

# The long-term lasting effectiveness on self-efficacy, attribution style, expression of emotions and quality of life of a body awareness program for chronic a-specific psychosomatic symptoms

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## Abstract

**Objective:** A 3-day residential body awareness program (BAP) was developed to teach people with chronic a-specific psychosomatic symptoms (CAPS) to react adequately to disturbances of the balance between a daily workload and the capacity to deal with it. The long-term effects of the program on body awareness, psychological factors, psychosomatic symptoms and quality of life for people with CAPS are presented in this study.

**Methods:** A pre–post design is used with post-measures 2 and 12 months after the program, without controls ( $n = 122$ ). Mean age is 42.5 (S.D. = 9.0) and 60% is female.

**Results:** The results showed an increase of body awareness, self-efficacy, expression of emotions and quality of life. Stress-related symptoms decreased and the attribution style was found to be less depressive. Participants achieved significantly higher levels of functioning at 2 months which increased significantly more at 12 months. The majority of the measured changes can be interpreted as clinically relevant outcomes with medium-to-large effect sizes. Spouses of the participants also confirm the found effects.

**Discussion and conclusion:** Evaluation of the BAP gives evidence to conclude that this program leads to the theoretically expected long-term effects in CAPS. Participants react more adequately to disturbances between daily workload and the capacity to deal with this load. Two and 12 months after the 3-day program, they are more capable of self-management in coping with stress and psychosomatic symptoms.

**Practice implications:** This article sheds new light on the difficulties that individuals with psychosomatic symptoms and their professional interventionists encounter when attempting to manage the chronicity of the problems. By paying more attention to learning self-management by increasing body awareness and self-efficacy, patient educators may be able to increase their effectiveness.

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**Keywords:** Chronic a-specific psychosomatic symptoms; Stress; Self-management; Body awareness

## 1. Introduction

The body awareness program (BAP) as developed at the Lifestyle Training Center in Dalfsen (The Netherlands) was shown to be effective in chronic a-specific psychosomatic symptoms (CAPS) 2 months after the 3-day program [1]. Participants changed their behavior with respect to coping with stress and psychosomatic symptoms, and became more capable of self-managing health problems. These

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participants had symptoms such as chronic fatigue, restlessness and tension, sleeping problems, non-specific pain like headaches and an experience of loss in social function. No psychiatric or somatic diagnoses were present and the problem existed for at least 3 months, often leading to sick leave, extensive medical consultations and use of medicines, and conventional and non-conventional interventions [2–6].

There is no homogeneous term used in the literature for this type of symptoms, which are known as, e.g. “stress-related symptoms”, “generalized anxiety syndrome”, “burn-out”, “surmenage”, “hyperaesthetic emotional syndrome” or “nervous breakdown” [7]. For this study, the syndrome of symptoms was called chronic a-specific psychosomatic symptoms (CAPS).

In prior research of the BAP, a theoretical model was pointed out and the black box of intervening variables was partially opened; the short term results showed already decreased stress-related symptoms, increased quality of life, increased self-efficacy, less depressive attribution style, more expression of emotions and a positive change of lifestyle [1]. There is no general theoretical framework for CAPS to guide the development of programs that address the problem of avoiding chronicity. The major aspects contributing to CAPS include psychological factors like thoughts, feelings, attitudes and beliefs. Social status, gender, life events, physical activity, education and social support can also play a role [8–16]. A rather new perspective is that of the role of body awareness in the development of CAPS, where psychosomatic symptoms are seen as an indicator of a disturbed relationship between the conscious subject and his body [17]. From this perspective, rather than reducing them with treatment, CAPS need to be clarified to the individual by means of increased body awareness. Their role has to be looked at prior to psychological factors. When body awareness fails, psychosomatic symptoms are no longer related to daily stress, there is no effective coping behavior, and this ends in a negative spiral of a growing number of psychosomatic symptoms [17–20].

The aim of the BAP is to increase body awareness in order to modify factors that may influence behavior, such as self-efficacy, attribution style and expression of emotions. Bandura once stated that behavioral changes achieved by different methods derive from a common cognitive mechanism: self-efficacy [21]. Self-efficacy is defined as the strength of one’s conviction that a behavior required to produce a certain outcome can be successfully executed [22]. It is predicted that psychological procedures, whatever their form, alter the level and strength of self-efficacy, which in turn influences performance, including behavior in the self-management of health problems such as pain [23–27]. The attribution style [28] reflects the way individuals appraise the outcome of their own behavior. It is hypothesized that individuals with stress-related disorders like CAPS suffer more often from what is called a depressive attribution style, with failure being attributed mostly to internal factors (internal locus of control) and success to

external factors (external locus of control) [29–31]. The person does not experience control and becomes inactive when confronted with problems like stress [32,33]. A third psychological factor that has a strong impact on behavior is emotion. Emotions are defined as complex, organized psycho-physiological reactions consisting of cognitive appraisals, action impulses and patterned somatic reactions [34]. Emotions should be recognized or faced. This is especially necessary in behavioral change, since change produces stressful situations [16].

The assumption is that by attending to the BAP, the body awareness increases, which means there is more attention to the reactions of the body to stress and more effort to understand these reactions. This way, the body may function as a messenger for stress and the person relies more on it. In turn, by having more confidence in one’s own body, self-efficacy will increase. When self-efficacy increases, the attribution style becomes less depressive and thus emotions are better faced. It is also assumed that with increased body awareness, emotions are more channeled and put in a more realistic perspective, so emotions are better faced. The attribution style will be less depressive when stress signals are better understood by means of increased body awareness. Hence these three psychological factors may be influencing one another, but the exact interdependency is unknown.

It is hypothesized here that people become more aware of their reactions to stress and will be more active and effective in their efforts to reduce the negative impact of stress in order to attain their personal goals in life. This produces a change of behavior in terms of new lifestyles, in accordance with the stages of change of the transtheoretical model of behavioral change [35–37]. In this model of behavioral change, people are willing to change within 6 months (contemplation phase) or within 1 month (preparation phase). After the program, participants actually change their behavior, which means they are able to realize their personal pre- and post-training goals (action phase). The expectation is that this changed behavior will help participants prevent relapse and definitively leave the negative spiral of producing symptoms when confronted with stress (maintenance phase). The balance between daily workload and relaxation will be restored. As a long-term lasting result, there will be an increase in quality of life, which is defined as the individual’s perception of his position in life in the context of the culture and value systems in which he lives and in relation to his personal goals, expectations, standards and concerns [38].

