Region Västra Götaland, HTA-centrum
Regional activity-based HTA [Verksamhetsbaserad HTA]
Health Technology Assessment
HTA report 2016:90

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VÄSTRA GÖTALANDSREGIONEN
SAHLGRENSKA UNIVERSITETSSJUKHUSET

Nature-based rehabilitation for patients with longstanding stress-related disorders [Grön rehabilitering för patienter med långvarig stressrelaterad ohälsa]

Bernhardsson S[1*], Aevarsson O[2], Björkander E[3], Blomberg A[4], Ellsén M[5], Ericsson A[1], Larsson E-L[6], Persson J[7], Samuelsson O[7], Spalde G[8], Svanberg T[3], Jivegård L[7]

[1]Närhälsan FoU primary care, Region Västra Götaland, Sweden
[2]Institute for Stress Medicine, Göteborg, Sweden
[3]Medical Library, Sahlgrenska University Hospital, Göteborg, Sweden
[4]Sahlgrenska Academy, Programme in Public Health Science, University of Gothenburg, Göteborg, Sweden
[5]Grön Rehab Nordost, Närhälsan, Göteborg, Sweden
[6]Gröna Rehab, Gothenburg Botanical Garden, Göteborg, Sweden
[7]The Regional Health Technology Assessment Centre of Region Västra Götaland, Göteborg, Sweden
[8]Grön Rehab Väster, Närhälsan, Göteborg, Sweden

[*]Corresponding author

Published June 2016
2016:90
Suggested citation: Bernhardsson S, Aevarsson O, Björkander E, Blomberg A, Ellsén M, Ericsson A, Larsson E-L, Persson J, Samuelsson O, Spalde G, Svanberg T, Jivegård L. Nature-based rehabilitation for patients with longstanding stress-related disorders [Grön rehabilitering för patienter med långvarig stressrelaterad ohälsa]Göteborg: Västra Götalandsregionen, Sahlgrenska Universitetssjukhuset, HTA-centrum; 2016. Regional activity-based HTA 2016:90

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1. Abstract

Background

Mental health problems are major contributors to work disability and stress-related illness comprises a large proportion. Stress-related illness includes the diagnosis “Exhaustion disorder” (ED) which defines exhaustion as a consequence of identifiable stressor(s) present for at least six months and ED was accepted as a separate diagnosis in Sweden in 2005. Symptoms include exhaustion, cognitive dysfunction, sleep disturbance, reduced tolerance to further stress and somatic symptoms. A prevalence of ED of 5–22% has been estimated in Swedish working populations. Most patients with ED receive treatment within primary and occupational health care. Some patients with severe ED and comorbidity with anxiety and depression are offered contact with specialist psychiatry and receive specialised psychological treatments, occupational therapy, physiotherapy and psycho-education by multidisciplinary teams, so called Multimodal rehabilitation.
Nature-Based Rehabilitation (NBR, “Grön Rehab”), originally developed at the Swedish University of Agricultural Sciences, is led by a multidisciplinary rehabilitation team, usually including a physiotherapist, an occupational therapist, a psychotherapist/psychologist and personnel with competences related to garden and nature. The intervention takes place in a selected garden or natural environment. Internal evaluations from NBR programmes have shown promising results.

Objective

To study the effectiveness of multidisciplinary, group-based nature-based rehabilitation (NBR) compared with either multidisciplinary, group-based, rehabilitation that is not nature-based, or any other rehabilitation that is not nature-based, for patients with longstanding (>6 months) stress-related disorders in terms of stress symptoms, health-related quality of life (HRQoL), work ability, sick leave, and healthcare consumption.

Methods

During December 2015, systematic literature searches were conducted in PubMed, Embase, the Cochrane Library, Cinahl, Amed, PsycInfo and a number of HTA databases. At least two authors independently screened titles, abstracts, full-text articles for inclusion and thereafter appraised study quality and extracted data. The certainty of evidence was appraised according to GRADE.

Main results

Six articles (one RCT, two controlled cohort studies and three qualitative studies) were finally included in the report. All quantitative studies had major study limitations. No studies reported the outcomes HRQoL, depression, anxiety, fatigue, cognitive disability and pain. Regarding the outcomes sick leave, self-assessed work ability, healthcare consumption and perceived stress it is uncertain whether there are any differences between results of NBR compared with other forms of rehabilitation (GRADE ⊕◯◯◯).
The quality of the three qualitative studies was assessed as moderate. The qualitative studies showed that participants in NBR experience positive health effects from being in natural environments and working in a garden. Participants in one NBR programme expressed that they had received tools and strategies to better manage stress, and that garden and nature played an important role in stress relief.

Conclusion

The effectiveness of NBR compared with other forms of rehabilitation in patients with longstanding stress-related disorders is poorly studied. Based on three available quantitative studies, it is uncertain whether there are any differences between the results of NBR and those of other rehabilitation programmes. Qualitative studies suggest positive health effects from being in natural environments and working in a garden. More studies are needed.

2. Svensk sammanfattning – Swedish summary

Bakgrund

Psykiska sjukdomar är en vanlig orsak till arbetsoförmåga och stressrelaterad sjukdom utgör en stor andel av dessa. Utmattningssyndrom (Exhaustion Disorder, ED) innefattar patienter med psykisk utmattning som en konsekvens av identifierbara stressfaktorer som förelegat under minst sex månader. Utmattningssyndrom (ED) accepterades som en separat diagnos i Sverige 2005. Symtomen inkluderar utmattning, kognitiv dysfunktion, sömnstörningar, reducerad stresstålighet och somatiska symtom. Prevalensen av ED har uppskattats till 5–22 % bland anställda personer i Sverige. De flesta patienter med ED behandlas inom primär- eller företagshälsovården. En del patienter med ED och komorbiditet i form av ångest och depression får kontakt med psykiatrisk vård och erhåller speciell psykologisk terapi, arbetsterapi, fysioterapi och undervisning i psykosocial hälsa av multidisciplinära team, så kallad multimodal rehabilitering. Naturbaserad rehabilitering (NBR, "Grön Rehab") utvecklades ursprungligen på Sveriges lantbruksuniversitet och leds alltid av ett multidisciplinärt rehabiliteringsteam som i regel inkluderar en fysioterapeut, en arbetsterapeut, en psykoterapeut/psykolog och individer med kompetens relaterat till trädgård och natur. Behandlingen genomförs i en utvald trädgård eller natur. Interna utvärderingar har visat lovande resultat.

Syfte

Att utvärdera resultaten (symtom relaterade till ED, hälsorelaterad livskvalitet, sjukskrivning, arbetsförmåga och vårdkonsumtion) av Grön Rehab jämfört med multidisciplinär gruppbaserad rehabilitering som ej är naturbaserad eller annan icke naturbaserad rehabilitering hos patienter med långvariga (> 6 mån) stressrelaterade besvär som leder till arbetsoförmåga.

Metoder

Under december 2015 gjordes systematiska litteratursökningar i PubMed, Embase, the Cochrane Library, Cinahl, Amed, PsycInfo och flera HTA-databaser. Två eller fler författare granskade titlar, abstracts och fulltextartiklar, värderade studiekvalitet och extraherade data oberoende av varandra. Evidensgraden definierades enligt GRADE-systemet.

Resultat

Sex artiklar (tre kvantitativa studier: en randomiserad kontrollerad studie och två kohortstudier med kontroller samt tre kvalitativa studier) uppfyllde inklusionskriterierna. De kvantitativa studierna hade allvarliga begränsningar vad gäller studiekvalitet. Inga kvantitativa studier redovisade utfallen hälsorelaterad livskvalitet, depression, ångest, utmattning, kognitiva störningar och smärta. Vad gäller utfallen sjukskrivning, självskattad arbetsförmåga, sjukvårdskonsumtion och upplevd stress fanns begränsade data och slutsatsen blev att det är osäkert huruvida det föreligger någon skillnad mellan resultaten av Grön Rehab jämfört med andra former av rehabilitering (GRADE ⊕○○○). De kvalitativa studiernas studiekvalitet bedömdes som måttlig. De kvalitativa studierna visade att deltagare i Grön Rehab-program upplevde positiva hälsoeffekter av vistelse i natur och trädgårdsarbete. Deltagare i ett av programmen uttryckte att de hade fått verktyg och strategier som hjälpte dem att bättre hantera stress och att trädgård och natur spelade en viktig roll för att motverka stress.

Sammanfattande slutsats

Det föreligger en mycket begränsad dokumentation av resultaten av Grön Rehab jämfört med annan rehabilitering hos patienter med långvarig stressrelaterad ohälsa. Slutsatsen av tre kvantitativa studier är att det är osäkert huruvida det föreligger några skillnader i resultaten av Grön Rehab jämfört med andra rehabiliteringsprogram. Resultaten av tre kvalitativa studier antyder positiva hälsoeffekter av vistelse i natur och trädgård. Det behövs fler studier där resultaten av Grön Rehab jämförs med resultaten av annan rehabilitering.

