change was 2.4 ml oxygen/kg/min with a 95% confidence interval 1.5 to 3.3, p =0.017), in an intention-to-treat (ITT) comparison across groups using analysis of covariance (ANCOVA). For all other outcomes, anxiety symptoms, functional capacity and body awareness, there were no differences between the groups although trends toward improvement could be observed in the two active arms, see Table 3 for details. In the per protocol (PP) analysis, including only participants who followed the protocol and had at least 50% attendance, results of the ITT analysis were confirmed. In addition, the PP analysis showed that both exercise and BBAT improved self-rated depressive symptoms compared to the advice group.

Table 3. Mean changes in efficacy variables for the three groups, for the intention-to-treat (ITT) and per protocol (PP) populations, analyzed by analysis of co-variance (ANCOVA). Values are estimated marginal means with standard errors. BBAT=Basic body awareness therapy, MADRS=Montgomery Åsberg depression rating scale, GAF=Global assessment of functioning scale, BAI=Beck's anxiety index, SBC=Scale of body connection. Danielsson et al. 2014, published in the Journal of Affective Disorders (paper III).

	ITT				PP			
	Exercise n=22	BBAT n=20	Advice n=20	p- value	Exercise n=18	BBAT n=14	Advice n=15	p- value
Depression severity								
MADRS	-10.3 ± 1.6	-5.8 ± 1.7	-4.6 ± 1.7	0.038	-12.8 ± 1.6	-8.4 ± 1.8	-5.1 ± 1.8	0.012
MADRS-S	-7.2 ± 1.4	-4.2 ± 1.5	-1.8 ± 1.5	0.034	-9.5 ± 1.3	-6.6 ± 1.5	-1.4 ± 1.5	0.001
Global function								
GAF symptom	6.9 ± 1.7	2.8 ± 1.8	3.8 ± 1.8	0.236	8.2 ± 2.1	3.9 ± 2.3	4.2 ± 2.4	0.293
GAF function	7.5 ± 1.7	2.2 ± 1.8	3.2 ± 1.8	0.075	9.2 ± 2.1	2.7 ± 2.3	3.2 ± 2.4	0.075
Anxiety								
BAI score	-3.6 ± 1.4	-5.0 ± 1.5	-3.4 ± 1.5	0.715	-5.9 ± 1.8	-7.9 ± 2.0	-1.6 ± 2.0	0.078
Body awareness								
SBC	1.9 ± 1.2	3.6 ± 1.3	2.1 ± 1.3	0.603	2.5 ± 1.4	4.2 ± 1.6	1.8 ± 1.6	0.583
Fitness								
Max oxygen uptake (ml/kg/min)	2.4 ± 0.4	0.8 ± 0.5	0.8 ± 0.5	0.017	3.0 ± 0.5	1.1 ± 0.5	0.5 ± 0.5	0.003

The changes from baseline to follow-up in observer-rated depression severity for each individual participant in the three groups respectively are visualized below in Figure 2.