Several studies have demonstrated the long-term effectiveness of various meditation techniques in reducing symptoms of stress [39–42]. Various stress-management techniques, such as relaxation training [43] and multimodal stress-management programs [44], have been developed in order to teach people how to prevent and reduce stress-related symptoms. Studies of these extended programs showed positive psychological, social and physiological

long-term effects [45–50]. However, there is no evidence of the lasting effects of a short program on body awareness.

The purpose of the present study was to determine the lasting (long-term) effects of the BAP. The overall research question is: “What is the effectiveness in the long run of the Dutch BAP in individuals with chronic a-specific psychosomatic symptoms?” This includes the following specific questions:

1. Is there a lasting effect of the BAP on the increase of body awareness?
2. Is there a lasting positive effect of the BAP on self-efficacy, attribution style and expression of emotions?
3. Is there a lasting effect of the BAP on the increase of quality of life: a reduction in self-reported psychosomatic symptoms, an increase in independence in physical health and in social relationships, and a decrease of environmental problems?

In this article, the focus is on body awareness, self-efficacy, attribution style, expression of emotions and quality of life. Other long-term outcomes measured in this study [51], more related to changing behavior, will be discussed in a forthcoming article, entitled “Improvement of balance between work stress and recovery after the BAP for chronic a-specific psychosomatic symptoms”.

## 2. Methods

### 2.1. The Dutch body awareness program

The BAP is a highly structured and standardized program. The format is a 3-day pressure-cooker course that participants attend in groups of 14 participants. They also eat and sleep at the institute. Two coaches (male and female), who are certified for the applied techniques, remain with the group for the total period of 3 days. Although it is a personal goal-oriented program and not a group therapy, the BAP involves various methods and techniques given in eight group sessions. It includes learning attentional control to develop non-judgmental, moment-to-moment awareness of physical sensations, feelings and thoughts through a number of mind–body practices [52–54]. During the BAP, participants focus on and try to understand the meaning of “distracting” thoughts, sensations and physical discomfort instead of ignoring them. This focusing is called mindfulness or awareness meditation [55]. One of the techniques used is Alexander Lowen’s bio-energetics [56], in which participants are invited to make contact with their feelings by means of breathing, movement and voice.

Other techniques to increase body awareness as used in the BAP are derived from haptonomy. This is a word used for the insights of Frans Veldman [57] on body awareness, where touch is one of the major themes. An extensive description of the BAP is given elsewhere [58–60]. Fig. 1

presents the body awareness program model, giving an outline of the hypothesized relationships between the above-mentioned concepts. Four domains are distinguished, structured with the help of Chen’s program evaluation theory [61], which is comparable to the mediation model as proposed by Kraemer et al. [62]:

1. The treatment domain, in which the changes intended with the BAP are effected.
2. The implementation environment domain, in which the environment in which the BAP was implemented is described.
3. The outcome domain, in which the intended outcome of the BAP is described.
4. The intervening mechanisms domain, which describes the underlying mediating variables, linking the BAP to its outcome. Those variables are derived from two distinct theories: action theory (linking the BAP to its intervening mechanisms) and conceptual theory (linking the intervening mechanisms to the outcome).

The shaded arrow and five blocks are under study in this paper and represent the three posed research questions.

### 2.2. Procedure

This pre–poststudy is based upon the principles of theory-driven evaluation [61]. Posing a theoretical model as described above offers some opportunities to explain how and why the program achieves or lacks results [61,63,64]. The underlying theories are explained and used in selecting outcome measures. The most relevant outcome variables, derived from the underlying theory, are included within the study; this enhances the possibility of finding non-trivial program effects.

Before as well as 2 and 12 months after the program, all subjects were asked to complete and return mailed questionnaires. The training was monitored by evaluation forms, journals and scanning methods that included interviewing coaches during and after the program as well as observations [61].

### 2.3. Subjects

Fig. 2 gives an overview of the selection of subjects and response rate.

A self-selection of the group under study took place over a period of 2 years in 47 different BAP groups ( $n = 648$ ). From this group, 329 participants were selected using the registration forms and telephone interview with CAPS. The other 319 either suffered from specific symptoms like heart failure or post-whiplash syndrome, or had no physical or mental symptoms. A total of 282 adults filled in the first questionnaire at baseline (response 86%). The non-response group of 47 persons forgot to fill in the questionnaire ( $n = 21$ ), stated they found it too lengthy and did not want to