The above summaries were written by representatives from the HTA-centrum. The HTA-report was approved by the Regional board for quality assurance of activity-based HTA. The abstract is a concise summary of the results of the systematic review. The Swedish summary is a brief summary of the systematic review intended for decision makers, and is ended with a concluding remark.

Christina Bergh, Professor, MD
Head of HTA-centrum of Region Västra Götaland, Sweden, 2016-05-25

Christina Bergh	Anders Larsson	Henrik Sjövall
MD, Professor	MD, PhD	MD, Professor
Elisabeth Hansson-Olofsson	Olle Nelzén	Petteri Sjögren
PhD, Senior lecturer	MD, Associate professor	DDS, PhD
Magnus Hakeberg	Christian Rylander	Maria Skogby
OD, Professor	MD, PhD	RN, PhD
Lennart Jivegård	Ola Samuelsson	Annika Strandell
MD, Senior university lecturer	MD, Associate professor	MD, Associate professor
Jenny Kindblom	Ninni Sernert	Therese Svanberg
MD, Associate professor	Associate professor	HTA librarian

3. Summary of Findings (SoF table)

Outcomes	Study design Number of studies	Relative effect (95% CI)	Absolute effect	Certainty of evidence GRADE
Sick leave	One RCT One cohort study		Intergroup difference at 20 months Δ 2 days (95% CI -2 to 5) ns Proportion with sickness benefit at 20 months Intergroup difference Δ 15% ns	⊕◯◯◯ Very low[1] ⊕◯◯◯ Very low[2]
Self-assessed work ability	One cohort study		Work ability index[3] (0–10) Intergroup difference 0–3 months Δ 0.70 (95% CI -0.43 to 1.84) ns 3–6 months Δ 0.46 (CI -0.86 to 1.78) ns	⊕◯◯◯ Very low[4]
Healthcare consumption	One cohort study		One year after/one year before (SMR[5]) Number of outpatient visits: NBR 0.84 (95% CI 0.81-0.87) Control 0.92 (95% CI 0.90-0.93) Intergroup difference p< 0.05 Hospital stay[7] (days): NBR 0.47 (95% CI 0.43-0.52) Control 0.94 (95% CI 0.87-1.0) Intergroup difference p< 0.05	⊕◯◯◯ Very low[6]
Perceived stress	One cohort study		PSS-10[8], change from baseline at 3 months NBR -4.61 (95% CI -6.52 to -2.71) Control -4.16 (95% CI -6.59 to -1.73) Intergroup difference Δ 0.09 (-0.36 to 0.53) ns	⊕◯◯◯ Very low[9]

Footnotes:
[1] Downgraded for indirectness, unclear randomization procedure, unclear reasons for dropout, no blinding
[2] Downgraded for baseline differences, poorly reported confounders, compliance and numbers and reasons for dropout
[3] 10 denotes the best work ability
[4] Downgraded for risk of selection bias and high dropout rate
[5] Standard morbidity ratio
[6] Downgraded for baseline differences, poorly reported confounders, compliance and size and reasons for dropout
[7] Absolute values for hospital stay in both study groups is not reported
[8] Perceived Stress Scale, 0–40, higher scores indicate more frequent symptoms
[9] Downgraded for risk of selection bias and high dropout rate

Certainty of evidence

High certainty ⊕⊕⊕⊕	We are very confident that the true effect lies close to that of the estimate of the effect.
Moderate certainty ⊕⊕⊕◯	We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low certainty ⊕⊕◯◯	Confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect.
Very low certainty ⊕◯◯◯	We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect

4. Abbreviations

APA = American psychological association
ED = Exhaustion disorder
MMR1 = Multimodal rehabilitation, level 1*
MMR2 = Multimodal rehabilitation, level 2*
NAT = Nature-assisted therapy
NBR = Nature-based rehabilitation
NICE = National Institute for health and Clinical Excellence
OHS = Occupational health care service
PSS = Perceived Stress Scale
RCT = Randomised controlled trial
SMR = Standard morbidity ratio
VGR = Region Västra Götaland
WAI = Work Ability Index
WHO= World Health Organization

*MMR1 and MMR2 are further defined on page 19.

5. Background

Stress-related disorders

Mental health problems are estimated to be one of the major global contributors to work disabilities (Salomon *et al*, 2012; Vos *et al*, 2012). In Sweden, the prevalence of sick leave caused by mental health problems increased around the turn of the millennium (Henderson *et al*, 2005; Stefansson *et al*, 2006) and according to a Swedish Social Insurance Agency report, the most common cause of sick leave from work is stress-related illness (Försäkringskassan 2013). After having risen dramatically between 1997 and 2003, the trend was reversed and sick leave due to mental illness was reduced (Åsberg *et al*, 2010). Since 2010 a general increase in sick leave has been observed again in Sweden, and mental illness comprises a substantial part. The proportion of mental illness diagnoses of all sick leave has increased from 17% in 2006 to 25% in 2015 (Försäkringskassan 2015).

Stress-related illness comprises a large proportion of mental illness. According to WHO's International Classification of Diseases, ICD-10 (ICD-10-SE 2016), stress-related illness is classified into the following diagnoses:

- Acute stress reaction (F43.0)
- Posttraumatic stress disorder (PTSD) (F43.1)
- Adjustment disorder (F43.2)
- Other reactions to severe stress (F43.8)
- Exhaustion disorder (Utmattningssyndrom) (F43.8A)

In this cluster the clinical diagnosis "*Exhaustion disorder*" (ED) was proposed by the National Board of Health and Welfare in Sweden for use in clinical practice to define patients with exhaustion that has developed as a consequence of identifiable stressor(s) that have been present for at least six months. ED was accepted as a separate diagnosis (F43.8A), in Sweden in 2005 but the term is not commonly used in other countries (Swedish National Board of Health and Welfare, 2003), where the diagnoses adjustment disorder, other reactions to severe stress, depression and anxiety are more commonly used for such conditions. The diagnoses *Acute stress reaction* and *Post-traumatic stress disorder* (*PTSD)* are used when a person has been exposed to a specific traumatic event that includes death/death threat or serious violence, or being a witness to such a situation. Examples of symptoms are flash-backs and avoidance of what is related to the trauma. The difference between these two diagnoses is the duration of symptoms; *Acute stress reaction* refers to an immediate reaction after exposure whereas *PTSD* has a longer duration of symptoms (more than one month). *Adjustment disorder* is used as a diagnosis when emotional and behavioural changes are seen as a consequence to identifiable stressors, but at a maximum of six months after the stressor/s occurred (whereas ED has the criteria at least six months of duration). *Other reactions to severe stress* is used as a diagnosis when the criteria are not met for any of the other stress-related diagnoses, but the symptoms still cause significant suffering and loss of functions (American Psychiatric Association, DSM-5, 2013).

The diagnostic criteria of ED include the following main symptoms: exhaustion, cognitive dysfunction, sleep disturbance, reduced tolerance to further stress, and somatic symptoms (Swedish National Board of Health and Welfare, 2003). The complete diagnostic criteria are presented in Appendix 5. Lack of energy and cognitive problems often become long-lasting (Jonsdottir *et al*, 2013). The severity of ED symptoms ranges from mild to severe reduction in functioning, which may entail a risk of reduced quality of life and disability, as well as reduced work ability and activities in daily living for several months or even years (Palsdottir *et al*, 2014A).

Prevalence of stress-related disorders

Estimates of prevalence of ED in Swedish working populations range between five and 22% (Norlund *et al*, 2010; Hallsten *et al*, 2002; Lindblom *et al*, 2006). No prevalence estimates of other stress-related disorders have been found.

Present treatment of stress-related disorders

After assessment and diagnosis, most patients with stress-related disorders receive general treatment, comprising a combination of psychological support, physical activity, guidance and medication as needed for symptoms of depression and anxiety. According to current regional medical guidelines from Region Västra Götaland (VGR), patients with mild ED should be managed within primary care and occupational health care (Region Västra Götaland 2014). Stakeholders such as the Social Insurance Agency, employers and the occupational health care service (OHS) are involved in the process of return-to-work activities. Some patients with severe ED and comorbidity with anxiety and depression are offered contact with specialist psychiatry when needed. They often receive specialised psychological treatments, occupational therapy, physiotherapy and psycho-education. This type of treatment and rehabilitation is typically provided by multidisciplinary teams within the approach of so-called Multimodal rehabilitation.

The normal pathway through the healthcare system and current wait time for medical assessment /treatment

Patients who perceive symptoms related to stress normally seek care at primary health care or OHS centres. Some primary care centres have a triage system in place where the patient is directed to physiotherapy, occupational therapy or psychological treatment directly, depending on their symptoms.

Availability of multidisciplinary teams in primary care and occupational health care within VGR varies. Some units offer stress management courses that typically run over a period of 8-10 weeks. A specific form of stress management within the multidisciplinary approach is Nature-based rehabilitation (NBR), which has for many years been an important part of the rehabilitation process in VGR for patients with stress-related disorders.