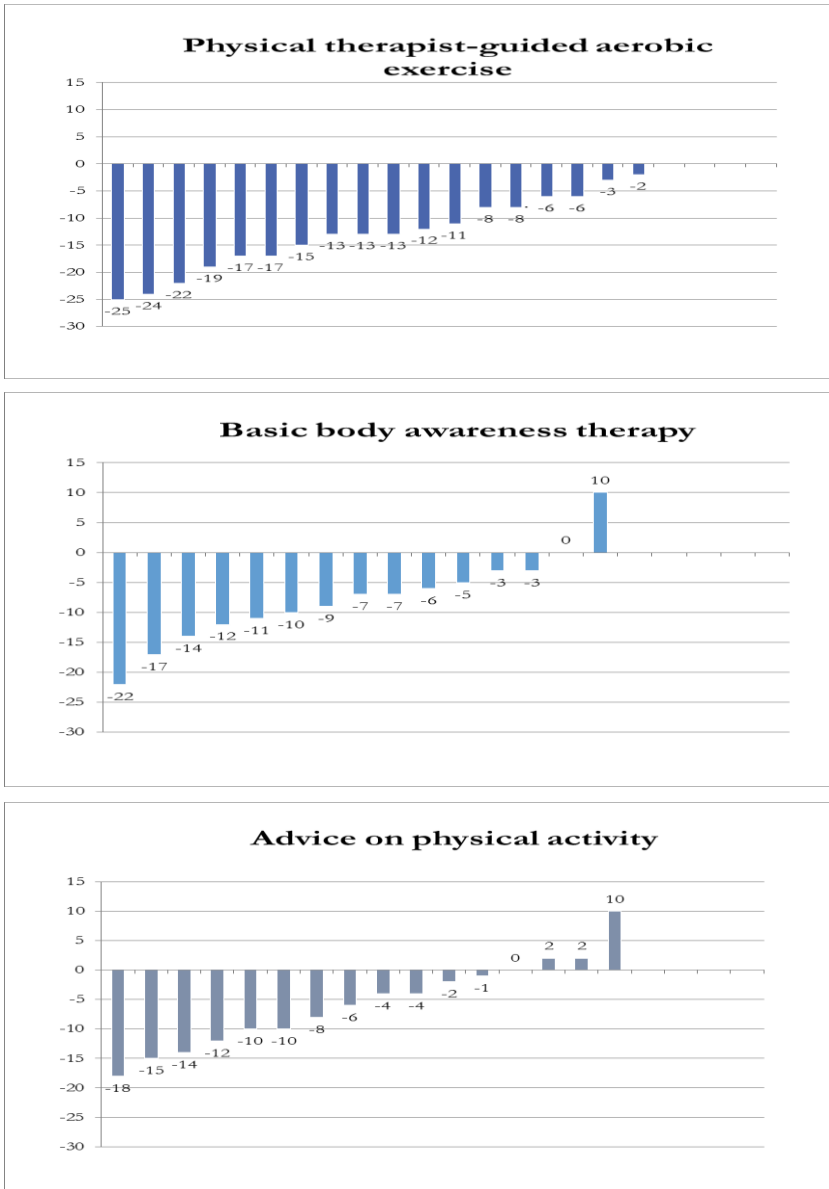


Figure 2. Results of the primary outcome depression severity in a three-armed randomized controlled trial comparing physical therapy add-on strategies in major depression. Each bar represents one participant’s change on the Montgomery Asberg Depression Rating Scale, ranging from 0-54 points. Baseline mean value in the sample was 24. A negative value of the bar means a reduction of severity; the higher the negative value, the greater the improvement.

Study IV

The essential theme *opening toward life* emerged from the analysis, reflecting the meaning of the participants' experiences of BBAT. The enhanced opening meant a process of gradually attuning more to both inner sensations and emotions and to impressions from the outer world, including other people. This was mainly a welcome experience in the numbness of depression, but caused distress in some. To sense more could also mean to sense more pain, and the integration of this dissymmetry was handled differently among the participants, for two resulting in them dropping out of treatment. Five constituents to the essential theme were described and visualized with examples of quotes in Figure 3 below. *Vitality springing forth* meant an enlivening experience, in a basic and immediately physical sense that could involve for example more vigorous walking, sighs and yawns, stretching and releasing stiff muscles. The vitality expressed could also be sudden emotions springing forth as a result of the training. *Rooting oneself* meant an experience of anchorage, stability and trust that was both physical and mental. *Recognizing patterns in one's body* meant that the participants related immediate experiences from treatments to their life outside the treatment room and recalled embodied memories from the movements. This recognition gave insight into how their bodies were intertwined with their lives and well-being. *Being acknowledged and allowed to be oneself* meant a relieving experience of acceptance in the group and by tacitly knowing that the physical therapist was present, guiding with directness, flexibility and empathy. *Grasping the vagueness* meant an experience of BBAT as a foothold, through which the experience of the self becomes more distinct, engaged and empowered.

The results were theoretically inspired by the Heideggerian notion of the Dasein as the fundamental human openness that serves as our capacity to engage and be engaged with the world (93, 113, 114).

Vitality springing forth	<ul style="list-style-type: none"> • I caught myself yawning unhibitedly the last group sessions, I just couldn't hold the yawnings back, and that felt great to yawn loud and clear, it felt great for my body to do that. Before, I had restrained myself.
Rooting oneself	<ul style="list-style-type: none"> • Well, I feel lighter but heavier (laughs)...it's hard to describe in words but it feels like you're more, whole. A whole. You feel lighter but at the same time more stable.
Recognizing patterns in one's body	<ul style="list-style-type: none"> • Suddenly I felt like the penny dropped, so <i>this</i> is how it can be, it's like I've known that it's there, <i>now</i> I know what to search for. I got a different understanding of what we were doing.
Being acknowledged and allowed to be oneself	<ul style="list-style-type: none"> • For two afternoons every week, it felt OK to be ill. It was accepted, it was in a way scheduled in my life. Something for me, twice weekly, when I can rest from all that's not possible in my life.
Grasping the vagueness	<ul style="list-style-type: none"> • Something is bound to happen, I feel that I try so hard. And when I doubt myself, at home, I say to myself that, well, at least I'm trying this now, I'm <i>doing</i> something.

Figure 3. The five constituents of the essential theme opening toward life, with example of quotes, showing the results of a study exploring experiences of basic body awareness therapy in persons with major depression.

Study V

The participants' experiences of physical therapist-guided aerobic exercise were thematically interpreted as an experience of *setting one's own capabilities in motion*. This meant that the intervention sparked a concrete feeling of being capable and "carrying out" intended actions – in terms of the immediate movements, but also spilling over onto other areas of life, facilitating social relations and practical tasks following the exercise. This theme embraced three categories, visualized in Figure 4. *Recapturing aliveness* meant that sensations of being alive emerged from the exercise, in a physical responsive way such as warmth, softness, pounding heart and paced breathing, but also in the sense of retrieving parts of one's "matter" and identity. *Feeling pleased about pushing through the resistance* was strong in the material and meant that that succeeding to actually managing to come to the sessions and pull through the exercises gave an important glimpses of pride and self-worth. *Finding the way through collaborative support* concerned the participants' experience that although exercise felt good for many reasons and was considered something they "ought to do" - they just cannot do it alone. An empathically perceptive physical therapist, waiting for you to show up and guid-

ing through sensitively pushing and pulling, was viewed as essential. The significance of the other group members varied among the participants: for some it was another essential aspect of feeling supported, for others it had less importance.

