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The impact of exposure-based cognitive behavior therapy for severe health anxiety on self-rated health: Results from a randomized trial

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ABSTRACT

Objective: Self-rated health (SRH) has been shown to be a stable predictor of illness and mortality. Improvement in SRH, even in the absence of change in objective health, predicts better health and reduced mortality. Severe health anxiety (SHA) is characterized by fear of illness and distorted health perception. The objective of the present study was to investigate if exposure-based cognitive behavior therapy (CBT) for SHA can lead to improvement in SRH and whether this improvement is mediated by reduced health anxiety.

Methods: Data were collected from a randomized controlled trial where participants with SHA were allocated to 12 weeks of exposure-based CBT (n = 99) for SHA or to a no treatment control condition (n = 33). The mediation analysis was based on SRH- and health anxiety data collected weekly during the treatment phase.

Results: Linear mixed effects models analysis showed a significant interaction effect of group and time indicating superior improvements in SRH in exposure-based CBT compared to the control condition (Z = 2.69, p = 0.007). The controlled effect size was moderately large (d = 0.64) and improvements were stable at 1-year follow-up. Reduced health anxiety was a significant mediator of improvement in SRH.

Conclusions: 12 weeks of exposure-based CBT for SHA can lead to significant improvements in SRH. Considering the previously established importance of SRH as a predictor for disease and mortality, exposure-based CBT for severe health anxiety may lead to improvements on several important health parameters, possibly even increasing the likelihood of longevity.

1. Introduction

In the past 30 years research on self-rated health (SRH) has increased rapidly and a solid body of evidence indicates that SRH is a stable predictor of illness and mortality [1,2]. SRH is typically measured with a simple one-item question reading “How in general would you rate your health?”, with response options poor, fair, good, very good, and excellent. This simple assessment of health has been shown to possess remarkably high predictive validity. In a recent cohort study of approximately 500,000 individuals SRH was the strongest predictor of 5-year mortality across all causes of death in men [3]. In a systematic review and meta-analysis DeSalvo et al. [1] showed that SRH had a large predictive effect on mortality even after controlling for important covariates such as co-morbid disease, functional impairment, and cognitive status.

Idler and Benyamini [2] have suggested several explanations for the predictive effect of SRH. One is that SRH is inclusive, i.e., it is based on all information that the individual has pertaining to his or her health status. This explanation is congruent with the finding that SRH makes a substantial contribution to mortality prediction, over and above physician-assessed health status [4]. Another possible explanation is that SRH reflects a dynamic evaluation process where the individual continuously monitors the body and makes assessment of health based on perceived health trajectories over time. One important aspect pointed out by Benyamini [5] is that, even in the absence of change in objective health parameters SRH trajectory is still a valid predictor of health. This is supported by evidence showing that improvement in SRH despite stability of objective health is related to lower longer-term mortality [6]. That is, becoming more optimistic about one's health – even in the absence of improvement in objective health – is related to better long-term health including likelihood of survival. In sum, SRH is easily assessed, a valid indicator of health, and a strong predictor of mortality.

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Against this background, improving SRH ought to be of high interest for the individual as well as for health care and society.

A concept related to SRH is sickness behavior, denoting a coordinated set of responses characterized by fatigue, pain, anxiety, anhedonia and social withdrawal seen in sick animals and humans [7]. Sickness behavior thus refers to the subjective experience of being sick and the overt behavior in response to pathogens [7]. This process is orchestrated by pro-inflammatory cytokines and typically serves an adaptive function as it motivates the individual to engage in restorative activities. However, an increased level of inflammatory cytokines has also been shown to be associated with more stable psychiatric problems such as major depression and with somatic disorders where inflammation is triggered without presence of a pathogen [7,8]. Research has shown that symptoms of sickness are determinants of SRH [9,10] and that inflammatory signals that cause a sickness response also are related to SRH [11,12]. When health is appraised, symptoms of sickness are thus indicated to influence the process and thereby SRH. It is therefore likely that an intervention or treatment that causes improved SRH will also lead to a reduction of sickness behavior.

Severe health anxiety, in this paper defined as DSM-5 somatic symptom disorder or illness anxiety disorder, is characterized by a persistent and excessive fear of having or acquiring a serious somatic disease [13]. Severe health anxiety is common in medical settings, associated with substantial suffering and functional impairment, and for a majority of the affected the condition is chronic if untreated [14–16]. Our research group has developed an exposure-based cognitive behavioural treatment (CBT), shown to be effective in four clinical trials with large and enduring effects on health anxiety [17–21].