At the Institute for Stress Medicine (ISM), a specialist clinic within VGR, in conjunction with stress research operating for more than a decade, an individualised multidisciplinary treatment focused on return to work was developed. Patients with the most severe symptoms are offered NBR.

According to VGR quality criteria/requirements (Krav- och Kvalitetsboken), average waiting time for a first assessment by a general practitioner should be maximum seven days. Actual waiting times for this condition have not been possible to assess. Average waiting time for a first assessment by physiotherapist or occupational therapist in Närhälsan (VGR primary care) is usually less than seven days, often as little as one day due to the current “drop in” systems in place at many rehabilitation units. Waiting times to psychologist/psychotherapist are often longer and can vary from two weeks to six months.

Number of patients per year who undergo nature-based rehabilitation

An estimated 40,000 patients annually seek primary care in VGR for long-term (defined as $\geq$ 3 visits) stress-related disorders, including ED and other diagnoses. The vast majority of these patients are treated within primary care. In 2015, approximately 135 patients with long-term stress-related disorders were treated with NBR at four units in VGR. A few other units in VGR also provide NBR, but because their activities are work-oriented and typically not provided by healthcare staff, these units are not considered in this report.

Present recommendations from medical societies or health authorities

No present national or international recommendations from medical societies or health authorities have been identified regarding the use of NBR and/or nature-assisted therapy (NAT) for individuals with stress-related mental illness. No records were found in a web-based search performed at the relevant international authorities (NICE, UK; APA, USA; WHO Guidelines).

National guidelines for stress-related depression, anxiety and exhaustion disorder state that there should be an effective caretaking with great accessibility and continuity in first line care and that the caregiver should be able to offer a combination of arrangements and measures. This requires different evidence-based treatments, comprising both first-line and second-line care, and that these two lines cooperate (National Board of Health and Welfare in Sweden 2010). An audit of the national guidelines is currently taking place and a revised version should be available at the end of 2016. A 2014 brief report from SBU on ”green rehabilitation for stress-related ill health” and its effect on return to work did not identify any relevant studies but reported that the authors of the two included systematic reviews concluded that ”green rehabilitation may have positive effect, but more studies are required” (SBU 2014).

Current regional medical guidelines from VGR for the management of ED highlight the importance of identifying the most important stressors for the patient, regardless of severity of the disease, and recommend that treatment is individualised according to the patient’s needs. Treatment includes lifestyle advice about regular life needs and activities including sleep, meals and physical activity, individual or group-based physical activity, “graded physical activity” and advice and workplace measures (Region Västra Götaland 2014). Everyday physical activity, such as housework and gardening, as well as education in stress management and relaxation skills, is particularly recommended. The guidelines also recommend that multidisciplinary interventions are offered, including physiotherapy, occupational therapy, and psychological treatment such as cognitive behavioural therapy and psychodynamic group therapy. Furthermore, the guidelines emphasise that the timing of interventions and a holistic perspective are important, and that the primary goal of interventions should be to support the patient in returning to work (Region Västra Götaland 2014).

6. Nature-based rehabilitation

Because of increasing numbers of employees on long-term sick leave due to stress-related disorders, an NBR programme was initiated and directed to the employees of VGR. Conventional rehabilitation of employees in VGR is handled by the organisation’s own occupational health service, where a team-based rehabilitation model has been developed for this patient group (Sahlin 2014, Doctoral thesis), called “Grön rehabilitering” (“Green rehabilitation”). Patients indicate benefits after treatment and clinical experience suggests that this type of rehabilitation has a favourable outcome. A positive effect of nature on stress recovery has been suggested (Ulrich *et al*, 1991, Berto *et al*, 2014).

The number of NBR programmes in Sweden for patients with stress-related mental disorders has grown quickly during the first decade of the 21st century. A lack of established rehabilitation programmes for this patient group has opened up for the establishment of NBR as an intervention for stress-related disorders. The intervention was originally developed at the Swedish University of Agricultural Sciences at Alnarp. There is no commonly accepted standardisation of NBR but it is always led by a multi-disciplinary rehabilitation team, usually including a physiotherapist, an occupational therapist, a psychotherapist/psychologist and personnel with competences related to the garden and nature. Each profession contributes to the content of the programmes on an inter-disciplinary basis. The length of an NBR programme can range from eight to 28 weeks depending

on the mission. The participants often come in groups of eight individuals. The intensity of NBR usually ranges between two and four hours per day, two to four days per week. The NBR activities include mild and limited sensory stimulation and therapeutic activities, in a specially designed garden or selected nature environment.

As NBR is neither internationally nor nationally standardised nor has a clear-cut definition, it is difficult to compare it with multi-disciplinary team rehabilitation in general. One difference is that the ordinary multi-disciplinary team lacks the "green" professions (e.g. gardener, biologist or other profession with competencies related to nature/garden). Other important differences are the presumed stress reducing effects inherent with nature and garden environments, and the use of symbolic activities/opportunities in nature. On the other hand, the programs can be similar in content regarding components such as psycho-educative talks about how to prevent stress, bodily exercises, mindfulness, and creative workshops.

Internal evaluations from NBR programmes, published as well as unpublished, have suggested promising results for individuals with long term sick leave due to stress-related mental disorders in their return-to-work rehabilitation (Sahlin & Ahlborg, 2010). Gröna Rehab Botaniska has a stated aim that the participants during the latter part of the programme should phase in work or studies and phase out the programme. All participants at Gröna Rehab Botaniska are employed in VGR and on average they have been on sick leave for 26 months (range from three months to 12 years).

In view of the increasing prevalence of stress-related mental disorders and the accompanying burden for both individual and society, it is important to find effective methods for rehabilitation and to further develop methods that seem to be promising as well as to do further research comparing NBR with other methods.

7. Objective

The focused question

Is multidisciplinary, group-based, nature-based rehabilitation (NBR) more effective than either multidisciplinary, group-based, rehabilitation that is not nature-based, or any other rehabilitation that is not nature-based, for patients with longstanding (>6 months) stress-related disorders, in terms of health-related quality of life, sick leave, work ability, healthcare consumption, perceived stress, depression, anxiety, fatigue, cognitive disability or pain?

PICO P= Patients, I= Intervention, C= Comparison, O=Outcome

P: Patients with longstanding (>6 months) stress-related disorders without ongoing drug abuse
I: Multidisciplinary, group-based, nature-based rehabilitation
C1: Rehabilitation that is multidisciplinary, group-based but not nature-based
C2: Any other rehabilitation that is not nature-based
O: Outcomes

Critical for decision making
Health-related quality of life
sick leave
work ability
healthcare consumption

Important for decision making
Perceived stress
depression
anxiety
fatigue
cognitive disability
pain

Not important for decision making
None

8. Methods

The activity-based HTA process

Systematic literature search (Appendix 1)

During December 2015 two authors (TS, EB) performed systematic searches in PubMed, Embase, the Cochrane Library, Cinahl, Amed, PsycInfo and a number of HTA databases. Reference lists of relevant articles were also scrutinised for additional references. Search strategies, eligibility criteria and a graphic presentation of the selection process are presented in Appendix 1. These authors conducted the literature searches, selected studies, and independently of one another assessed the obtained abstracts and made a first selection of full-text articles for inclusion or exclusion. Any disagreements were resolved in consensus. The remaining articles were sent to all participants in the project group. All authors read the articles independently of one another and it was finally decided in a consensus meeting which articles should be included in the assessment.

Critical appraisal and certainty of evidence

Both the quantitative and the qualitative studies included in the report were critically appraised using checklists modified from the Swedish Council on Health Technology Assessment (SBU). The certainty of evidence for the quantitative studies was appraised according to the GRADE approach (Atkins *et al*, 2004; GRADE Working group).

Ongoing research

A search in Clinicaltrials.gov (2016-04-15) using the search terms ((Stress OR exhaustion OR Stress-related OR stress-induced OR adjustment disorder* OR adaptation syndrome OR burnout OR burn-out OR pain OR anxiety OR depression OR fatigue) AND (nature-based OR nature-supported OR nature-assisted OR Gardening OR garden OR horticult*)) OR ((nature-based OR nature-supported OR nature-assisted) AND (treatment OR rehabilitation OR therapy*)) identified 316 trials. Titles/abstracts of these were screened by two authors (see Section 14 – Future perspectives).

9. Results

Literature search (Appendix 1)

The literature search identified 538 articles after removal of duplicates. After reading the abstracts 517 articles were excluded. Another seven articles were excluded by two authors (ES, TB) after reading the articles in full text. The remaining 14 articles were sent to all participants of the project group, and six articles (one RCT, two controlled cohort studies and three qualitative studies) were finally included in the report (Appendix 2). The excluded articles and reasons for exclusions are listed in Appendix 3.

Quality of the included studies

All three quantitative studies included in the analysis had major limitations, primarily related to study design. In the RCT, directness was compromised due to the mixed study population which included both stress-related disorders and other mental illness, which is not entirely consistent with the PICO in this analysis. Furthermore, randomisation, blinding, and reasons for drop-out were unclear. Study limitations in the two cohort studies included baseline differences, poorly reported confounders, compliance, numbers lost to follow up and reasons for drop-out. The quality of the three qualitative studies was assessed as moderate, with main limitations being lack of ethical considerations, unclear descriptions of recruitment processes, unclear issues related to the analyses, and uncertain transferability of findings to other contexts.