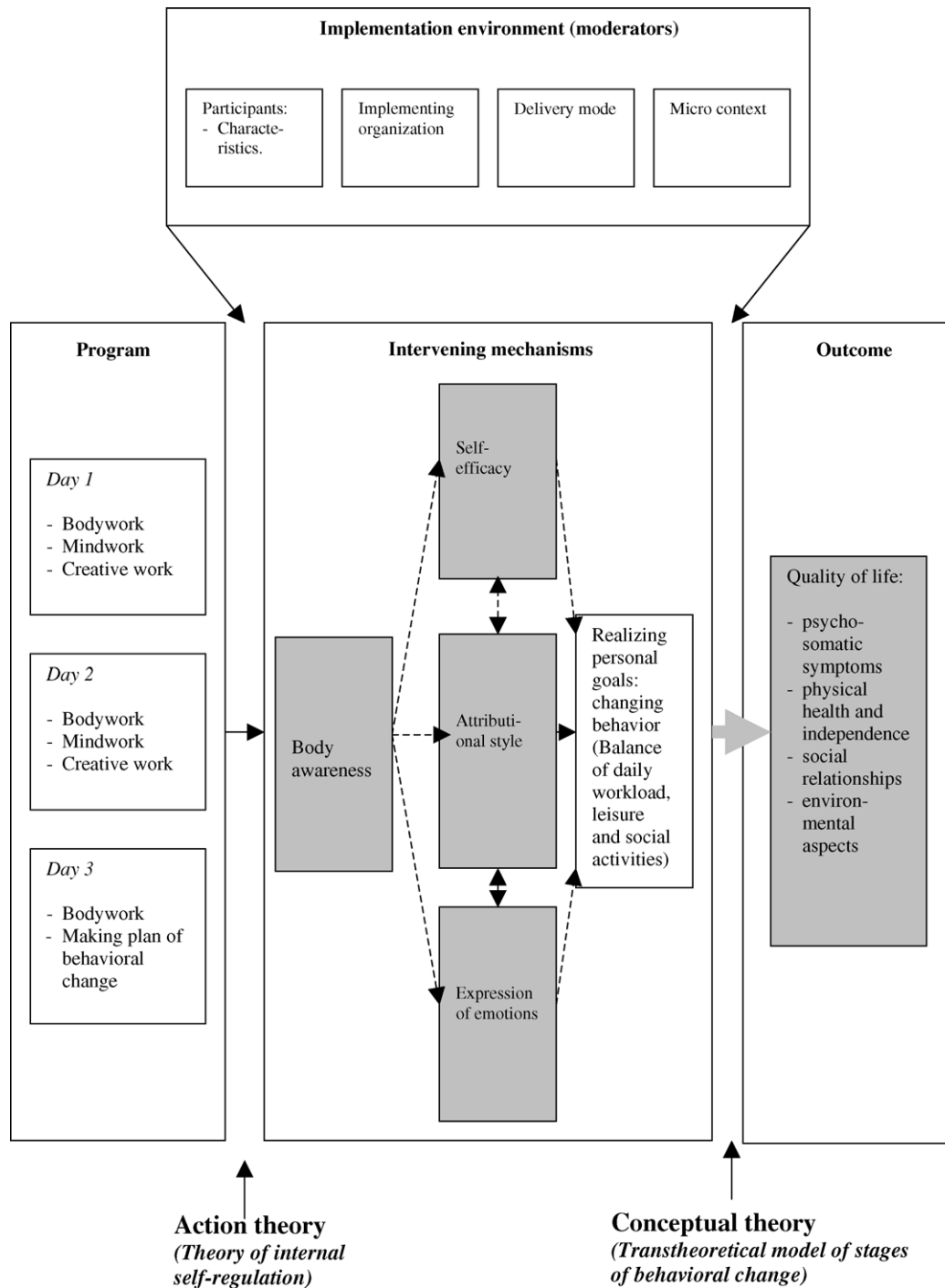


Fig. 1. The body awareness program model.

cooperate ( $n = 10$ ), or did not attend the BAP ( $n = 16$ ). From the response group of 282 participants, 187 returned the post-test questionnaire as described below (response 66%) 2 months after the program. Respondents who actively stopped cooperating with the research program, either notifying the program by phone or in writing or by not responding, did not receive further questionnaires.

At post-test, 38 respondents stopped actively, so 187 follow-up-tests were sent off (see Fig. 1), with 142 respondents

returning this follow up questionnaire (response 76%) and 34 actively ending their cooperation with this research. Of the 142 participants who returned all three measurements, 20 participated in another BAP within a year. These questionnaires were not analyzed further because the research question is about the effects of one 3-day BAP. The sample for this paper of long-term effects was formed by 122 respondents.

A non-response evaluation among the 140 non-respondents by telephonic interviews ( $n = 25$ ) or written explana-

