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The Cost-Effectiveness of Cognitive-Behavioral Group Training for Patients with Unexplained Physical Symptoms

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ABSTRACT

Objective: The aim of the study was to evaluate the cost-effectiveness of a cognitive-behavioral group training compared with a wait-list control for patients with unexplained physical symptoms (UPS). **Methods:** A probabilistic decision-analytic Markov model was developed with three health states (poor health, average health, and death) based on a cutoff score of the Physical Component Summary of the short-form 36 health survey. To assess the cost-effectiveness in terms of cost per quality-adjusted life-year (QALY), a societal perspective was adopted. The model consisted of cycles of 3 months and a time horizon of 4 years. Data for the model were derived from a randomized controlled trial, in which 162 patients with UPS were randomized either to cognitive-behavioral group training or to the wait-list control. Data were assessed at baseline and after the training of 3 months or after a wait-list period of 3 months. In addition, the training group was followed in an uncontrolled phase and assessed at 3 months and 1 year after the training. **Results:** After 4 years, the group training was in terms of cost-effectiveness "dominant" compared with the wait-list control; there was a positive effect of 0.06 QALYs and a €828 reduction in costs. The cost-effectiveness improved with a longer time horizon. A threshold of €30,000/QALY was passed after 18 months. The group training was cost saving after 33 months. **Conclusions:** Cognitive-behavioral group training is a cost-effective treatment compared with the wait-list control for patients with UPS.

Keywords: cost-effectiveness, Unexplained physical symptoms, quality-adjusted life-year.

Background

Unexplained physical symptoms (UPS) are physical symptoms that cannot be fully explained on the basis of a known medical condition. These symptoms can be classified as a *Diagnostic and Statistical Manual of Mental Disorders* (Fourth Edition) (*DSM-IV*) somatoform disorder if they 1) are not intentionally produced or feigned, 2) cause clinically significant distress or impairment in functioning, 3) persist for at least 6 months, and 4) are not better accounted for by other *DSM-IV* classifications. Somatoform disorders are common in primary care [1,2]. Their prevalence ranges from 4% (without the prevalence of undifferentiated somatoform disorder and body dysmorphic disorder in a 18–80-year old population) [3] to 16% (without the prevalence of somatoform disorder not otherwise specified in a 25–80-year old population) [4]. By definition, somatoform disorders are accompanied by high levels of psychosocial distress and/or impairment, resulting in lost labor-force and household productivity [5] and in a high use of health care services [6,7]. The high prevalence rate of UPS combined with its high costs make it not only a considerable burden for patients but also an economic burden for society [5,6,8].

Research indicates that cognitive-behavioral therapy is the most effective therapy for UPS [9,10], but research into the cost-effectiveness of this therapy is scarce and has methodological limitations. A recent systematic literature review [11] identified eight economic evaluations of treatments for UPS, of which only two investigated the cost-effectiveness by explicitly combining differences in costs with differences in effects into incremental cost-effectiveness ratios (ICERs) (the ratio of additional costs and additional effects). Even these studies, however, did not use a state-of-the-art cost-effectiveness research design, which makes meta-syntheses difficult, because they did not include costs due to work-related productivity losses, applied a time horizon limited to 1 year [12] or to 3 months [13], and mainly used disease-specific measures of effectiveness such as "cost per unit reduction in Health Anxiety Inventory score" [12] and "cost per additional successfully treated patient" rather than quality-adjusted life-years (QALYs) [13]. The use of such specific effect measures complicates comparisons of cost-effectiveness ratios of

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different treatments not only within the same disease but also between different diseases, such as comparing the cost-effectiveness ratios of treatments for UPS with those of treatments for diabetes. When these comparisons of cost-effectiveness ratios are favorable to treatments for UPS, one would have a strong argument to reimburse treatment of UPS similar to diseases with a known medical diagnosis. Such comparisons require the use of generic effect variables such as costs per QALY, which is the preferred outcome in health economics [14].

In health economics, one tries to incorporate all costs and effects, even if the costs and effects occur in the future [14], complemented with implementation costs. Future costs and effects are, for instance, important if one claims that the initial investment in the treatment is offset by future saving in health care costs elsewhere and can be modeled with a Markov model [13]. Uncertainty in the parameter values can be modeled with probabilistic sensitivity analysis [15].

The purpose of this study was to evaluate the cost-effectiveness of a cognitive-behavioral group training compared with a wait-list control for patients with UPS using a probabilistic Markov model.