Studying SRH in the context of severe health anxiety is important for several reasons. Firstly, disease conviction or fear of disease is a core feature of severe health anxiety, suggesting that it ought to be negatively associated with SRH. Secondly, recent research has shown that hallmarks of severe health anxiety, namely anxiety and somatic concerns, are similar to SRH in that they are associated with an increase in all-cause mortality [22]. Thirdly, if improvement in SRH (even in the absence of change in objective health) is an important predictor of objective health outcomes, then it is central to investigate if effective treatment of severe health anxiety leads to improvement in SRH. To our knowledge, no previous study has investigated the impact of treatment for severe health anxiety on SRH. In a recently published randomized controlled trial we found that exposure-based CBT was highly effective in reducing health anxiety [20]. As health anxiety is a function of disease perception [e.g. [23]], we regarded it as likely that the treatment would also cause improvement in SRH and that change in health anxiety would be a putative mediator of that effect.

The main aim of the present study was to investigate the effects of exposure-based CBT for adults with severe health anxiety on SRH using data from a randomized controlled trial. We hypothesized that exposure-based CBT compared to an untreated control condition, would lead to significantly larger improvements in SRH. Secondary aims of the study were to investigate if exposure-based CBT would also reduce sickness behavior and if improvements in health anxiety mediated potential changes in SRH.

2. Methods

2.1. Design

This study was based on data from a randomized controlled superiority trial where participants with severe health anxiety were allocated to either 12 weeks of exposure-based CBT ($n = 99$) or to a waiting list control condition ($n = 33$). As reported in the main outcome study [20], participants who received exposure-based CBT were given the treatment in one of three different formats (guided internet-based treatment, unguided internet-based treatment, or as bibliotherapy), but as there were no significant differences between the treatment groups on the primary outcome, the groups were collapsed and analyzed as a single group in the present study. The primary outcome of this study (SRH) was assessed at pre-treatment, weekly during the treatment, post-treatment, at six-month follow-up (6MFU), and at 1-year follow-up (1YFU). As the control condition was crossed over to treatment after 12 weeks no between-group comparisons at 6MFU or 1YFU were possible. The mediation analysis was based on weekly collected data of both the outcome and the mediator during the treatment phase. The study was conducted at the Karolinska Institutet in Stockholm, Sweden, and registered at clinicaltrials.gov (ID NCT01966705). All participants provided informed consent and the trial was approved by the Regional Ethics Review Board in Stockholm.

2.2. Recruitment and participants

This study used nationwide recruitment such that individuals from across Sweden could apply to participate. The main inclusion criteria were that participants had to: (a) have severe health anxiety defined as a principal diagnosis of DSM-5 somatic symptom disorder or illness anxiety disorder, (b) be at least 18 years old, (c) receive no concurrent psychological treatment for severe health anxiety, and (d) have been stable for at least two months if on antidepressant medication and agree to keep the dose constant throughout the study. A licensed psychologist conducted psychiatric assessments using the Mini International Diagnostic Interview [24] and the Health Preoccupation Diagnostic Interview [25]. The diagnostic interviews were conducted via telephone, which has been shown to be a valid method of assessment [26]. Of the 132 included participants 98 (74%) were women and the mean age of the sample was 38.2 ($SD = 12.6$). On average participants had suffered from severe health anxiety for 8.7 ($SD = 10.0$) years. A comprehensive description of the recruitment procedure and participants is provided in the main outcome study [20].

2.3. Measures

2.3.1. Outcomes

The single item Self-Rated Health (SRH) as described in Introduction was the primary outcome in this study and used to assess perceived health in the participants. This instrument has demonstrated acceptable test-retest reliability ($r = 0.75$) as well as excellent validity [3,27]. It has been shown to be associated with objective health measures, disability, quality of life, and comprehensive self-reported measures of health [e.g. [2,28,29]] and has consistently demonstrated strong predictive validity when using mortality as outcome [1].

A validated questionnaire [30] was used to measure state sickness behavior as described in Introduction. The instrument includes 11 ratings of symptoms of sickness behavior (e.g., ""I have pain in my muscles", "My body feels sore", "I feel like I am full of energy") and was rated on a 4-level scale from "agree" to "disagree". The total scale range is 11–44, with higher number indicating more sickness behaviors. The instrument has demonstrated high reliability (Cronbach's $\alpha = 0.79$) and correlated significantly with anxiety ($r = 0.27, p < 0.01$), depression ($r = 0.37, p < 0.01$), self-rated health ($r = 0.34, p < 0.01$) and a one item rating "I feel sick" ($r = 0.54, p < 0.01$) [30]. Sickness behavior as measured with this self-report instrument has been shown to increase in response to experimental activation of the immune system provoking objective sickness behavior [30,31].

2.3.2. Mediator of self-rated health

The putative mediator in the present study was health anxiety as assessed with the short version of the Health Anxiety Inventory (SHAI). The SHAI comprises 18 items (total scale range 0–54) and is designed to measure cognitive, affective and behavioural aspects of health anxiety. The SHAI has been shown to have high test-retest reliability ($r = 0.87$) [32], high internal consistency ($\alpha = 0.96$) [33], and good concurrent and divergent validity [34].