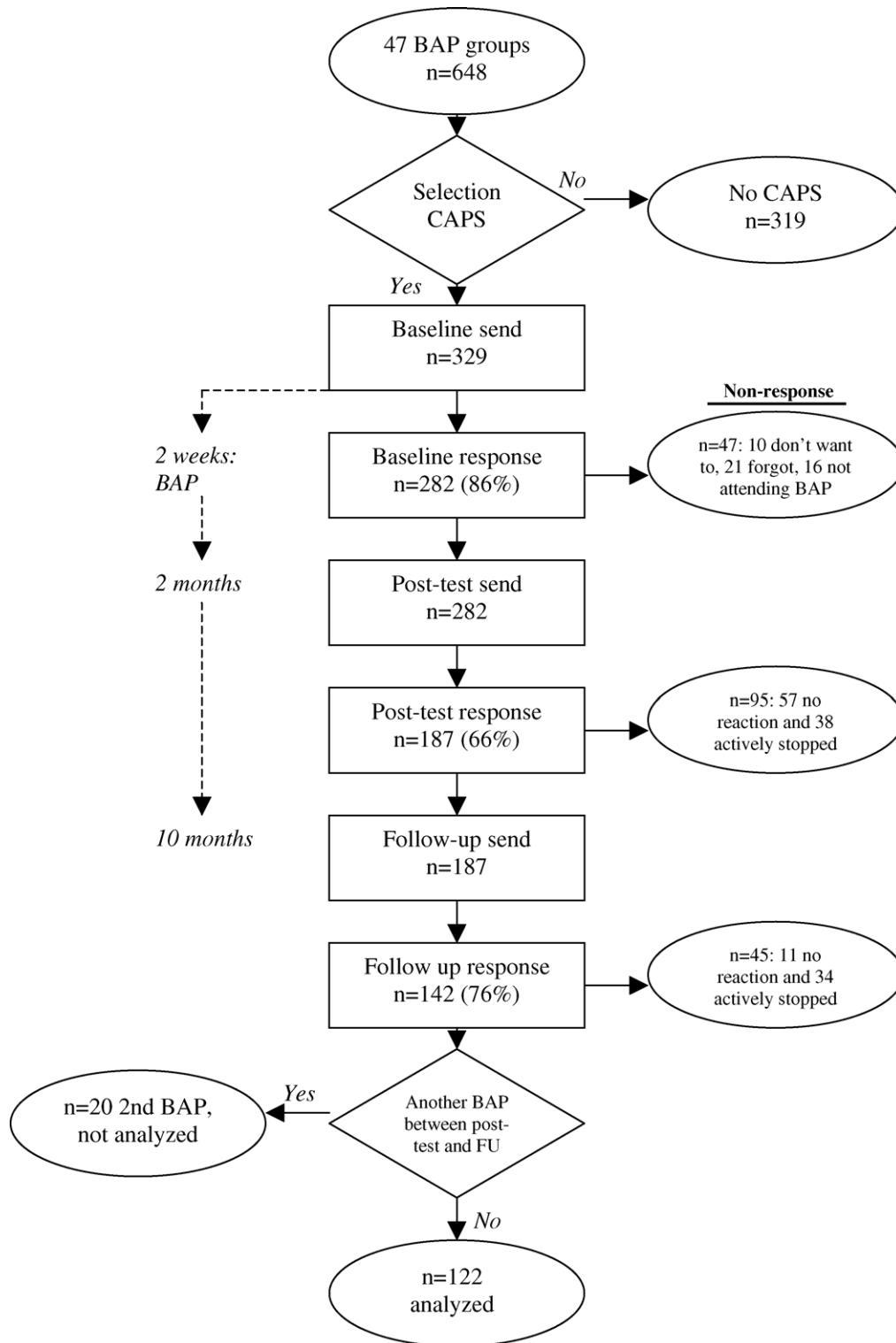


Fig. 2. Selection of the group under study and response at post-test and follow up.

tion about their reasons to quit ( $n = 72$ ) showed no statistical difference in characteristics (gender, age and educational level) or in experienced effects (goalrealization and SCL-90 scores; see measures) from the BAP. Participants' main reasons not to respond were being too busy and/or not motivated to fill in the inventories. The 43 participants who

did not cooperate in the non-response evaluation where either not willing to cooperate ( $n = 3$ ) or did not answer the phone, mostly because of a changed address ( $n = 40$ ).

Demographics are tabulated in Table 1. The majority of the subjects were married (80%) and had attended College or University (55%). The mean age was 42.5 (S.D. = 9.0) with

Table 1  
Baseline subject demographics ( $n = 122$ )

Demographics	% of subjects
Age	
<30	8
30–39	30
40–49	47
≥50	15
Gender	
Male	40
Female	60
Marital status	
Married	80
Single	20
Highest educational level	
Technical and vocational training ages 12–16	12
Technical and vocational training ages 17–18	33
Technical and vocational training >18	32
University	23

a minimum of 26 and a maximum of 65 years. The SCL-90 scores for all individuals were above the norm score for “normal people” and on the norm score for people with chronic pain [65]. This means that besides physical symptoms, psychosocial factors play a role in the development and maintenance of CAPS. The four most mentioned symptoms of these participants were fatigue, tension, sleeping problems and headaches.

#### 2.4. Measures

The questionnaires filled in by all respondents at baseline and follow up were four mediating variables: (1) body awareness, (2) self-efficacy, (3) attribution style, (4) expression of emotions; and two outcome measures: (5) psychosomatic symptoms, (6) quality of life.

Body awareness is defined as paying attention to or having thoughts about the body and how it feels in different daily life situations. In a stressful situation, the individual experiences a discrepancy between his perceived and his desired state. There is no appropriate scale to measure body awareness, so three different instruments strongly related to the content of the BAP were used to gauge the dimensions of daily experience, psychosomatic symptoms and goal realization. With respect to quantitative information about changed body awareness, the three instruments give the same outcome: no mentioned change, no change, or positive/negative change. To analyze changed body awareness, the answers on the questionnaires were categorized as follows: (0) nothing was written down about body awareness; (1) indication of a deterioration of body awareness; (2) indication of no change of body awareness; (3) indication of improvement.

For the dimension of daily experience, a body awareness within daily experiences scale of Kabat-Zinn was translated for this study into Dutch [66]. Respondents were asked to

write down experiences about work satisfaction, stress, enjoying life in general, having fun privately, anxiety and misunderstanding. For every experience, four questions were asked: (1) what did you feel in your body? (2) which feelings, thoughts and mood was this experience accompanied with? (3) what was the influence on your behavior? and (4) what thoughts are coming up while writing all this down?

For the second dimension, psychosomatic symptoms, body awareness was measured by a questionnaire with retrospective questions about how psychosomatic symptoms change because of the BAP [53]. The questions stated: “did (1) psychological and (2) physical symptoms change after the BAP?” The answers on this questionnaire were categorized as follows: solved, improved but not completely solved, unchanged or deteriorated. Respondents were also asked to explain their answer and describe the way they changed their coping behavior for problems and symptoms due to the BAP and/or other influences. The statements made for this explanation were categorized.

For the third mentioned dimension, realizing personal goals, body awareness was measured according to the principles of goal attainment scaling. This is a valid and reliable method in which the participant scales his own goals in the degree to which they were realized [67]. Before, during and after the program, individuals were asked to indicate their personal goals and plans. Of these goals, 89% concerned changing coping behavior related to body awareness. At follow up, people were confronted with a copy of their own written goals and plans, and asked if and to what extent these were attained.

The physical self efficacy scale [68] was used to measure self-efficacy. The inventory turned out to be reliable and valid in English and was translated into Dutch for this study, but not validated. It asks “how certain are you that you can” in 12 items, and answers range in a five-point Likert scale from “very uncertain” [=1] to “very certain” [=5]. The higher the score, the higher the self-efficacy.

The Dutch version of the attribution style questionnaire was used to measure attribution style. This inventory was found to be valid and reliable in the English and Dutch versions [31,32]. For three positive and three negative daily events, the questions were: “what causes this situation?”, “is this situation caused by yourself or fully by others or circumstances?”, “when this situation happens again, will it have the same outcome?”, and “will the mentioned cause always be there?”. These questions are answered in a scale ranging from 1 to 7. The higher the score, the less “depressive” the attribution style.

To measure expression of emotions, a combination of the Courtald emotional control scale and the State, Trait, Anger expression inventory was used [69–71]. This questionnaire was translated into Dutch and found to be reliable and valid in research [72]. The inventory gives statements about three different emotions: anger, anxiety and gloominess. For every emotion, three possible coping strategies are incorporated:

withdrawal, expression and non-expression. The respondents were asked to indicate how they normally behave on a five-point Likert Scale ranging from “almost never behave like that” [=1] to “almost always behave like that” [=5]. A higher score means better recognition of emotions.