Results per outcome

Outcomes critical for decision-making

Sick leave (Appendix 4:1)

Sick leave was reported in one RCT and one cohort study. The RCT, conducted in VGR, compared NBR with a control group receiving usual care in patients with mainly ED. The cohort study compared NBR with controls matched for main condition, age and sex, recruited from the Skåne Health Care register, who had received usual care. The primary outcome was any kind of sickness benefit or compensation. Thus, it includes sick leave. Both the RCT and the cohort study had major limitations. The RCT reported no significant intergroup difference in sick leave after 20 months. Also the cohort study reported no significant intergroup difference in sick leave for NBR compared with the control group.

Conclusion: It is uncertain whether there is any difference in duration of sick-leave after NBR compared with usual care for patients with longstanding stress-related disorders.
Very low certainty of evidence (GRADE ⊕◯◯◯).

Self-assessed work ability (Appendix 4:2)
Self-assessed work ability was reported in a Danish cohort study comparing NBR (an all-outdoors vocational rehabilitation programme) with a stress and job management intervention comprising primarily indoor activities, for individuals on long-term sick leave due to sustained stress-related symptoms. The study reported improved self-assessed work ability in both groups three months after the intervention; mean change in the Work Ability Index (WAI) was 1.81 ($p<0.01$) in the NBR group vs 1.10 ($p=0.01$) in the control group. The intergroup difference was not significant. There were no statistically significant changes in self-assessed work ability between three and six months' follow-up in either group, and no significant differences between the groups.

Conclusion: It is uncertain whether there is any difference in self-assessed work ability following NBR compared with non-nature-based multidisciplinary rehabilitation for patients with longstanding stress-related disorders.
Very low certainty of evidence (GRADE ⊕◯◯◯).

Healthcare consumption (Appendix 4:3)
Healthcare consumption was reported in a Swedish cohort study comparing patients in an NBR programme with controls recruited from a healthcare register in the Skåne Region, who had received usual care. Referrals were made due to long-term sick leave for patients diagnosed with depressive disorders and/or reactions to severe stress. The study had major limitations. The number of healthcare contacts was significantly reduced for the cases one year after the intervention compared with one year before (a relative reduction of 16% for the NBR and 8% for the controls, intergroup difference $p<0.05$). The decrease was significantly greater in cases compared with controls concerning primary healthcare (cases Standard Morbidity Ratio (SMR) 0.72, 95% CI 0.68–0.77; controls SMR 0.92, 95% CI 0.90–0.95) and inpatient days in psychiatric health care (cases SMR 0.35, 95% CI 0.31–0.39; controls SMR 0.76, 95% CI 0.69–0.82).

Conclusion: It is uncertain whether NBR results in reduced healthcare consumption compared with usual care for patients with longstanding stress-related disorders.
Very low certainty of evidence (GRADE ⊕◯◯◯).

Outcomes important for decision-making

Perceived stress (Appendix 4:4)
Perceived stress was studied in a Danish cohort study comparing NBR with a stress and job management programme, for individuals on long-term sick leave due to sustained stress-related symptoms. The control programme comprised similar activities but was performed indoors. The study had major limitations. After three months of rehabilitation, both study groups reported a significant decrease in perceived stress; mean change in the Perceived Stress Scale (PSS) was -4.61 ($p<0.01$) in the NBR group vs -4.16 ($p<0.01$) in the control group. No significant changes were found between three and six months' follow-up in either of the study groups. No significant differences between the groups were found at three or six months' follow-up.

Conclusion: It is uncertain whether there is any difference in perceived stress with NBR compared with non-nature-based multidisciplinary rehabilitation for patients with longstanding stress-related disorders. Very low certainty of evidence (GRADE ⊕◯◯◯).

None of the included studies reported the outcomes depression, anxiety, fatigue, cognitive disability or pain.

Findings from the included qualitative studies

Experiences of participating in NBR were studied in three qualitative studies. These studies reported that participants in NBR experienced positive health effects from being in natural environments and working in a garden. Patients with stress-related illness who participated in an NBR programme in the health garden at the Swedish University of Agricultural Sciences in Alnarp, Sweden, expressed that they had adopted a slower pace in their everyday life, and that their everyday activities were more often related to nature and creativity (Pálsdóttir *et al*, 2014B). Other benefits from participating in the Alnarp NBR programme were that participants perceived nature to have different roles corresponding to the three phases of rehabilitation: Prelude, Recuperating and Empowerment. Social quietness was identified as a new and important component of supportive environments to facilitating personal and intimate engagement with the natural environments (Pálsdóttir *et al*, 2014A).

Participants in an NBR programme at the Botanical Garden in Gothenburg, Sweden, expressed that they had received tools and strategies to better manage everyday demands, and that garden and nature was a supportive environment for stress recovery and rehabilitation (Sahlin *et al*, 2012). Experiencing nature's pace and participating in activities in the garden allowed the participants to practice doing one thing at a time, not rushing things and allowing for breaks, which helped them to accept and recognise their own needs and limitations. Through gardening and handicraft activities participants found that their self-efficacy was strengthened.

10. Ethical consequences

Using a technology with uncertain effectiveness may constitute an ethical dilemma, possibly causing displacement effects. On the other hand, there may also be ethical consequences of discontinuing a treatment option that is perceived as beneficial both by patients (as reported in the qualitative studies) and healthcare providers. Although NBR as a comprehensive programme has not been evaluated sufficiently to establish its effectiveness, the intervention is comprised of several commonly accepted treatment methods, involves professions that are recommended in the rehabilitation of ED, and takes place in an environment believed to be a positive resource for relieving stress symptoms and improving mental recovery.

Should NBR be introduced in other units than where it is currently offered, the risk for a displacement effect on other patient groups is considered low because the patients would need care and treatment anyway, probably requiring similar resources

11. Organisation

Time frame for the putative introduction of nature-based rehabilitation

Since 10 years, NBR is offered as a treatment option for stress-related disorders in project form within VGR.

Present use of nature-based rehabilitation in other hospitals in Region Västra Götaland

Nature-based rehabilitation is used in other areas in Sweden, notably at the Swedish University of Agricultural Sciences in Alnarp, where the concept was conceived in 2002. At present about 25 units in Sweden use the concept in one way or another.

Consequences of nature-based rehabilitation for personnel

The consequences are mostly on an educational level, as physiotherapists, occupational therapists and psychotherapists/psychologists need to be trained in the specific theories and methods used in NBR. This training is on the other hand not voluminous, as the professionals mostly work according to their original profession. Another consequence for VGR might be a need to increase present resources in terms of personnel within the professions described above.

Consequences for other clinics or supporting functions in primary care or, at the hospital or elsewhere in the Region Västra Götaland

By introducing NBR for patients with stress-related illness as a permanent activity in VGR primary care, a treatment option that is presently unavailable can be offered. At present, many primary healthcare centres are not able to accommodate this patient group adequately. Nature-based rehabilitation is requested as a treatment option by primary care physicians, Occupational Health Service (OHS) physicians, the Social Insurance Agency, and patients.

12. Economic aspects

Costs of currently used health technologies

Multidisciplinary, group-based rehabilitation that is not nature-based (C1)

According to the database for healthcare consumption in VGR, 732 patients received multidisciplinary rehabilitation (MMR) for either stress-related disorders or chronic pain during 2015. Since multidisciplinary NBR also is included in the statistics, actual patients with multidisciplinary rehabilitation that is not nature-based is approximately 630. According to the government "rehabilitation guarantee", MMR is offered to patients with stress-related disorders or chronic pain, should be at least 4-8 weeks of duration and either contain 40 hours of treatment per patient or 75-100 hours treatment per patient. If the team is composed of at least three professions and offers a minimum of 40 hours treatment it is called MMR level 1 (MMR1) and if the team is composed of at least five professions and offers a minimum of 75-100 hours of treatment it is called MMR level 2 (MMR2). The government reimbursement for MMR1 is 20,000 SEK per patient treated and for MMR2, 40,000 SEK per patient treated. To receive the reimbursement, the patient must have a chronic pain diagnosis. For patients with stress-related disorders without chronic pain, no MMR reimbursement is given; instead reimbursement is given through specific agreements.

Usual care or other rehabilitation that is not nature-based (C2)

In the database for healthcare consumption in VGR, the length of sick leave is not specified. An assumption has been made that if the patient has had three or more visits to primary care due to stress-related disorders (diagnoses F43.X), depression (F32) or anxiety (F41), then the patient is on long-term sick leave. During 2015, 115,000 patients with the diagnoses listed above had visits to primary care. Of those, 40,000 patients (35%) had three or more visits and are defined as patients with long-term sick leave and therefore in need of more treatment and rehabilitation than usual care. A further assumption has been made, based on the expertise and experience in the project group, that a scenario of rehabilitation within primary care would include three visits to a physician and four to eight visits to a psychologist. The annual cost per patient is estimated within the range of 8,000-12,000 SEK.