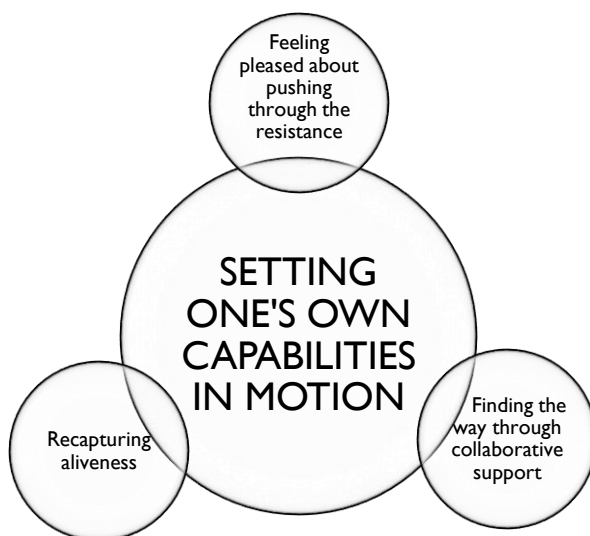


Figure 4. Visualization of the results in a qualitative study exploring patients' experiences of physical therapist-guided exercise in the treatment of major depression. Figure shows the theme and its subordinate categories emerging from the analysis.

Summary: synthesizing findings

The results overall suggest that exercise in a PT setting, using a person-centered approach, alleviates depression severity and increases cardiovascular fitness. BBAT reduces self-assessed depression severity. In addition, results of qualitative studies propose two central ideas to deepen the understanding of these effects. The first is that the embodiment of a depressed person seems to be altered following movement-based treatments such as exercise and BBAT, enhancing the person's access to perceiving the world by mediating aliveness, capability and openness toward others. The second is that the interaction and embodied dialogue between patient and therapist, and to some extent between co-participants, is essential for therapeutic change.

Study I concluded that add-on aerobic exercise has a small, verging on moderate, effect on depression severity compared to treatment as usual. However, as the exercise had no effect if compared to active controls using some kind of physical activity, the results evoked questions related to whether the movement, and its body-mind interaction, in itself mediates the effect. Study II gave insight into how the embodied experience of depression is described among persons who live it. These results supported that a person's embodiment is essentially altered during depression, in a narrowing and resisting way, which lead us to reflect upon movement and perception as potential channels to reconnect to the experience of vitality. Study III found that physical therapist-guided exercise, significantly reduced depression severity and improved fitness compared to generic advice on physical activity. BBAT significantly reduced self-reported depressive symptoms among participants following the protocol. The results did not support our previous idea of a mediating body-mind interaction, but evoked questions related to non-specific factors of the treatments, such as the therapeutic approach and context. These reflections were further explored in studies IV and V, where the participants' experiences revealed that the social climate of the group, the structure and the therapeutic relationship with the physical therapist, make all the difference in how the intervention is perceived and how motivation is maintained. Moreover, results of both studies described enhanced aliveness and vitality through movement. However, participants in the BBAT group described more of an enhanced openness to the outside world and in relating to others, as well as an increased self-reflection on personal habits and identity. Participants in the exercise group emphasized the enlivening experience of being capable, as a positive sensation of taking care of one's whole health, both body and mind. In both studies IV and V, the experience of one's lived body in movement, facilitates aliveness and potential, preconditioned by a supportive therapeutic relationship. The main findings of the five studies and reflections emerging during the research process are visualized below in Figure 5.

Figure 5. Main findings and questions emerging from the five studies in the thesis *Moved by movement: a person-centered approach to physical therapy in the treatment of major depression*.

I. Exercise seems beneficial as add-on strategy, but is supported by low grade of evidence

- Are effects mediated by mind-body interaction?
- Modality seems less important?

II. The embodiment of depression means an ambiguous striving against fading

- Can "sensing life" through movement mobilize the striving?
- How can PT's support this process?

III: Add-on aerobic exercise in a physical therapy setting improves depression severity and fitness

- What is essential for good outcome?
- How can lack of outcome be understood?

IV: Experiences of basic body awareness therapy are understood as an enhanced perceptual openness

- Both positive and negative?
- Explore motivation, dosage, modality!

V: Experiences of physical therapist-guided aerobic exercise means to set own capabilities in motion

- Perceived capability and aliveness mediate changes?
- Collaborative support essential - doing together!
- Implementation and access?

DISCUSSION

The following section consists of two parts. First, the methods of the five studies are reflected on, which is followed by a discussion of the methodological approach of the thesis as a whole. Second, a synthesis of the main findings is discussed, relating the five studies to each other and proposing ideas for implications and future research.

Methodological concerns

Study I

Conducting a systematic review of the effects of complex interventions, such as exercise, comes with several methodological challenges. The designs of the studies included are heterogeneous in terms of modality, intensity and frequency, and not least, regarding so called non-specific factors such as professional support, working alliance and exercise settings. However, one central idea in our four comparisons was to compare studies depending on type of control, as previous reviews have mixed flexibility training and meditative control conditions with non-physical controls, overlooking the potential mediator of movement. Our comparison of studies in terms of design thus had a rationale, but led to a small number of studies, and consequently a small number of participants, for each comparison. This most certainly impacted on the results.

Strengths of the review were that all studies included had used diagnostic interviews in their recruitment process and that we used established assessments for methodological quality and grading evidence. The GRADE approach is a complex assessment that, in retrospect, warrants more experience and knowledge in the research group. During the study, we therefore consulted the international GRADE working group to receive advice on the analysis and interpretation of results.