The Dutch version of the Hopkins SCL-90 was used for a reliable and valid measure of stress-related symptoms [65]. It is a 90-item instrument consisting of the following eight subscales: phobic anxiety, anxiety, depression, somatization, obsessive-compulsive behavior, interpersonal sensitivity, hostility and sleeping problems. A lower score means less symptoms. The SCL-90 measures overall psychological distress, calculated as the general severity index (GSI score = sum of all 90 items) [73,74].

A visual analogue scale ranging from 1 (no symptoms at all) to 10 (symptoms are unbearable) was used to measure perceived severity of the symptoms. For 1 week, this scale was filled in every day in order to get a reliable and valid average score over a period of 7 days [75,76].

Quality of life was measured with the World Health Quality of life scale [77–79]. The short version with 26 items was shown to be sensitive to change as well as valid and reliable in a study by O’Carroll et al. [79]. There are four domains measured: physical health and independence (seven items), psychological health (six items), social relationships (three items) and environment-related aspects like feeling safe, having access to recreation and being satisfied with living conditions (eight items); two separate items are added up and measure overall quality of life. A higher score means a better quality of life.

### 2.5. Analysis

The analysis includes all 122 subjects and determines if the difference between pre-test and follow up-test was significant ( $p < 0.05$ ). When missing values frustrated the calculation of sum scores, the mean scores of all other items of the scale replaced the missing value so sum scores could be calculated. First there was a multivariate test conducted following a general linear model in SPSS with the design of intercept (Wilks’ Lambda). Second, the univariate non-parametric test used for this analysis is a Friedman test for three or more dependent variables [80]. To test if the short-term effects were lasting and if there were delayed effects, the post-test and follow up-test (2 and 12 months after the 3-day BAP) were compared with the non-parametric Wilcoxon Signed Ranks test. With a one-way ANOVA procedure it was tested if the different BAP-groups had the same results. Pearson’s correlation coefficients were used to express the correlation between the subscale sum scores of the mediating factors of self-efficacy, attribution style and expression of emotions. To validate the theoretical model, discriminant analysis was used to obtain information about the predictive value of these three potentially causal variables. The mean-total scores of the difference between pre-test and follow up-test were recoded in two groups: a

group with low effect and a group with high effect. The cutpoint was made at the median. Then a non-parametric Mann–Whitney test was conducted to assess the hypothesized difference in the outcome measures for psychosomatic symptoms and quality of life.

Effect size statistics were used to supplement the statistical testing to assess the clinical relevance of the results. Several effect size measures are known and used [81–84]. In this study, Cohen’s effect size statistic  $d$  for paired observations was used [85]. As the variance of the post-test measure is partly explained by the pre-test scores, estimating the magnitude of change requires adjustment of the effect size  $d'$  for the correlation ( $r$ ) between baseline and post-test scores.

Cohen defined his effect sizes as follows: trivial effect ( $<0.20$ ), small effect ( $\geq 0.20$  and  $<0.50$ ), medium effect ( $\geq 0.50$  and  $<0.80$ ) and large effect ( $\geq 0.80$ ). In Middel’s study, these thresholds for Cohen’s  $d$  concurred significantly with the external criterion of patients undergoing treatment, i.e. experiencing no change, a little improvement, moderate improvement and a great deal of improvement [81]. In American research, clinically important differences in health status measurements were stated at 0.30–0.50 [86]. This study’s clinically relevant change was stated at a  $d \geq 0.50$ .

## 3. Results

Results of monitoring and scanning the BAP in the 47 measured groups showed that the program was conducted as planned. A one-way ANOVA procedure showed no statistic significant differences in results on causal or outcome variables between the 47 groups. The effects all point in the same direction. In the multivariate test of between-subject effects, all measured variables were found to be significant.

### 3.1. Changing body awareness by the BAP

The answers to the questions about coping behavior for stress and symptoms on the three measured dimensions of daily experience, psychosomatic symptoms and goal realization are diverse, but most of them (82%) point in the direction of an increased body awareness (Table 2). There was no negative effect mentioned on body awareness. The statements in Table 2 about “body awareness not mentioned” and “body awareness did not change” were all derived from the goal-realization questionnaire. Statements about improved body awareness were mostly found in the goal-realization questionnaire (88%) and in the questionnaire about changed coping behavior for stress and symptoms (22%). In the questionnaire about daily experience, 84% of the respondents mentioned body awareness, but not statements about improvement of this variable.

Table 2  
Follow up-test results of changed body awareness ( $n = 122$ )

Category	Percentage	Examples of statements about body awareness
Body awareness deteriorated	0	No statements
Body awareness was not mentioned	11	“Confrontation with the past and with stressful situations is still very emotional, but I’m coping better by talking about my problems” “I have a lot of stress at work” “I found ways to be less of a perfectionist and to worry less”
Body awareness was mentioned but did not change	7	“The training helped me to get more social contacts, and I can feel stress in my body, but really changing behavior is difficult” “I still get a headache when I experience a lot of stress”
Body awareness improved	82	“I am more aware of my feelings and bodily reactions in different situations, therefore I take actions more effectively and have less symptoms” “The training made me more calm and more aware of myself and my priorities in life” “I have more energy and creativity to do the things I want to” “I feel in my body that I can cope better with situations in which I feel no control” “I now trust my feelings more when it comes to interactions and communication with important persons in my life”

### 3.2. Effect of the BAP on psychological factors

There is a significant and clinically relevant increase of self-efficacy ( $p < 0.05$  and  $d \geq 0.5$ ) on all measured items except working without problems and influencing pain without medication (see Table 3). Those two items changed significantly, but not in a clinically relevant manner according to Cohen’s  $d$  ( $d = 0.4$ ).

There was a tendency measured of a less depressive attribution style. A few measured differences were found to be significant, and one showed clinically relevant changes, according to the measured effect size  $d$ , i.e. the item “rapidly being accepted at a new job environment” (Table 3).