Methods

Design

The data for the study emerged from a 3-month randomized controlled trial combined with an uncontrolled 1-year follow-up investigating the effectiveness of cognitive-behavioral group training for patients with UPS [16]. In the trial, after completing the baseline measurement (T0), patients were randomized either to the group training (training group 1) or to a wait-list control group. The treatment effect was measured 3 months later, corresponding with the length of the training (T1).

After T1, patients on the wait-list control also attended the training (training group 2). In training group 2, the T1 was the baseline score (T0) and the training group 2 followed the same procedure as did training group 1. In the uncontrolled follow-up, the outcome for both training groups was measured at 3 months after the end of the training (T2) and once again at 1 year after the end of the training (T3). The study was approved by the Erasmus Medical Research Ethics Committee, and registered in the Dutch Trial Register (NTR 1609) [17]. A detailed description of the study protocol has been published elsewhere [18].

Participants

Participants were recruited in outpatient clinics at general hospitals, and by Riagg Rijnmond, a secondary community mental health service in the Rotterdam area in The Netherlands. General practitioners and specialists were asked to refer patients aged between 18 and 65 years whose physical symptoms, according to their clinical judgment, could not be explained on the basis of a known medical condition. Patients were included if they signed the informed consent and if their UPS fulfilled the *DSM-IV* criteria for an undifferentiated somatoform disorder or a chronic pain disorder using the *Structured Clinical Interview for DSM-IV Axis I Disorders/Patient edition* [19]. Patients were excluded if poor language skills or handicaps, such as cognitive impairment, prevented them from understanding the cognitive-behavioral group training. Table 1 presents the patients' baseline characteristics.

Table 1 – Baseline characteristics.

Characteristic	Group training (n = 84)	Wait-list control (n = 78)
Age (y), mean	46	44
Sex: female (%)	80	82
Physical Component Summary (PCS) score, mean	29.34	29.05
Mental Component Summary (MCS) score, mean	43.68	46.72
Duration of UPS (y), median	8	9.5
Classification of comorbid *DSM-IV* axis I disorders measured by *SCID-I/P*		
Mood disorder (lifetime)	13 (40)	11 (30)
Anxiety disorder (lifetime)	20 (36)	27 (41)
Substance-related disorder (lifetime)	1 (12)	0 (6)
Eating disorder (lifetime)	1 (4)	0 (2)
Psychotic disorder (lifetime)	0 (0)	0 (1)
Somatization disorder	14	10
Hypochondriasis	1	1
Adjustment disorder	2	2

DSM-IV, *Diagnostic and Statistical Manual of Mental Disorders* (Fourth Edition); *SCID-I/P*, *Structured Clinical Interview for DSM-IV Axis I Disorders/Patient edition*.

Cognitive-Behavioral Group Training

The cognitive-behavioral group training is called "Coping with the consequences of unexplained physical symptoms." This weekly 2-hour manual-based [20] training was held over a 3-month period. The group training started with a minimum of 5 and a maximum of 10 patients. Patients assigned to the group training attended, on average, 11 of the 13 sessions, with a minimum of 6. The aim of the group training was to improve health-related quality of life. Corresponding to this aim, the primary outcome measures in the randomized controlled trial were the two component summaries of the 36-item Medical Outcomes Study short-form health survey (SF-36) [21,22]: Physical Component Summary (PCS) and Mental Component Summary. More details of the group training [18,23,24] as well as its effectiveness [16] have been published elsewhere.

Cost-Effectiveness

The randomized controlled trial provided empirical data of the costs and effects of the group training and the wait-list control. The uncontrolled follow-up extended the empirical data by 1 year by following both training groups 1 and 2. It is to be expected, however, that the effect will sustain longer than these periods. We therefore developed a Markov cohort model [15] in which we simulated a cohort of patients that moved through health states over time.

PCS was used as the primary outcome measure [16]. Patients reported the quality of life in the physical domain as most burdensome, compared with that in the mental domain, and PCS had been shown to be a sensitive parameter for the effects of the group training. The Markov cohort model defined three fixed mutually exclusive health states: average health (AH), poor health (PH), and death (Fig. 1). To define AH and PH, a cutoff score of 40 on the PCS was used because the score of 40 was in the middle between the scores of the general population (mean 50 ± 10) and the scores of the patients included in this study (mean = 29 ± 9). AH represented patients with scores higher than 40 on the PCS, and PH represented patients with scores lower than 40 on the PCS.

The variation over time in the effects and in the costs within the health states AH and PH was nonsignificant and assumed to be constant over time. The length of the Markov cycles was chosen to be 3 months, so that the 3 months of the training could