Studies II, IV and V

For the qualitative studies, the handling of my subjectivity as a researcher was a critical concern. This was addressed through: a) philosophical literature to deep-

en my understanding of the ontological and epistemological underpinnings behind the qualitative research perspective; b) the use of a reflexive journal and c) shared analysis and discussion with co-researchers. The reflexive journal was used to outline my pre-suppositions and assumptions at the start of the study. Trying to explicate my pre-understanding was thought of as a means to increase awareness of assumptions that I would need to “bridle”, not to let them blind me from seeing new things in the participants’ experiences. I returned to these assumptions during data collection and analysis to reflect upon and challenge them. The reflection of my pre-understanding was enhanced by the collaboration with my co-analysts in the respective studies.

The contextual elements of this type of life-world-based research can be a limitation, if neglected. For example, the participants’ experiences of the interventions in studies IV and V must be interpreted in the light of the particular RCT in which they were taking part. This means that the sample consisted only of persons who were to some extent motivated to movement-based treatment, as they had volunteered for the trial. It also means that the interviewed participants had not chosen, but been assigned to, the particular intervention that they were to narrate about. In retrospect, recruiting participants from the RCT to explore BBAT (study IV), somewhat conflicts with sampling in phenomenology, which should aim at seeking examples of experiences to enrich complexity and nuance of the phenomenon.

Generalizability in life-world-based qualitative research is viewed differently than in deductive studies, where the sample represents the whole population and the results of the sample can be transferred to the overall population (109). The methodologies used in studies II, IV and V do not make claims for the results to be definite or true for all persons with major depression but offer perspectives for understanding more about the phenomenon of study. Rather, validity is connected to the interpretative process of the analysis and the reader’s emerging understanding when reading the results. For the hermeneutic phenomenology, valid results mean that they illuminate something recognizable, which can be “sensed” by the reader and contributes to a richer view of the phenomenon of investigation. For our results, the essential features were checked with participants, with other patients with major depression who were treated at the rehabilitation clinic and with other health care professionals.

Study III

The small sample size was an obvious methodological issue. The premature ending of recruitment had to do with a slower pace of enrolment than expected (not primarily due to a lack of potential participants, but to the many excluded persons in the screening or diagnostic phases) and with upcoming organizational changes at the rehabilitation center where the interventions took place. An important limitation was the participants' higher motivation to PT-guided exercise. This was somewhat notable already during recruitment, when potential participants called in to ask more about the study. The randomization procedure made this even clearer, with content or happy expressions and comments among the participants randomized to the exercise arm, in contrast to more neutral or even disappointed reactions for the other two arms. It is possible that the layout of the advertisement, mentioning all three arms, but announcing the exercise arm first, had an influence on motivation or skewed the sample. Although the higher motivation for PT-guided exercise is a methodological bias in this RCT, it provided knowledge about the expectations of the population in terms of movement-based treatments.

Another concern was the issue of creating a suitable control condition. Our initial idea was to use a treatment-as-usual control, that is, that the participants in the control group would stay on their antidepressants but with no other changes until follow-up. This would represent an evidence-based first-line treatment strategy in primary care. However, on the basis of our clinical and research experience, we saw a risk in such a design, anticipating a higher drop-out rate in the control group due to disappointment in not receiving anything additional from the study. Had this been a naturalistic study, for example at a psychiatric clinic, where the participants would attend in order to meet a psychiatrist regardless of the study, this might have been less hazardous. In this case, however, we decided to add an advice session to the control, a minimal intervention resembling general advice on physical activity that is often provided at primary health care centers. This also facilitated a better blinding of the study's hypothesis, revealing only to the participants that three different approaches to physical activity would be compared. In carrying out the study, we acknowledged that, as the advice session was led by a physical therapist used to tailoring flexible interventions, it was difficult to provide totally generic advice in a "non-person-centered" manner. It is likely that these encounters initiated some motivation and made the participants feel seen in a way that might have influenced their depression positively. This can be viewed as a methodological limitation

but simultaneously supports the strong impact of beliefs and therapeutic alliance in treatments for major depression (115)

Moreover, the self-assessment used to measure body awareness was not optimal. It was chosen for two reasons. First, the common Swedish scale for evaluating body awareness (116) assesses movement quality from observations. Here, the idea was to search for a self-assessment to focus on the subjective sensations and experiences, more in line with the definition of body awareness by Mehling et al. (117). We were cautious about using time-consuming assessments for ethical reasons, since persons with MD tend to be easily fatigued. This was particularly an issue since the baseline assessments were preceded by a 45 minutes diagnostic interview. Second, the SBC was recommended in a review as a valid instrument to capture the complex construct of body awareness (118). In retrospect, the choice of assessment was questionable for several reasons. The back-translation into Swedish was not validated. Neither had the scale been validated in a depressed population, although contact with the research group developing the scale communicated that depression had been a common co-morbidity in the sample of persons with traumatic abuse experiences used in the scale's evaluation of content validity. Taken together, these limitations might account for the lack of effect of body awareness that would be expected in the BBAT arm. There is a need for a Swedish self-assessment scale to evaluate body awareness, practical for use in a primary care context. New or modified assessments are under development, which would be eligible for future interventions studies (68, 119-121). Another aspect worthy of investigation would have been to evaluate the level of daily physical activity across groups, for example using the International Physical Activity Questionnaire (122). Questions similar to this questionnaire were distributed in a six-month follow-up of self-assessments, not yet analyzed.

Strengths of study III were the thorough recruitment procedure, using both telephone and face-to-face interviews, structured diagnostic assessment conducted by a trainee in psychiatry and blinded evaluation of the primary outcome. Moreover, active conditions were similar in terms of frequency, duration and localities. The physical therapists involved in the interventions had vast experience of treating persons with depression, of the interventions and of a person-centered approach to PT.