When faced with emotions of anger, anxiety or gloominess, the participants used a clinically relevant, significantly more expressive and less withdrawn coping style (Table 3). The “staying in control” coping style did not change.

### 3.3. Changing quality of life after the BAP

The average GSI scores decreased significantly and were clinically relevant from an average score of 156–137 and 132 at follow up, as shown in Table 4. This is also the fact with the average raw scores of every subscale of the SCL-90. Only the effect size  $d$  of the scores on the “phobic anxiety” subscale was lower than 0.5, i.e. not clinically relevant, but changed in a positive direction.

The VAS scores regarding perceived symptoms decreased significantly and were clinically relevant according to the measured effect size  $d$ . Table 4 gives the mean scores. Quality of life on all four measured domains increased significantly ( $p < 0.05$ ), as shown in Table 4. Although the “social relationships” domain changed in a positive direction, it was the only measured item that did not present clinically relevant changes ( $d = 0.3$ ).

### 3.4. Correlations and discriminant analysis

Pearson’s correlation coefficients between the sum scores were low and not significant for the attribution style ( $r = 0.03$  with emotion and 0.14 with self-efficacy). Self-efficacy and expression of emotions did correlate moderately and significantly ( $r = 0.31$  and  $p = 0.001$ ). At baseline, high-effect and low-effect groups analyzed on psychological factors did not differ from each other on the measured variables of process and outcome or on age, gender and educational level. The self-efficacy scale was an exception: participants with a low self-efficacy score benefit most on self-efficacy. The discriminant analysis showed significant relations between all three proposed causal psychological factors and outcome variables as shown in Table 5. A better expression of emotions does not seem to influence quality of life though ( $p = 0.232$ ). A higher score on the emotion scale did seem to have a significant negative effect on GSI scores ( $p = 0.017$ ).

## 4. Discussion and conclusion

Major findings of this study suggest that participation in this 3-day body awareness program was effective in terms of (1) increased body awareness, (2) increased self-efficacy, (3) a less depressive attribution style, (4) more expression of emotions, (5) increased quality of life, and (6) reducing psychosomatic symptoms.

These observed reductions in psychological symptomatology are consistent with the findings of other researchers who have been studying enduring stress-reduction programs [46,48,50,87]. Follow up analysis showed that the positive changes after 2 months improved further at 12 months. This is an unusual and promising result because, in accordance with the transtheoretical model of behavioral change, lasting positive effects on

Table 3

Pre-, post- and follow up-test results of psychological factors: self efficacy, attribution style and expression of emotions ( $n = 122$ )

	Pre-test		Post-test		Follow up		$p_1^a$	$p_2^a$	$r^a$	$d^a$
	M	S.D.	M	S.D.	M	S.D.				
Self efficacy items (scores 1–5)										
Working without problems	3.1	1.2	3.3	1.15	3.5	1.1	0.001	0.013	0.4	0.4
Influencing fatigue	3.1	1.0	3.6	0.9	3.6	1.0	0.000	0.904	0.3	0.5
Daily activities without symptoms	2.9	1.0	3.3	1.0	3.3	1.0	0.000	0.586	0.4	0.5
Self-help to feel well again	3.4	0.9	3.7	0.8	3.8	0.8	0.000	0.808	0.3	0.6
Influencing pain without medication	3.2	1.0	3.5	0.9	3.5	0.9	0.001	0.815	0.3	0.4
Influencing symptoms to enjoy life	3.3	0.9	3.5	0.9	3.7	0.8	0.000	0.004	0.4	0.6
Relaxing, even with symptoms	2.8	1.0	3.2	0.9	3.4	0.9	0.000	0.054	0.4	0.7
Relaxing, even with stress	2.5	1.0	3.0	1.1	3.1	1.0	0.000	0.081	0.5	0.9
Being open at work and/or privately	3.2	1.1	3.6	0.9	3.8	0.9	0.000	0.074	0.4	0.7
Saying no at work and/or privately	2.7	1.1	3.4	1.0	3.5	0.9	0.000	0.060	0.4	1.1
Making choices	3.0	1.2	3.6	1.0	3.7	0.9	0.000	0.183	0.5	1.0
Enough variety in daily (work)load	2.8	0.9	3.4	0.8	3.5	0.8	0.000	0.057	0.6	0.9
Attribution Style Items (scores 1–7)										
Failure										
Unable to relax when having painful and/or tight muscles										
External	5.3	1.4	5.4	1.4	5.3	1.49	0.314	0.276	0.5	0.0
Stable	5.1	1.3	4.7	1.3	4.9	1.28	0.048	0.124	0.2	0.2
Specific	4.8	1.6	4.6	1.7	4.6	1.63	0.283	0.845	0.3	0.1
Unable to enjoy time to relax when you have the time										
External	5.4	1.4	5.6	1.4	5.7	1.11	0.153	0.425	0.4	0.2
Stable	5.0	1.3	4.9	1.4	4.8	1.26	0.239	0.479	0.3	0.2
Specific	5.0	1.6	4.8	1.6	4.7	1.57	0.103	0.901	0.2	0.1
To much workload, unable saying “no” to more work										
External	5.5	1.3	5.3	1.5	5.3	1.42	0.199	0.550	0.3	0.2
Stable	5.1	1.5	4.7	1.5	4.7	1.49	0.001	0.378	0.4	0.4
Specific	5.3	1.3	5.0	1.6	4.8	1.57	0.035	0.678	0.4	0.4
Success										
Rapidly being accepted at a new job environment.										
External	5.1	1.0	5.3	1.1	5.6	0.95	0.000	0.024	0.5	0.7
Stable	5.6	1.2	5.9	1.1	5.9	1.05	0.001	0.781	0.5	0.4
Specific	5.5	1.3	5.6	1.3	5.8	1.17	0.071	0.093	0.5	0.3
Exercising consequently.										
External	5.5	1.6	5.7	1.3	5.7	1.47	0.475	0.932	0.3	0.1
Stable	5.7	1.2	5.8	1.1	5.8	1.23	0.318	0.705	0.3	0.1
Specific	5.3	1.5	5.4	1.5	5.4	1.41	0.268	0.990	0.2	0.1
Talking to a group of people and noticing you are understood.										
External	5.3	1.4	5.7	1.1	5.5	1.04	0.001	0.259	0.2	0.2
Stable	5.4	1.2	5.4	1.2	5.7	0.95	0.001	0.022	0.3	0.4
Specific	5.1	1.2	5.1	1.4	5.4	1.14	0.002	0.058	0.3	0.3
Expression of emotions Items (score 1–5)										
Withdrawal (non-expression)										
Anger	3.2	1.3	3.4	1.1	3.6	1.06	0.000	0.067	0.5	0.5
Anxiety	3.5	1.2	3.7	1.1	3.9	1.08	0.000	0.013	0.6	0.6
Gloominess	3.1	1.3	3.3	1.2	3.5	1.16	0.001	0.188	0.4	0.4
Expression										
Anger	2.4	1.1	2.6	1.1	2.9	1.12	0.000	0.032	0.5	0.6
Anxiety	2.4	1.0	2.7	1.0	2.8	1.04	0.000	0.170	0.5	0.5
Gloominess	2.2	1.0	2.4	1.1	2.6	1.19	0.006	0.052	0.5	0.4
Staying in control										
Anger	3.0	1.2	2.8	1.0	2.8	1.14	0.234	0.791	0.4	0.2
Anxiety	2.7	1.2	2.8	1.2	2.7	1.15	0.390	0.416	0.4	0.0
Gloominess	2.5	1.2	2.7	1.0	2.7	1.09	0.090	0.949	0.4	0.2