Estimated costs of nature-based rehabilitation

During 2015, NBR (I) was provided to 101 patients: 50 patients at Grön Rehab Väster, 24 at Grön Rehab Nordost and 27 at Härlanda Örtagård. Gröna Rehab Botaniska offers rehabilitation only for patients employed in VGR (approximately 35 patients annually) and is not included in the statistics. Other units in VGR, where work-oriented NBR is provided by primarily non-healthcare staff, are also not included.

Grön Rehab Väster

The NBR programme in this location is classified as a MMR2 treatment and is reimbursed as such (40,000 SEK per patient that undergoes the programme). The personnel spends a total of 86 hours, including administration, of which the physician spends 10 hours and other personnel spends 76 hours. Each patient in the programme also has two visits to a primary care physician. Furthermore, approximately six to seven referred patients per year not included in the programme are managed by the physician for three hours and by the therapist for four hours. The annual cost per patient in the programme is equal to the reimbursement for MMR2 treatment (40,000 SEK) and hence the annual cost is 2 MSEK.

Grön Rehab Nordost
The NBR programme in this location comprises 12 weeks with three hours twice a week. An occupational therapist and a physiotherapist spend a total of 171 hours in the programme, including administration. Each patient in the programme also has two visits to a primary care physician. Each year, there are three groups with eight participants each. Furthermore, patients on the waiting list are interviewed and administrated, totalling three hours and a referral is administrated for one hour. The estimated annual cost per patient in the programme is 28,000 SEK and the annual total cost is approximately 700,000 SEK. This does not include other overhead costs such as education, supervision of the personnel or investments.

Härlanda Örtagård
The NBR programme in this location comprises 12 weeks with three visits each week. The occupational therapist, physiotherapist and the social counsellor spend a total of 284 hours in the programme. Each year, there are three groups with nine participants each. The estimated annual cost per patient in the programme is 23,000 SEK and the annual total cost is approximately 630,000 SEK. However, not all administration is reported. This does not include other overhead costs such as education, supervision of the personnel or investments.

Gröna Rehab Botaniska
The NBR programme in this location comprises 28 weeks, in total 240 hours per patient. Each year Gröna Rehab Botaniska offers 35 patients, who are employed in VGR, a place in the programme. The annual cost per patient is 72,000 SEK including costs such as rent, garden etc. For this the annual cost is 2.52 MSEK. Gröna Rehab Botaniska also provides other programmes for patients (25 participants per year) in the risk zone for developing ED.

Total change of cost
The total change in actual costs between multimodal NBR and other MMR is the rent and material to the garden and for some locations also the salary to a gardener. The annual change of cost between NBR and other MMR could hence be estimated to 32,000-45,000 SEK per location without gardener and 210,000 SEK per location with gardener.

The cost per patient for MMR2 treatment is 40,000 SEK and the cost per patient with usual care at the primary care is 8,000-12,000 SEK. Hence the change in costs per patients between the two alternatives is 28,000-32,000 SEK.

Possibility to adopt and use the new technology within the present budget
The continued use of NBR cannot be performed within the present budget at all existing NBR units. There is a need to review economic conditions and staffing at the existing NBR units from a sustainable long-term perspective. Staffing varies among the units and is not satisfactory in terms of vulnerability and flexibility where some teams comprise fewer than three staff.

Available analyses of health economy or cost advantages or disadvantages
No health-economic analyses have been identified for NBR.

13. Discussion

The database searches carried out in the present HTA analysis identified only a few studies that fulfilled the PICO and inclusion criteria, indicating a knowledge gap concerning the effects of NBR. The analysis is based on one RCT, two controlled cohort studies, and three qualitative studies. The latter were evaluated and included in the analysis but were not assessed for certainty of evidence. The certainty of evidence for all four reported outcomes was very low.

The two studies that reported sick leave both recruited mainly Swedish patients with ED, and both studies had major limitations. No differences in change of sick leave were found between NBR and controls in either study. The cohort study which reported healthcare consumption showed a significantly larger reduction in number of healthcare contacts in the NBR group than in controls, one year after from one year before the intervention. However, no absolute numbers were reported in the study, making evaluation difficult.

The cost analysis revealed that costs for comparison treatment usual care or other rehabilitation vary the most because the severity of the disorder varies in this group. It is likely that the most complex cases, in most need for more advanced rehabilitation, are treated with NBR or other multi-disciplinary rehabilitation. In complex cases, it is common to receive treatment as usual first and in the next phase enter a multidisciplinary rehabilitation programme, either NBR or multidisciplinary rehabilitation that is not nature-based. It is important to keep in mind that the most serious cases have the longest sick leave and therefore carry the most cost for society.

The present analysis shows that it is uncertain whether multidisciplinary, group-based NBR results in reduced healthcare consumption or has any effect on sick leave, work ability, or perceived stress, compared with multidisciplinary, group-based rehabilitation or other rehabilitation that is not nature-based, or usual care. None of the included studies reported health-related quality of life, depression, anxiety, fatigue, cognitive disability, or pain. No adverse effects of NBR were reported.

The three qualitative studies contribute with knowledge about the patients' experiences of NBR. The patients in the qualitative studies reported for example that NBR provided them with tools and strategies to manage stress, enhanced their self-efficacy and that they found the garden and nature to play an important role in stress-relief.

14. Future perspectives

Scientific knowledge gaps

There is a clear knowledge gap concerning effects of participation in an NBR programme. The findings of this report highlight the need for further research in the area, particularly aiming to standardise this form of rehabilitation and to evaluate its effectiveness using a randomised research design. While conducting the analysis, limitations were also uncovered regarding the registration of the illnesses, diagnoses, treatments, as well as the costs involved. This suggests a need for improved routines within VGR to address these limitations and a need to perform cost analyses of the interventions used. Specifically, a separate treatment code needs to be established for NBR so that it can accurately be distinguished from other multidisciplinary rehabilitation facilitating future research.

Ongoing research

None of the ongoing trials registered in clinicaltrials.gov were relevant for the question in the present report.

Interest at the clinic/research group/organisation to start studies/trials within the research field at issue

Both clinical experience within the project group and evidence from the qualitative studies regarding participants' perceived effects suggest that multidisciplinary NBR has several benefits for the participants' wellbeing and recovery. Further studies in this field using rigorous research design are warranted and the project group will consider developing a proposal for an RCT.

15. Participants in the project

The question was nominated by
Petteri Lackeus, unit manager care needs and patient issues (Ann-Sofie Bäck, handläggare, Hälso-och sjukvård, Regionstyrelsen)

Participants from the clinical departments
Ólafur Aevarsson, registered psychiatrist, PhD, Institute of Stress Medicine, Region Västra Götaland, Göteborg, Sweden
Susanne Bernhardsson, RPT, PhD, Research and Development Primary Health Care, Närhälsan, Region Västra Götaland, Göteborg, Sweden
Agneta Blomberg, student, Sahlgrenska Academy, Programme in Public Health Science, University of Gothenburg, Göteborg, Sweden
Maria Ellsén, RPT, Grön Rehab Nordost, Närhälsan, Region Västra Götaland, Göteborg, Sweden
Anna Ericsson, RPT, PhD, Research and Development Primary Health Care, Närhälsan, Region Västra Götaland, Vänersborg, Sweden
Eva-Lena Larsson, unit manager, PhD, Gröna Rehab, Learning and Communication, Gothenburg Botanical Garden, Region Västra Götaland, Göteborg, Sweden
Gunilla Spalde, registered psychologist, Grön Rehab Väster, Närhälsan, Region Västra Götaland, Göteborg, Sweden

Participants from HTA-centrum
Lennart Jivegård, MD, PhD, Associate Professor, Senior University Lecturer, HTA-centrum, Region Västra Götaland, Sweden
Ola Samuelsson, MD, PhD, Associate Professor, HTA-centrum, Region Västra Götaland, Sweden
Emil Björkander, librarian, Sahlgrenska University Hospital, Region Västra Götaland, Sweden
Therese Svanberg, HTA librarian, HTA-centrum, Region Västra Götaland, Sweden
Josefine Persson, Health economist, MSc, HTA-centrum, Region Västra Götaland, Sweden

External reviewers
Ulla Karilampi, psychologist, PhD, Sahlgrenska University Hospital, Göteborg, Sweden
Robert Eggertsen, MD, professor, Mölnlycke Healthcare Centre, Mölnlycke, Sweden

Conflicts of interest
None reported.

Project time
The HTA was accomplished during the period of 2015-12-02 – 2016-05-25.
Literature searches were made in December 2015.

Appendix 1, Search strategy, study selection and references

Question(s) at issue:

Is multidisciplinary, group-based, nature-based rehabilitation (NBR) more effective than either multidisciplinary, group-based, rehabilitation that is not nature-based, or any other rehabilitation that is not nature-based, for patients with longstanding (>6 months) stress-related disorders, in terms of health-related quality of life, sick leave, work ability, healthcare consumption, perceived stress, depression, anxiety, fatigue, cognitive disability or pain?