Methodological discussion of the thesis as a whole

Overall, this thesis addressed the research subject from several methodological perspectives and procedures, involving deductive designs with a meta-analysis and grading of quality of evidence (study I) an RCT (study III) and qualitative methods (studies II, IV and V), including a phenomenological perspective (II, IV). This broad approach generated multifaceted and nuanced knowledge that can be important in the quest for knowledge about a complex illness phenomenon such as major depression. On the other hand, engaging in several different methods meant a difficult challenge, trying to move beyond a superficial understanding of the methodologies to grasp each perspective in a sufficiently comprehensive way.

The phenomenological framework was recognized as a main theoretical perspective for interpretation of the qualitative studies. In my understanding, it involves that the human, lived body also possesses objective qualities and unconscious, causality-bound processes. In this sense, the use of deductive approaches (studies I, III) is not contradictory but reflects a different dimension. Rather, the lived body precedes the measurable body in the sense that all interventions to modify aspects of health, fail to make sense unless there is, first, an embodied person relating meaningfully to the world that the intervention ultimately aims at.

Another potential perspective when directing the results toward future investigations, attempting to bridge biological and subjective dimensions of MD, is the research field of neurophenomenology. This was introduced in the 1990s by Varela (123), and is now receiving growing attention, as it aims to bridge the gap between subjective experience and its neural underpinnings in the cognitive sciences. Rather than studying human consciousness per se, this field is pragmatically oriented toward explaining how neurobiological and phenomenological features of consciousness are related (124). In future research of movement-based interventions in the treatment of MD, neurophenomenology would be a valuable approach to combine phenomenology with neuroscience. This approach would be of particular interest for physical therapists in terms of the recently argued “enactive” viewpoint of embodiment. Enaction is radical to cognitive science in the sense that it aims to map neural substrates and dynamic patterns of brain activity as complex processes cutting across brain-body-world dimensions rather than causal-explanatory events within the individual’s brain (123, 125). Enactive embodiment involves three dimensions: the regulation between neural process and body, the coupling between sensorimotor pathways

and the environment and intersubjective interaction, involving neural and emotional links to explain how we perceive affective states in others. This empathic recognition of others, expressed in emotional experiences and bodily sensations and movements such as mimics, gestures and posture, studied as the mirror-neuron system, is essential for human interaction and communication (126, 127).

Using my own clinical experiences of encountering persons with depression in PT was seen important to create a kind of “reflexive backdrop” in the interpretation of the results. Polanyi (128) concludes that since humans always know more than they can articulate, all attempts to formalize knowledge by overlooking such tacit knowledge, are counterproductive. Rather, all conscious processes, including the most advanced abstract and creative human abilities, have embodied, pre-reflective foundations. In this way, to generate knowledge about human beings, perceptive sensitivity and empathy are adequate means (128). In the qualitative studies, this was an essential part of the pre-understanding, to be able to conduct interviews and interpret data in a sensitive and reflective way. However, to also form thoughts in interpreting the results of the systematic review, related to professional support and to the impact of movement, an embodied know-how of the practice was important. Likewise, for the RCT, it influenced the design of the study and the collaboration with the physical therapists leading the interventions. For example, reflecting with the physical therapist in the BBAT group about the perceived depressed atmosphere in the room, or when a patient experienced emotional distress, would have been difficult without some intuitive knowledge and shared, empathic understanding. In a recent analysis of empathy, it can be understood as “a perceptual-imaginative feeling towards and with the other person’s experiences made possible by affective bodily schemas and being enhanced by a personal concern” (129). In this sense, empathy does not mean experiencing the *same* feeling as the other person but feeling *alongside* the feeling of the other person by imagining, through a rich and creative understanding, his or her experiences. Moreover, Svenaeus outlines empathy as the feeling component of *phronesis* (130). This Aristotelian term means tacit, “practical wisdom”, or judgment in practice, essential to PT practice (77, 90) and is invaluable for the process of clinical reasoning (131). Ultimately, the practical know-how guides us in our actions and decisions, paradoxically both overarching and rooting our ethics (100).

Discussion of results

The other day I went swimming and I heard my heart go
“bo-boom, bo-boom, bo-boom”. I am, I am, I am.

Plath, 1963 The Bell Jar

The main finding of this thesis is that adjunctive PT interventions, in particular guided aerobic exercise, but also BBAT, mediate changes in the depressed person’s self-experience and improve depressive symptoms. The understanding of physical movement as a multidimensional concept already vaguely emerged in study I, with the lack of an effect in the comparison between aerobic exercise and physical controls. The idea took clearer shape through the interviews with persons with major depression in study II and received more detail in study III, IV and V, showing effects on the depressive state and highlighting qualitative aspects such as the therapeutic alliance and experienced aliveness and capability.