<sup>a</sup>  $p_1$ : Friedman Ranks Test between pre-, post- and follow up-test;  $p_2$ : Wilcoxon Signed Ranks Test between post- and follow up-test;  $r$ : correlation coefficient between pre-test and follow up-test;  $d$ : effect size Cohen pre- and follow up-test. A higher score means a positive effect on all mentioned scales.

Table 4

Pre-, post-test and follow up-test results on psychosomatic symptoms and quality of life: SCL-90, VAS and WHOQUOL-brief scores (n = 122)

	Pre-test		Post-test		Follow up		p <sub>1</sub> <sup>a</sup>	p <sub>2</sub> <sup>a</sup>	r <sup>a</sup>	d <sup>a</sup>
	M	S.D.	M	S.D.	M	S.D.				
SCL-90 subscales										
Phobic anxiety	8.5	2.3	8.0	1.9	7.9	2.00	0.000	0.155	0.5	0.4
Anxiety	17.8	5.9	15.0	5.4	14.3	4.4	0.000	0.009	0.4	0.9
Depression	30.5	9.4	26.8	8.9	25.4	7.2	0.000	0.117	0.5	0.8
Somatization	21.7	6.7	19.4	6.5	18.5	6.4	0.000	0.025	0.5	0.7
Obsession-compulsion	19.1	6.5	16.1	6.0	15.3	5.0	0.000	0.037	0.6	1.1
Interpersonal sensitivity	29.5	9.2	25.8	8.7	25.3	7.4	0.000	0.527	0.6	0.8
Hostility	8.7	2.9	8.1	2.6	7.7	2.1	0.000	0.345	0.6	0.6
Sleeping problems	6.5	3.2	5.4	2.6	5.4	2.7	0.000	0.776	0.5	0.6
General Severity Index (GSI)	155.6	38.6	136.9	38.7	131.9	31.1	0.000	0.030	0.6	1.1
VAS score-severity symptoms										
Average week score	3.2	2.0	2.3	2.00	1.8	1.5	0.000	0.001	0.5	1.1
WHOQUOL-brief domains										
Physical health and independence	13.5	2.5	14.6	2.5	15.6	2.5	0.000	0.000	0.4	1.1
Mental health	12.8	2.3	14.00	2.5	14.7	2.5	0.000	0.000	0.4	1.0
Social relationships	14.1	2.4	14.7	2.6	14.8	2.5	0.005	0.951	0.4	0.3
Environment	15.9	1.6	16.4	1.8	16.7	1.6	0.000	0.033	0.6	0.7
Overall quality of life	6.8	1.4	7.2	1.3	7.6	1.3	0.000	0.001	0.4	0.8

<sup>a</sup> p<sub>1</sub>: Friedman Test; p<sub>2</sub>: Wilcoxon Signed Ranks Test between post-test and follow up-test; r: correlation coefficient between pre- and follow up-test; d: effect size Cohen pre- and follow up-test. A decrease of scores on the SCL-90 and VAS and an increase on the WHOQUOL means positive effect.

psychological factors and quality of life need more than just one short program [35]. The highest change was measured at 2 months with a little further improvement at 12 months. Most of the measures on process and outcome variables showed, as expected, significant and clinically relevant improvement at 12 months.

The total scores on self-efficacy correlated moderately with the total score on expression of emotions, and the attribution style total score had a low correlation with the other two psychological causal variables. This indicates that distinct constructs are being measured. Participants who scored a high long-term positive lasting effect on self-efficacy and attribution style, scored a significantly higher effect on the outcome variables of quality of life and psychosomatic symptoms as shown by a discriminant analysis. These are positive indications of the potential validity of the hypothesized body awareness program model.

This is confirmed by other studies where self-efficacy is stated as the most important predictor of self-management behaviors [24,25,88,89].