P	Patients with longstanding (>6 months) stress-related disorders without ongoing drug abuse
I	Multidisciplinary, group-based, nature-based rehabilitation
C	C1: Rehabilitation that is multidisciplinary, group-based but not nature-based C2: Any other rehabilitation that is not nature-based
O	*Critical for decision making* Health-related quality of life Sick leave Work ability Healthcare consumption *Important for decision making* Perceived stress Depression Anxiety Fatigue Cognitive disability Pain *Not important for decision making* -

<u>Eligibility criteria</u>

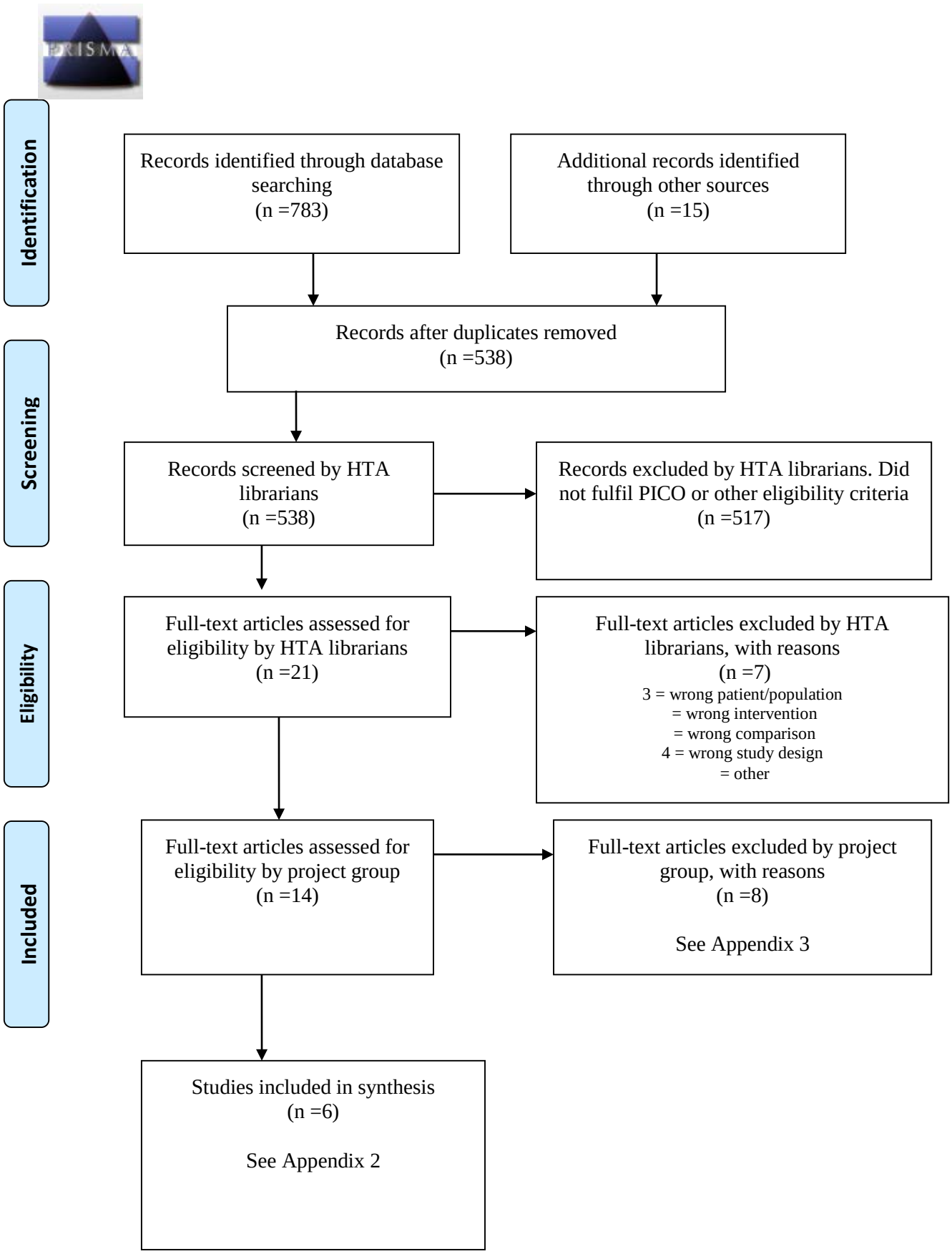
Study design:
RCT
Non-randomised controlled studies

Qualitative studies (> 10 patients)

Language:
English, Swedish, Norwegian, Danish

Publication date: 2000-

Selection process – flow diagram



Search strategies

Database: PubMed
Date: 2015-12-10
No of results: 270

Search	Query	Items found
#28	**Search #20 NOT #21 Filters: Publication date from 2000/01/01; Danish; Norwegian; Swedish; English**	**270**
#23	Search #20 NOT #21 Filters: Publication date from 2000/01/01	291
#22	Search #20 NOT #21	351
#21	Search (Editorial[ptyp] OR Letter[ptyp] OR Comment[ptyp])	1442723
#20	Search #18 NOT #19	351
#19	Search ((eukaryota[mh]) NOT (eukaryota[mh] AND humans[mh]))	4583122
#18	Search #14 OR #17	510
#17	Search #15 AND #16	41
#16	Search treatment OR rehabilitation OR therapy OR therapies	8930949
#15	Search nature-based[tiab] OR nature-supported[tiab] OR nature-assisted[tiab]	139
#14	Search #11 AND #13	487
#13	Search "Horticultural Therapy"[Mesh] OR nature-based[tiab] OR nature-supported[tiab] OR nature-assisted[tiab] OR Gardening[tiab] OR garden[tiab] OR horticultural[tiab] OR horticulture[tiab] Sort by:Author	7517
#11	Search #8 OR #9 OR #10	1318679
#10	Search pain[tiab] OR anxiety[tiab] OR depression[tiab] OR fatigue[tiab]	805895
#9	Search Stress[tiab] OR exhaustion[tiab] OR Stress-related[tiab] OR stress-induced[tiab] OR adjustment disorder*[tiab] OR adaptation syndrome[tiab] OR burnout[tiab] OR burn-out[tiab]	533114
#8	Search ("Stress, Psychological"[Mesh]) OR "Burnout, Professional"[Mesh] Sort by: Author	98587

Database: EMBASE (OVID SP)
Date: 2015-12-10
No of results: 160

#	Searches	Results
1	stroke.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	304465
2	((Stress or exhaustion or Stress-related or stress-induced or adjustment disorder* or adaptation syndrome or burnout or burn-out or pain or anxiety or depression or fatigue) and (nature-based or nature-supported or nature-assisted or Gardening or garden or horticultural or horticulture)).mp. or ((nature-based or nature-supported or nature-assisted) and (treatment or rehabilitation or therapy or therapies)).ti,sh,hw,ab,kw. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	835
3	exp job stress/	4911
4	exp mental stress/	64643
5	exp burnout/	10317
6	(Stress or exhaustion or Stress-related or stress-induced or adjustment disorder$ or adaptation syndrome or burnout or burn-out or pain or anxiety or depression or fatigue).ti,ab.	1678503
7	3 or 4 or 5 or 6	1708509
8	horticultural therapy/	45

9	(nature-based or nature-supported or nature-assisted or Gardening or garden or horticultural or horticulture).ti,ab.	8843
10	8 or 9	8849
11	7 and 10	608
12	(nature-based or nature-supported or nature-assisted).ti,ab.	264
13	(treatment or rehabilitation or therapy or therapies).af.	7425857
14	12 and 13	72
15	11 or 14	655
16	(exp eukaryote/ not (exp eukaryote/ and human)).sh.	5334486
17	15 not 16	439
18	**limit 17 to (embase and (danish or english or norwegian or swedish) and yr="2000 -Current" and (article or conference paper or note or "review"))**	**160**