Inspiring the design of study III, the results of study I suggested that add-on aerobic exercise is beneficial for major depression, but that more, rigorous studies are needed. Since the analysis of study I was conducted, another RCT has been published (48), further supporting the effect of add-on exercise compared to treatment-as-usual only. This study would be included in an update of study I, as would the RCT in this thesis (study III). It is likely that these two studies, which both present clinically relevant changes, would strengthen the findings of study I toward a moderate effect. Adding approximately 100 patients to the meta-analysis might also result in smaller statistical variance and, consequently, improve the domain called imprecision in the GRADE approach (107). As quality of evidence in study I was downgraded due to imprecision and methodological flaws in the studies included, the grading in an updated review would potentially increase. In addition, two recent studies have been published that would be eligible for the comparison exercise versus a “physical” control, comparing aerobic exercise to light movements including stretching and relaxation (53, 132). These studies show no differences between experimental and control groups regarding depression severity, supporting the discussion of study I that aerobic exercise does not seem to be superior to other modalities that involve move-

ment. Two ongoing studies, published as protocols, are currently investigating exercise compared to behavioral activation (133) and aerobic exercise (running or Nordic walking) compared to treatment-as-usual (134). A large Swedish study yet to be published, found that the antidepressant effects of exercise were equal to those of internet-delivered cognitive behavioral therapy, both slightly more effective than treatment-as-usual (135). Similar to the results of study I, high intensity aerobic exercise was not more effective than other types of structured exercise. Moreover, the authors discuss the need for skilled, therapeutic support to enhance motivation and adherence in the patients. However, while they suggest counseling such as physical activity on prescription (135), our results (study III, IV, V) indicate that a maintained, collaborative guidance is important. Likely, the need for guidance differs between persons and during different phases.

The effect of guided aerobic exercise in study III regarding depressive symptomatology, such as loss of interest, depressed mood and zest for life, can be related to the embodied experience of depression as confined, numb and heavy in study II. Adding the results of study IV (the perceived enhanced openness) and V (the aliveness and sense of being a capable “someone” again), these experiences can be viewed as counteracting the depressed experience of fading expressed by the participants in study II. Instead, the interventions seem to have enabled processes in the direction of “sensing life” and “seeking belongingness”, as was described in study II. Drawing on the results and discussions of studies IV and V, a slightly different rationale for a future RCT is acknowledged, taking a vantage point from an extended understanding of movement and of the relational aspects of PT interventions.

The correlation found between change in MADRS score and cardiovascular fitness is another finding that potentially reflects how the antidepressant effect of aerobic exercise can be explained. The association is supported by epidemiological and intervention studies (136-139), but the underlying mechanisms are unclear. Recently, responses in neurobiological mediators such as brain-derived neurotrophic factors and hippocampal volume were not associated with the effect of exercise for MD, although cardiovascular fitness increased (140). The role of peripheral activity in skeletal muscles is highlighted (141), proposing that an enzyme in the muscles connects to neural pathways of relevance for depression, and that this enzyme is altered by aerobic exercise. Extended to clinical research, these findings might shed further light on exercise in MD.

The lack of a statistically significant effect on the functional outcome GAF can be explained by the fact that this scale measures change that relates to improvements such as ability to work and to develop and sustain social relations. It is likely that these changes take longer than the ten-week intervention.

For several reasons, which were brought up in the methodological discussion, the design of study III was not optimal for evaluating BBAT. It has been suggested that randomized controlled trials are not well suited to examining treatments with a holistic approach (142). The procedure in itself, randomly assigning the participant to treatment, conflicts with the core of BBAT, person-centeredness and PT practice. It is possible that different results would have been obtained with a design evaluating BBAT as the only active intervention, compared to a control group, in line with a previous study in psychiatry (41, 42). Assessing motivation to the treatment arms and to the therapeutic alliance in a more standardized way would have been useful, similar to a recent study comparing different forms of online psychotherapy (143). This would also have provided an additional variable to investigate as a mediator of effects.

The control group in study III, which received advice on physical activity, showed a poorer outcome than the two more active conditions. It has recently been proposed that exercise prescriptions for depression meet little adherence (132). In line with this, an influential, large study of an intervention aiming to facilitate physical activity (based on motivational support and counseling) had no effect on depression outcomes compared to treatment as usual. It is notable that this study did not provide guided, collaborative exercise programs. The physical therapists' guidance of exercise, using individually tailored programs, was highlighted in a study concluding meaningful clinical responses to both wake therapy and exercise, but favoring wake therapy (144). The emphasis on encouraging supervision, group format and creating a regular structure with guided exercise sessions has been discussed in other, recent studies (132, 145). In support of our findings of study III, the therapeutic approach embedded in the exercise intervention seems important. To be effective, exercise for depression cannot be viewed as a decontextualized, standardized routine, but rather as a means to affect a person's sensory, motor and emotional processes, fuelled by the guidance of the physical therapist.

Lived movement as motion, emotion and commotion

Based on the main results of this thesis, movement seems to contribute to improvements in major depression by enhancing perception, agency and dialogue.

Movement is here interpreted as a means to spark an existential (physical-emotional-social) movement, for most participants in a positive way – expressed in participants’ metaphors such as “crawling out of the cocoon” (study V) or “punching holes in my armor” (study IV) - indicating a lifted mood and gained access to sensations, emotions and actions. A recent finding that support these results from a neurobiological perspective is that sensory perception is altered in major depression and that this dysfunction might mediate depression’s core symptom of reduced interest and pleasure (anhedonia) (146). For some participants, however, the inner movement included turmoil and distress. In this way, etymologically and experientially, motion relates to emotion, but also to commotion. Here, I have used the phenomenological framework to understand the participants’ experiences, interpreted as *transforming* experiences of their lived bodies, “shaking things up” in depression’s stagnation. With the experiences of enhanced perceptual and emotional access and ability to act, the lived body is extending its intentionality and attunement to the person’s life-world. This is in line with the alleviated depressive symptoms measured by the MADRS in study III, with items connecting to vitality, emotions and the feeling of commitment and involvement.