Participants with a low self-efficacy to start with, scored a significantly higher effect on self-efficacy in the long run. Perhaps these participants benefit more from the BAP because they have more to improve. Another explanation may be that the program has more to offer for people with low self-efficacy. The results seem to point out that by expressing emotions more, psychosomatic symptoms show less decrease. This was not expected, according to the body awareness program model, where this relationship was hypothesized in the other direction. A possible explanation for these results is the assumption that CAPS need to be clarified to the individual by means of increased body awareness. When body awareness increases, psychosomatic symptoms are better related to daily stress, and emotions are

Table 5

Discriminant analysis of high- and low-effect groups on psychological mediating variables and outcome variables (n = 122)

Mediating variables	Effect	Outcome variables (positive score means positive effect)			
		GSI score SCL-90, difference between pre-test and follow up-test		WHOQUOL-total score, difference between pre-test and follow up-test	
		Mean (S.D.)	p <sup>a</sup>	Mean (S.D.)	p <sup>a</sup>
Self-efficacy	Low (n = 60)	17.6 (30.5)	0.005	3.4 (7.3)	0.000
	High (n = 62)	29.6 (30.1)		8.7 (7.9)	
Expression of emotions	Low (n = 58)	28.8 (29.8)	0.017	6.9 (7.9)	0.232
	High (n = 64)	19.0 (31.1)		5.4 (8.2)	
Attribution style	Low (n = 64)	17.5 (29.9)	0.030	5.1 (8.5)	0.014
	High (n = 58)	30.5 (30.5)		7.3 (7.4)	

<sup>a</sup> p-value is of the Mann–Whitney test of difference in outcome variables between low- and high-effect groups on mediating variables.

more expressed. It may be that for some participants this leads to noting more symptoms at post-test questionnaires than were present at pre-test—or awareness of the symptoms may have just changed at post-test.

If a  $p$ -value is annotated as statistically significant, rejecting the null hypothesis does not imply that the effect was important, nor does a non-significant  $p$ -value indicate a clinically trivial result [90]. There were a few positive significant but not clinically relevant long-term (lasting) effects measured on self-efficacy: working without problems and influencing pain without medication (effect size  $d = 0.4$ ). The BAP was not directly oriented toward these two items of work and medication, which could explain this outcome. Also, some of the attribution style items did change significantly, but did not meet the criterion of clinical relevance: experience of failure on not able to say “no” when loaded with work, and positive experiences on rapidly being accepted at a new job and talking to a group of people. The other measured items of the attribution style questionnaire did not change at all. Perhaps the construct of attribution style is a personality factor that is mostly stable during a lifetime. When awareness grows of one’s own attribution style, it can become less stable, but the external/internal locus of control still stays the same [32,91]. On one of the subscales of expression of emotions, staying in control, there was no effect found. This might be because of the way this factor was measured; reliability and validity of this instrument and of the attribution style questionnaire in the setting of the BAP with people who suffer from CAPS, still has to be measured. On the social relationships subscale of the quality of life measurement, the difference between pre-test and follow up-test was significant but there was only a moderate effect size calculated. This means participants were not more satisfied with their personal relationships, social support and/or sexual life after the BAP. Perhaps they are content enough on these items and do not need any change? It also has to be noted that the social relationships domain makes the least contribution to the overall measurement of quality of life [78].

The subscale of phobic anxiety on the SCL-90 presented significant but not clinically relevant changes, perhaps because the content of the BAP is not therapeutically involved with reducing a symptom such as phobic anxiety. This supports the hypothesis that some specific effects are to be expected as pointed out in the body awareness program model, and the program will not produce changes in “just any thinkable variable”.

#### 4.1. Methodological reflection

In interpreting the results of this study, the following considerations are important. There was a selection bias for two reasons: participants who benefit from the program may be more likely to respond. A non-response evaluation however showed no statistical between-group differences on the measured process and outcome variables, or on

experienced program effects; respondents and non-respondents did not differ in age, gender or educational level. Secondly, participants expressed a desire to change. In terms of the stages of change theory [35], they are already in an advanced stage of readiness to change their behavior. Hence, the chances for measuring positive effects increase because participants may be more motivated than others, who are not attending the BAP, to change their behavior. However, the purpose of this study was to determine the effects of the BAP. Since BAP participants have to be motivated to change, internal validity of this study increased because the research participants were motivated. Some caution is still recommended when generalizing the results to the population of people who suffer from CAPS.

Because of the absence of a control group, which is not unusual in program evaluation, a number of measures were taken to strengthen the design. First, a program theory was specified, and hypotheses derived from this theory were measured with specific instruments. They were confirmed by the results. Second, the effects of the 47 groups all point in the same direction. This was shown in the pre- and post-test measures. Third, there was a theoretical model formulated that has some internal limitations as mentioned above. When a theoretical model is not available, one has to draw from intuition, the best practices of others and informal information sources together with social theory to attack the problem [92]. The researchers tried to extract the implicit theory of the program developers and made it as specific, measurable and potentially testable as possible in this stage of the research [93]. Stakeholder’s theory was linked to social science theory. The fact that the model was partially validated with statistical analysis, strengthens the hypothesis that the posed model comes close to a conceptual framework that can be useful in developing an effective program.

Increase of body awareness was measured by means of retrospective questions on three different dimensions. This creates a possible bias because of the demanding characteristics of such questions. Part of this problem was solved by making some questions multiple-choice and leaving it to the respondent to explain the given answers. Unfortunately there is no instrument that measures body awareness, as it is theoretically described in this manuscript, prospectively.

In conclusion, in this study the BAP was shown to produce significant and clinically relevant effects that lasted 12 months after the program in persons suffering from chronic a-specific psychosomatic symptoms. Such individuals react more adequately to disturbances of the balance between daily workload and the capacity to deal with this load. It seems that increase of self-efficacy plays a crucial role as a mediating mechanism. The negative spiral of problems and symptoms is broken through, and participants are more able to prevent chronicity and to achieve self-management in coping with stress and/or psychosomatic symptoms; this leads to increased quality of life.

## 4.2. Practical implications

This article sheds new light on the difficulties that individuals with psychosomatic symptoms and their professional interventionists encounter when attempting to manage the chronicity of the problems. By paying more attention to learning self-management by increasing body awareness and self-efficacy, patient educators may be able to increase their effectiveness. They can also help prevent chronicity when a program may start at the early stages of developing psychosomatic symptoms that have no medical explanation. Therefore, early intervention is recommended [94]. Employers and health insurance companies benefit more from early intervention, and they also benefit more from short and thus relatively cost-effective programs. In The Netherlands, work stress is clearly seen as a major health and safety issue [95]. Legislative changes in the Disability Insurance Act in The Netherlands in recent years are making both employers and employees more accountable for the health of employees. The earlier interventions are successfully implemented, the lower the costs for employers, health insurance companies and society. Therefore, research into the efficacy of programs such as the Dutch BAP is necessary, so doctors can effectively choose and refer to the most adequate program.

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