Database: CINAHL, AMED, PsycInfo (EBSCO)
Date: 2015-12-10
No of results: 325

#	Query	Result
S8	**S4 NOT S5** **Avgränsare - Publikationsdatum: 20000101-20151231**	**325**
S7	S4 NOT S5	347
S6	S4 NOT S5	391
S5	((MH "Plants+") NOT (MH "Plants+" AND MH "Human"))	55,221
S4	S1 OR S2 OR S3	409
S3	((TI Stress OR TI exhaustion OR TI Stress-related OR TI stress-induced OR TI adjustment disorder* OR TI adaptation syndrome OR TI burnout OR TI burn-out OR TI pain OR TI anxiety OR TI depression OR TI fatigue) AND (TI nature-based OR TI nature-supported OR TI nature-assisted OR TI Gardening OR TI garden OR TI horticultural OR TI horticulture)) OR ((TI nature-based OR TI nature-supported OR TI nature-assisted) AND (TI treatment OR TI rehabilitation OR TI therapy OR TI therapies))	59
S2	((AB Stress OR AB exhaustion OR AB Stress-related OR AB stress-induced OR AB adjustment disorder* OR AB adaptation syndrome OR AB burnout OR AB burn-out OR AB pain OR AB anxiety OR AB depression OR AB fatigue) AND (AB nature-based OR AB nature-supported OR AB nature-assisted OR AB Gardening OR AB garden OR AB horticultural OR AB horticulture)) OR ((AB nature-based OR AB nature-supported OR AB nature-assisted) AND (AB treatment OR AB rehabilitation OR AB therapy OR AB therapies))	327
S1	((MW Stress OR MW exhaustion OR MW Stress-related OR MW stress-induced OR MW adjustment disorder* OR MW adaptation syndrome OR MW burnout OR MW burn-out OR MW pain OR MW anxiety OR MW depression OR MW fatigue) AND (MW nature-based OR MW nature-supported OR MW nature-assisted OR MW Gardening OR MW garden OR MW horticultural OR MW horticulture)) OR ((MW nature-based OR MW nature-supported OR MW nature-assisted) AND (MW treatment OR MW rehabilitation OR MW therapy OR MW therapies))	85

Database: The Cochrane Library
Date: 2015-12-10
No of results: 28
Cochrane reviews 2
Other reviews –
Clinical trials 26
Technology assessments -
Economic evaluations -

ID	Search	Hits
#1	Stress or exhaustion or Stress-related or stress-induced or adjustment disorder* or adaptation syndrome or burnout or burn-out or pain or anxiety or depression or fatigue:ti,ab,kw (Word variations have been searched)	158055
#2	nature-based or nature-supported or nature-assisted or Gardening or garden or horticultural or horticulture:ti,ab,kw (Word variations have been searched)	143
#3	#1 and #2	26
#4	nature-based or nature-supported or nature-assisted:ti,ab,kw (Word variations have been searched)	6
#5	treatment or rehabilitation or therapy or therapies:ti,ab,kw (Word variations have been searched)	499989
#6	#4 and #5	5
#7	**#3 or #6**	**28**

Reference lists
A comprehensive review of reference lists brought 15 new records

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Author, Year, Country	Study design	Study follow up (months)	Study groups; Intervention vs control	Patients (n) I + C	Mean age (years)	Men (%)	Study population	Outcome variables
Försäkringskassan, 2013, Sweden	RCT	30	NBR vs usual care	141 + 98	42	0	Women with reduced work ability due to mental illness, primarily ED	Sick leave
Sahlin, 2012, Sweden	Qualitative	N/A	NBR	11	43	27	Patients with ED and/or depression and anxiety	-
Palsdottir, 2014A, Sweden	Qualitative and quantitative[1]	N/A	NBR	21	47	10	Patients with adjustment disorder, reaction to severe stress, or depression	-
Palsdottir, 2014B, Sweden	Qualitative	N/A	NBR	43	46	19	Patients on long-term sick leave for adjustment disorder, reaction to severe stress, or depression	-
Willert, 2014, Denmark	Controlled cohort	7	NBR vs non-nature-based rehabilitation	48 + 45	45	17	Patients on long-term sick leave due to sustained stress-related symptoms	Self-assessed workability, perceived stress
Währborg, 2014, Sweden	Controlled cohort	24	NBR vs usual care	103 + 678	46	11	Patients on sick leave for at least 3 months due to a diagnosis of reactions to severe stress and/or depression	Sick leave, healthcare consumption

NBR=Nature-based rehabilitation; ED=Exhaustion disorder; N/A=Not applicable

[1]Quantitative part = case series and therefore excluded

Appendix 3. Excluded articles

Study author, publication year	Reason for exclusion
Adevi, 2013	Too few patients
Detweiler, 2015	Not concurrent with PICO; wrong population
Eriksson, 2010	Too few patients
Eriksson, 2011	Too few patients
Millet, 2009	Wrong study design (case series)
Sahlin, 2014	Not concurrent with PICO; wrong population (majority not on sick leave)
Sahlin, 2015	Wrong study design (case series)
Sahlin, 2015 (Correction)	Wrong study design (case series)

Project: Nature-based rehabilitation
Appendix 4:1
Outcome variable: Sick leave

* + No or minor problems
? Some problems
- Major problems

Author, year, country	Study design	Number of patients n=	With drawals - dropouts	Results		Comments	* Directness	* Study limitations	* Precision
				Intervention	Control				
Försäkringskassan, 2013, Sweden	RCT	n=239 I=141 C=98	I=41 C=21	Days/month with sick leave compensation At baseline 14* At 20 months 9* <u>Intergroup difference at 20 months:</u> Δ 2* (95% CI -2 to 5*) n.s.	12.5* 7*	A major part of the participants received social insurance benefits. A decrease in sick leave was observed in both groups. 20 months was chosen since it was the mean follow-up time	-	-	?
Währborg, 2014, Sweden	Cohort	n=781 I=103 C=678		Proportion of subjects with any kind of sickness benefits or compensation At baseline 90%* At 20 months 75%* <u>Intergroup difference at 20 months:</u> Δ 15%* n.s.	95%* 60%*	No differences between intervention and control regarding any kind of sickness benefits before or after rehabilitation programme	+	-	?

*) estimated from figures in the report/article

Project: Nature-based rehabilitation
Appendix 4:2
Outcome variable: Self-assessed work ability

* + No or minor problems
? Some problems
\- Major problems

Author, year, country	Study design	Number of patients n=	With drawals - dropouts	Results		Comments	* Directness	* Study limitations	* Precision
				Intervention	Control				
Willert, 2014, Denmark	Cohort	n=93 I=48 C=45		<u>Baseline</u>		Control intervention was a stress & job management program, similar in scope but with all activities performed indoors.	?	-	?
				WAI score 2.24; SD 2.31	WAI score 2.41; SD 2.40				
				<u>Intergroup difference:</u> n.s.					
				<u>Change 0-3 month</u>					
				1.81; 95% CI 1.09 to 2.52 (p<0.01); SMD=0.80; 95% CI 0.48 to 1.12	1.10; 95% CI 0.22-1.98 (p=0.01); SMD=0.49; 95% CI 0.10 to 0.88				
				<u>Intergroup difference</u> Δ 0.70; 95% CI -0.43 to 1.84 (n.s.); SMD=0.31; 95% CI 0.19 to 0.82					
				<u>Change 3-6 months</u>					
				0.64; 95% CI -0.20 to1.49 (n.s.)	0.18; 95% CI -0.82 to 1.20 (n.s.)				
				<u>Intergroup difference:</u> Δ 0.46; 95% CI -0.86 to 1.78 (n.s.)					

WAI=work ability index. Range 0–10; 0 indicates having no ability to work and 10 indicates the lifetime best work ability of the individual; SD=standard deviation; CI=confidence interval; SMD=standardized mean difference

Project: Nature-based rehabilitation
Appendix 4:3
Outcome variable: Healthcare consumption (HCC, number of contacts with a healthcare provider per person per year)

* + No or minor problems
? Some problems
- Major problems

Author, year, country	Study design	Number of patients n=	With drawals - dropouts	Results		Comments	* Directness	* Study limitations	* Precision
				Intervention	Control				
Währborg, 2014, Sweden.	Cohort	n = 781 I = 103 C= 678		Any kind of outpatient health care visit Mean number of outpatient visits per patient:		NBR program was 12 weeks. Controls were retrieved from the Skåne Health Care Register and were matched for main condition, age and sex. Controls received usual care (not specified). 65% in the NBR group and 70% in the control group had exhaustion syndrome. 27% in the NBR group and 29% in the control group had depression.	+/?	-	+
				One year before intervention					
				28.7	18.3				
				One year after intervention					
				24.1	16.8				
				One year after/One year before (SMR/rate)					
				0.84 (95% CI 0.81–0.87)	0.92 (95% CI 0.90–0.93)				
				Intergroup difference p < 0.05					
				Outpatient primary health care visit One year after/One year before (SMR/rate)					
				0.72 (95% CI 0.68–0.77)	0.92 (95% CI 0.90–0.95)				
				Intergroup difference p < 0.05					

Project: Nature-based rehabilitation
Appendix 4:3
Outcome variable: Healthcare consumption (HCC, number of contacts with a healthcare provider per person per year)

* + No or minor problems
? Some problems
- Major problems

Author, year, country	Study design	Number of patients n=	With drawals - dropouts	Results		Comments	* Directness	* Study limitations	* Precision
				Intervention	Control				
				<u>Bed days in hospital</u> One year after/One year before (SMR/rate)					
				0.47 (95% CI 0.43–0.52)	0.94 (95% CI 0.87–1.0)				
				Intergroup difference p < 0.05					
				<u>Bed days in hospital for psychiatric health care:</u> One year after/One year before (SMR/rate)					
				0.35 (95% CI 0.31–0.39)	0.76 (95% CI 0.69–0.82)				
				Intergroup difference p < 0.05					

NBR = Nature-based rehabilitation; SMR = Standard morbidity rate; HCC = healthcare contacts; HD = hospital days

Project: Nature-based rehabilitation
Appendix4: 4
Outcome variable: Perceived stress

*	+ No or minor problems
	? Some problems
	- Major problems

Author, year, country	Study design	Number of patients n=	With-drawals - dropouts	Results		Comments	* Directness	* Study limitations	* Precision
				Intervention	Control				
Willert, 2014, Denmark	Cohort	n=93 I=48 C=45	I=6 C=21	Change from baseline		Control intervention was a stress & job management program, similar in scope but with all activities performed indoors.	?	-	?
				PSS-10 at 3 months					
				-4.61 (95% CI -6.52 to -2.71)	-4.16 (95% CI -6.59 to -1.73)				
				Intergroup difference Δ 0.45 (95%CI -3.54 to 2.63), n.s.					
				PSS-10 at 6 months					
				-1.15 (95% CI -3.53 to 1.23)	-1.82 (95% CI -4.69 to 1.06)				
				Intergroup difference Δ 0.67 (95% CI -3.07 to 4.40); n.s.					