To better understand the distress expressed in study IV and possibly explaining the lesser improvement in the BBAT group in study III, the concept of *unhomelike-ness* as analyzed by Svenaeus (147) can be useful. He claims that, in depression, the intensified feelings are those that further separate the person from a sense of being “at home” with oneself, with one’s body and with the world, such as despair, boredom and guilt. These feelings, in relation to depression, also share the fact that they are not directed toward an object but rather color the person’s whole existence, as a sort of existential, background feeling (148). Possibly, mindful movement, by consciously seeking connection with one’s genuine self, challenges the sense of homelike being, which can cause distress in persons with strong estrangement and distrust of their bodies. This interpretation makes sense of the diverse experiences in study IV, where most participants felt more rooted, vital and acknowledged following BBAT, while some experienced anxiety and strong discomfort. Supporting our findings, studies of mindfulness meditation have found to prevent relapse of MD in remitted patients (149) - who assumingly have regained a more homelike experience of themselves - rather than effects on the acute depressive state.

According to our findings, essential characteristics in the PT process for persons with MD are to reconnect to a sense of aliveness and capability. This is to come

alive and to be someone again, as one participant expresses in study V, “I’m coming back to myself, taking it back so to speak!”, and not just to return to oneself as an isolated individual, but through relations with other persons, such as the physical therapist or the group members, as exemplified by another participant in study V: “...you come here and you become someone who is *cared about by someone else*, and that feels pretty great” (my italics). The process involves great strain and effort that, for most participants, call for empathic, present support from the physical therapist.

Person-centeredness in physical therapy: embodied dialogue and co-carrying hope

This thesis proposes that the relational and structural context of exercise - the *how* to create and take part in exercise - is essential for effects on major depression. This idea was briefly reflected upon when systematically reviewing other RCTs in study I, and grew stronger by the qualitative data relating to the balance of the patient-professional relationship in study II, and by the significant effect of exercise using a person-centered approach in study III. The qualitative studies IV and V added to these findings by illuminating relational and communicative aspects, such as “being seen”, “someone awaiting me” and “the physical therapist reads between the lines”.

The social understanding between persons, such as in the PT-patient relationship, can be understood as a dynamic process of participatory sense-making and mutual incorporation (126). This means entering a process of embodied interaction, through which a shared meaning is generated. In this way, clinical reasoning reaches beyond a thinking process in the head of the physical therapist (131, 150). In line with the body as both subject and object (86), the PT needs to make use of not only the third person perspective of the patient’s organic body but also the first person perspective of the PT’s own body and, recently argued, a second person perspective formed in embodied interaction with the patient (150). The communication involves not only words and gestures but is also a physical dialogue that consists of the physical therapist’s touch, mirroring and attunement, and the patient’s responses. Consistent with findings from infant studies, research on the attachment in adult psychotherapy conclude that the therapist’s non-verbal attunement relates strongly to the patient’s trust in the therapist and predicts treatment outcome (151).

Attuning to and entering the world of the patient call for creativity, imagination, empathy and responsiveness in the physical therapist. This relates to seeing part

of oneself in the patient, “oneself as another” to quote Ricouer. Simultaneously, to endure the patient’s suffering, maintain hope and inspire to change; the physical therapist needs to distinguish her or himself as *other*. This delicate, embodied dialogue would benefit from further exploration in PT.

Related to person-centredness, Mudge et al. (83) describe a frustration connected to the physical therapist’s fear of fostering false hope. The authors emphasize that hope, in itself, built and maintained through interaction, is an overlooked contributor to improved wellbeing. They claim that goals can be seen as aspirations rather than something that necessarily needs to be fulfilled. In this sense, I suggest that the physical therapist takes on the role of a vicarious carrier, a *co-carrier*, of hope. I will try to exemplify. One of my patients in clinical practice explained that he needed the scheduled appointments because he would never have done it just for himself when he felt depressed. He added: “I don’t mean this in a harsh sense, but I go for your sake. If I don’t go, I let you down, and by doing that I’m also letting myself down.” Here, I propose that the physical therapist needs to be aware of, and accept that, for some time, he or she will co-carry the hope and motivation for change, with the patient. In the same line, Knapen et al. (141) suggest that the physical therapist needs to communicate empathic validation and encouragement to support the patient’s struggling with ambivalence. They suggest that maintaining focus on short-time or even immediate benefits such as a sense of energy, relaxation or improved sleep can help the patient in this process.

PT needs to, more consciously, make sense of the more humanistic aspects of its heritage and, parallel to the technical skills of the “doing”, embrace a receptive “being with” the patient. This includes mindful listening, warmth and emotional support and fostering of hope, which have also been shown to mediate the effects of PT interventions (152, 153). Person-centeredness in this sense means a continuum of adaptable interaction styles that will differ between patients and also change during each treatment process, calling for flexibility and responsiveness in the therapist (83). To grasp what is really important to the person, to see the person in his or her own life, technical expertise is important but not enough – it must be augmented with human connectedness. The systematics of practicing person-centered PT depend on the therapist’s process of refinement and awareness, embracing both technical knowledge and tacit know-how, and a continuous reflection of the complexity of human interaction in clinical practice.

Implications for practice

The results of this thesis can be useful for health care's future challenge to reduce the burden of depressive disorders. In particular, as the results should be interpreted in the context of the studies conducted, they provide examples to expand the range of available treatments in primary care. Considering that the public attitude to and effects of antidepressant medication are varied (154-157), greater knowledge of the non-pharmacological strategies in this thesis is important to broaden the range of evidence-based treatments. Moreover, the theoretical frame highlights the recent research interest in relating philosophy to the neuroscience and psychopathology of MD, proposing a future integration of empirically informed findings on sensory motor issues and embodied interaction (158). This theoretical field can be of importance to physical therapy as well.