PSS-10 = Perceived Stress Scale, 10-item version. Total score range 0-40; higher score indicates more frequent symptoms. CI = confidence interval.

Appendix 5 Diagnostic criteria

Table 1. Diagnostic criteria for stress-related exhaustion disorder as proposed by the Swedish National Board of Health and Welfare

A. Physical and mental symptoms of exhaustion of at least two weeks' duration. The symptoms have developed in response to one or more identifiable stressors, which have been present for at least six months.

B. Markedly reduced mental energy, which is manifested by reduced initiative, lack of endurance, or increase in time needed for recovery after mental effort.

C. At least four of the following symptoms have been present most of the day, nearly every day, during the same 2-week period:

1) Persistent complaints of impaired memory
2) Markedly reduced capacity to tolerate demands or to work under time pressure
3) Emotional instability or irritability
4) Insomnia or hypersomnia
5) Persistent complaints of physical weakness or fatigue
6) Physical symptoms such as muscular pain, chest pain, palpitations, gastrointestinal problems,vertigo or increased sensitivity to sounds

D. The symptoms cause clinically significant distress or impairment in social, occupational or other important areas of functioning.
E. The symptoms are not due to the direct physiological effects of a substance (such as drug abuse or medication) or a general medical condition (such as hypothyroidism, diabetes and infectious disease).
F. If criteria for major depressive disorder, dysthymic disorder or generalized anxiety disorder are met, exhaustion disorder is considered a co-morbid condition.

Sources:

1. Swedish National Board of Health and Welfare. Utmattningssyndrom. Stressrelaterad psykisk ohälsa. (Exhaustion Syndrome. Stress related mental poor health) (in Swedish) Stockholm; 2003. Bjurner & Bruno AB:2003. ISBN 91-7201-786-4.
2. Ändringar i och tillägg till klassifikation av sjukdomar och hälsoproblem 1997 (KSH97) alfabetisk förteckning. (Changes in and supplement to classifications of diseases and health problems 1997- an alphabetic list.) 2005 (in Swedish).

Region Västra Götaland, HTA-centrum

Health Technology Assessment
Regional activity-based HTA

HTA

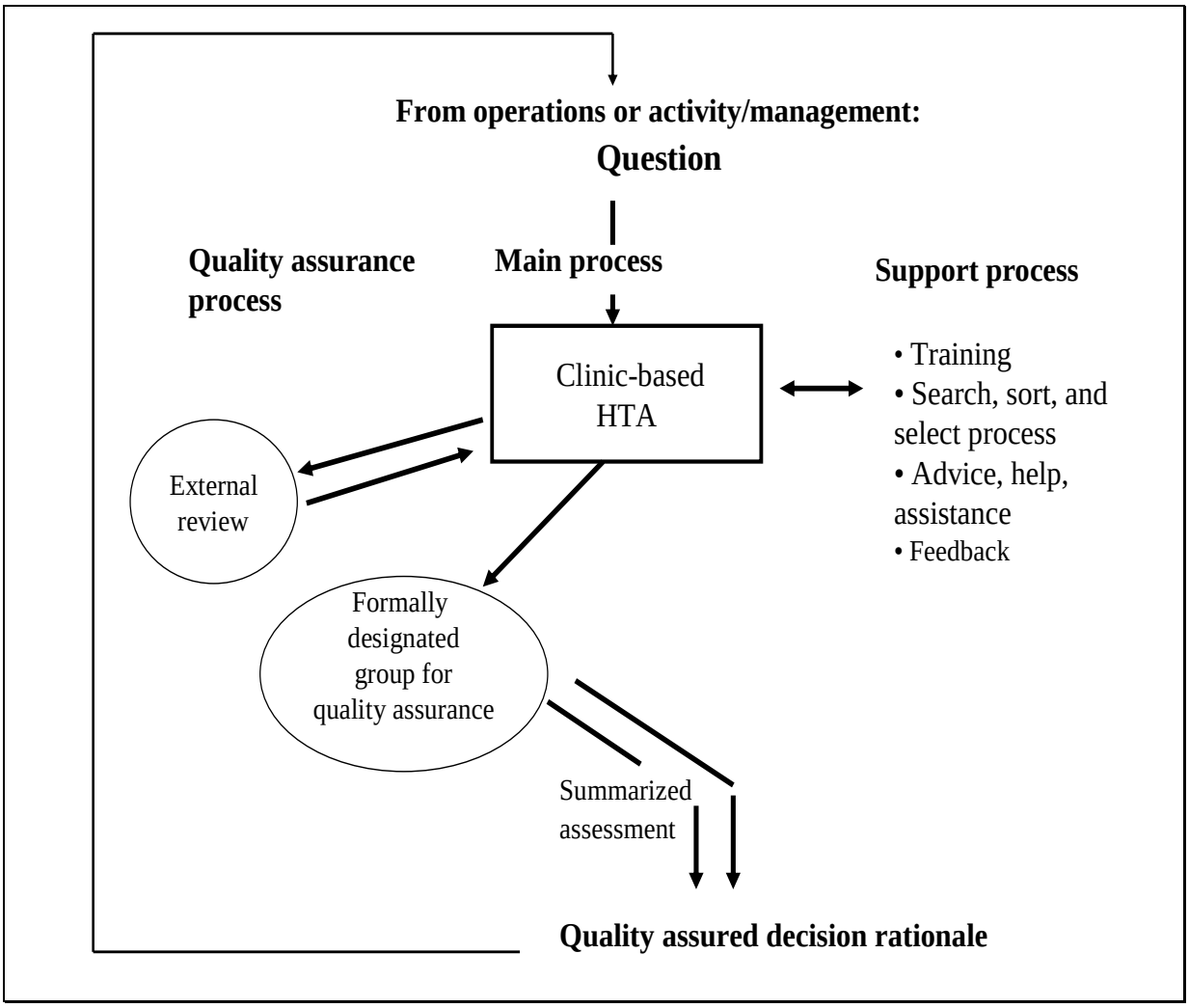
Health technology assessment (HTA) is the systematic evaluation of properties, effects, and/or impacts of health care technologies, i.e. interventions that may be used to promote health, to prevent, diagnose or treat disease or for rehabilitation or long-term care. It may address the direct, intended consequences of technologies as well as their indirect, unintended consequences. Its main purpose is to inform technology-related policymaking in health care.

To evaluate the quality of evidence the Centre of Health Technology Assessment in Region Västra Götaland is currently using the GRADE system, which has been developed by a widely representative group of international guideline developers. According to GRADE the level of evidence is graded in four categories:

High quality of evidence	= (GRADE⊕⊕⊕⊕)
Moderate quality of evidence	= (GRADE ⊕⊕⊕O)
Low quality of evidence	= (GRADE ⊕⊕OO)
Very low quality of evidence	= (GRADE ⊕OOO)

In GRADE there is also a system to rate the strength of recommendation of a technology as either “strong” or “weak”. This is presently not used by the Centre of Health Technology Assessment in Region Västra Götaland. However, the assessments still offer some guidance to decision makers in the health care system. If the level of evidence of a positive effect of a technology is of high or moderate quality it most probably qualifies to be used in routine medical care. If the level of evidence is of low quality the use of the technology may be motivated provided there is an acceptable balance between benefits and risks, cost-effectiveness and ethical considerations. Promising technologies, but a very low quality of evidence, motivate further research but should not be used in everyday routine clinical work.

Christina Bergh, Professor, MD.
Head of HTA-centrum


From operations or activity/management:
Question
Quality assurance process
Main process
Support process
Clinic-based HTA
• Training
• Search, sort, and select process
• Advice, help, assistance
• Feedback
External review
Formally designated group for quality assurance
Summarized assessment
Quality assured decision rationale

VÄSTRA GÖTALANDSREGIONEN
SAHLGRENSKA UNIVERSITETSSJUKHUSET

Sahlgrenska Universitetssjukhuset, HTA-centrum
Röda Stråket 8, 413 45 Göteborg
www.sahlgrenska.se/hta-centrum