As MD often concurs with, for example, cardiovascular disease and musculoskeletal pain, it is likely that many present and future patients seeking PT suffer from MD, treated or untreated. This thesis shows, from the participants' experiences and the effects of interventions, that the patient's body experiences, expectations and motivation to treatment and need for therapeutic guidance need to be considered. The results show that PT has the potential to play a more important role in the treatment of MD and highlight that physical therapists need to be sensitive to how depression is experienced and expressed from the perspective of body and movement, and what depression means to the persons who live it. This does not necessarily mean fostering a strong emphasis on identifying or classifying MD in PT. The point here is rather to increase awareness among physical therapists and to enhance knowledge of the human possibilities to reconnect to experiences of capability, aliveness and fundamental openness to sense, act and relate, that come with the movement perspective. In fact, one of the benefits of the PT perspective is the advantage of not having to narrow in on the actual diagnosis, but to holistically address the embodied, relating person.

More specifically, the results can inspire implementing an intervention in primary care rehabilitation, focusing on guided exercise initiated and designed by attuning to and collaborating with the patient as a person. This collaboration needs to include a joint planning on how and what type of movement could engage the person in question, which also includes a receptiveness to the "being" to balance the "doing" in PT practice. This intervention needs to be easily accessed, offering a short time between initial contact and start of treatment, in line with experiences during the recruitment for study III. When a "window" of possibility and motivation opens for the person suffering from depression,

health care needs to respond. Further, the intervention is preferably to be based on scheduled appointments with the physical therapist, at least initially, for the patient to feel seen and sufficiently supported. There is reason to target such an intervention to younger adults considering the increase of mental illness and sick leave due to depressive and anxiety disorders among the young in Sweden (26).

The person-centered perspective also needs to be reflected upon and evaluated in relation to organizational frames and today's call for quick, highly productive and streamlined care processes. Most recently, various production-based models have been endorsed in Swedish primary health care and rehabilitation, which might be challenging to a person-centered approach in some respects. It is likely that person-centered rehabilitation does not necessarily mean more time-consuming treatment sessions. To the contrary, experiences from this thesis suggest that valuable, therapeutic changes in the collaborative partnership emerge as momentary glimpses, sometimes from very short encounters. Shifting the focus from "must do's" such as standard regimes of assessments and treatments (which can still be useful as a tool box in the professional backpack) to taking in the person seeking help as the starting point, might in fact be time-saving. However, a problem lies in that increasing numbers of encounters with different persons in high productive care will gradually drain energy from physical therapists. Genuine relating is rewarding, but can also be energy-draining if too little space is left for reflection, professional development and collegial discussions. This is a concern that needs to be addressed from an organizational perspective.

CONCLUSION

Taken together, the results of the work carried out in this thesis suggest that add-on treatment with exercise and basic body awareness therapy conducted in a PT context has a positive impact on depressive symptoms and self-experience in persons with major depression. In particular, a ten-week period of aerobic exercise using a person-centered approach had a statistically significant effect on depression severity and cardiovascular fitness. Qualitative studies suggest that the participants' experiences of the physical therapy treatments are connected to an enhanced sense of openness, capability and aliveness. Moreover, their experiences emphasize the importance of features connected to the person-centered approach. This involves feeling acknowledged in a trustful and embodied dialogue with the physical therapist as a precondition for supportive collaboration, flexible enough to balance between vulnerability and agency.

The results propose that PT has the potential to take on a more important role in the treatment of major depression, although more and larger studies are needed. Future research might continue to explore the phenomenological framework underpinning this thesis, in combination with modern techniques in neuroscience, to further understand physical therapy interventions and the concept of movement in relation to major depression.

FUTURE PERSPECTIVES

Future implementation of a PT intervention such as described above needs evaluation as regards short and long-term effects. Here, a more pragmatic, naturalistic design might be more in line with daily clinical practice.

To further expand the understanding of the concept of movement, beyond the bio-psycho-social view, combined biological and phenomenological investigations should be highly valuable. Movement-based interventions related to enactive and intersubjective dimensions of embodiment (158-160) will need different methodological approaches for future progress, since: “indeed, neuroscience has turned social” (160). For example, modern techniques such as neuroimaging or biomarkers would add to this thesis’ more narrative form of data, capturing changes in the organic body connected to subjective experiences of movement. This calls for innovative research collaborations across professional boundaries and theories of science.

Basic body awareness therapy needs to be studied using a different design, either as the only intervention versus a control group or as part of a flexible intervention that could include elements of both exercise and BBAT. Similarly, a mixture of aerobic and mindful exercises is proposed for investigation of physiological mechanisms underlying stress (161). The content of a future intervention would preferably be designed in a collaboration between patient and physical therapist, expanding the person-centeredness in the RCT of this thesis, and resemble the everyday practice of primary care physical therapists. Connected to the evaluation of BBAT, future development of a self-assessment scale to measure body awareness, validated in a Swedish population, is warranted.

Moreover, although this thesis proposes additional ideas to the concept of person-centeredness in PT, these ideas need further investigation. For example, studying the interaction in treatment as a result of education and systematic reflection on person-centered rehabilitation would provide deeper insight into how the approach can be refined in practice. In particular, study designs that facilitate embodied communication in the data, such as video recordings or observation studies, would be useful in this respect. Further, the associations between person-centered features and health effects need examining.

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