CLINICAL REPORT

Positive Changes in Self-management and Disease Severity Following Climate Therapy in People with Psoriasis

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The aim of this study was to investigate the impact of climate therapy on self-management in people with psoriasis. This was a prospective study of 254 adults with chronic psoriasis who participated in a 3-week climate therapy (CT) programme. The 8-scale Health Education Impact Questionnaire (heiQ) was completed at baseline, after 3 weeks of CT, and 3 months later. Change was assessed using paired sample *t*-tests mean (95% confidence interval) change scores (range 1–4). All heiQ scales showed statistically significant improvement after 3 weeks of CT. The greatest improvement was in Health-directed activity, followed by Emotional distress, and Skill and technique acquisition. At the 3-month follow-up, only the Emotional distress scale remained improved. In addition, disease severity (self-administered PASI; SAPASI) improved significantly from before CT to 3 weeks and 3 months after CT. This study suggests that CT provides a range of benefits that are important to people with psoriasis, particularly in the short term. A challenge is how to achieve long-term benefits. *Key words: psoriasis; climate therapy; self-management; disease severity.*

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Psoriasis affects 2–4% of the population and is probably influenced by genetic, individual and environmental factors (1). Psoriasis may be regarded as a complex long-term condition involving physical, psychological and social challenges (2), including significant impact on daily living (3), functioning and quality of life (4, 5). Psoriasis treatments aim to interrupt the immune-mediated cycle that causes increased production of epidermal cells, thereby reducing inflammation and plaque formation. Psoriasis treatment includes topical medication, ultraviolet (UV) therapy and different kinds of systemic medication. In the Nordic countries, climate therapy (CT) is a publicly funded treatment alternative, among other options for psoriasis. Every year, approximately 500 Norwegians with psoriasis attend CT on Gran Canaria in the Canary Islands, Spain. The 3-week treatment programme includes individualized scheduled sun exposure, daily physical training, education about psoriasis, comorbidity and treatments, group discussions, psychosocial support and medical consultations. CT has been shown to reduce Psoriasis Area and Severity Index (PASI) by 75% (6), *inter alia* due to the sun-induced reduction in immune activity in psoriasis lesions (7, 8). The therapy also increases the serum levels of vitamin D and reduces lipids (9). Because the CT programme includes education and support, it is reasonable to think that such a programme could also improve self-management as well as disease severity.

Self-management has emerged as a critical aspect of care for individuals with a long-term illness (10–12). The core of self-management is that people actively participate in maintaining and promoting their own health and care (10). Only a small number of studies have evaluated self-management interventions in psoriasis. De Korte et al. (13) reported that psoriasis patients participating in a disease management intervention had reduced disease severity, improved adherence to treatment regimens, and improved quality of life, and reported a high degree of satisfaction with the intervention. Pagliarello et al. (14) found that an educational intervention for psoriasis patients increased their empowerment and knowledge about the disease. Ersser et al. (15) suggested that tailored education could improve adherence and self-management. A recently published systematic literature review showed that little evidence is available to support the effects of educational and self-management interventions in patients with psoriasis. Compared with other chronic conditions, there appear to be few effective disease-specific tailored educational programmes for psoriasis (16). Hence, the aim of this study was to evaluate self-management and disease severity over a period of 4 months following CT in patients with psoriasis.

METHODS

Study design and population

The present study was a pre–post study of Norwegian adults with psoriasis who participated in CT for 3 weeks on Gran Canaria, located in the Atlantic Ocean at 28°N, 16°W. The study was conducted from April 2009 to January 2010. To be qualified for CT, the patient's PASI score must be above 7. Applications were evaluated by a dermatologist at the Section for Climate Therapy at Oslo University Hospital. Eligible patients were informed about the study after arrival at the CT centre. Seventy-four percent of the patients consented to participate. The inclusion criterion was age 20–80 years, and the exclusion criterion was concomitant use of systemic anti-psoriatic medication.

Questionnaires were administered at the start (T1), directly after 3 weeks of therapy (T2) and 3 months after T2 (T3). Data were available for 254, 251 and 207 respondents, respectively.

Ethical approval

The study was approved by the Oslo University Hospital and Norwegian Social Science Data Services, and recommended by the Regional Committee for Medical Research Ethics for Southern Norway. The study was carried out in accordance with the Declaration of Helsinki.

Climate therapy programme (CT)

Sun therapy was scheduled individually with respect to skin type and UV index (6). Patients received, a mean of 250 standard erythema doses (SED) (6). They were examined at arrival, after one week and 3 weeks. The teaching programme comprised lectures and dialogues about psoriasis pathogenesis, manifestations, comorbidity, quality of life, and treatment options. The importance of a healthy lifestyle was stressed, with focus on physical activity, stress reduction and healthy eating. Small group discussions focused on ways to manage psoriasis in daily life (Fig. 1).

The centre is administered from the University Hospital in Oslo (Section for CT). A full-time employed dermatologist, 4 nurses (with 5–30 years experience from CT), and a physiotherapist (with 15 years' experience in rehabilitation) monitored the patients and provided individual and group-based education, guidance and daily training. During the last 10 years this CT concept has been successively developed in accordance with the increased holistic comprehension of the disease. Research projects at the centre and educational methods/techniques have successively been introduced and supervised from a team of specialists at Oslo University Hospital/Oslo University and incorporated to continuously improve the programme.

Measures

Sociodemographic and clinical variables. Sociodemographic variables, such as age, sex, cohabitation, employment status, and level of formal education, were assessed. Clinical variables included the duration of psoriasis, comorbidity, previous CT, and disease severity, the latter being measured by the self-administered PASI (SAPASI) (17).

Self-management assessment: Health Education Impact Questionnaire (heiQ™). The heiQ provides a comprehensive evaluation of patient education programmes (12). It is widely used and is available in many languages (18). It was developed through extensive stakeholder engagement, including nominal group techniques, to ensure its relevance to patients, practitioners and policymakers across settings (12, 19). The heiQ comprises 40 items across 8 independent scales: Health-directed activity, Positive and active engagement in life, Self-monitoring and insight, Constructive attitudes and approaches, Skill and technique acquisition, Social integration and support, Health service navigation, and Emotional distress (a reversed scale). Table SI[1] gives a description of each scale. Each of the 8 scales has 4–7 items that are rated on a 4-point scale, where 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree. The items in each scale are summed, and the sum is divided by its number of items. Hence, the scale scores range between 1 and 4. A higher score indicates better self-management, except for the Emotional distress scale, which is reversed. Results from psychometric studies of the heiQ show satisfactory results across diverse settings (18, 20–22). The heiQ was translated and adopted into Norwegian using the guidelines of Hawkins & Osborne (23). Cronbachs' alpha for the individual scales are shown in Table SI[1].

Statistical analyses

Statistical analyses were conducted using SPSS (version 19.0). Descriptive analyses were performed to assess the frequency, mean, standard deviation (SD), and minimum and maximum scores. Cronbach's alpha was used to estimate the internal consistency of

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Aims

♦ Reduce disease severity.

♦ Increase knowledge of psoriasis and insight about coping with the disease.

♦ Increase awareness about how to reduce deteriorating risk factors, such as smoking, stress and overweight.

Content

• Examination by the dermatologist and nurse on 3 occasions (at arrival, after 1 week and 3 weeks) and follow-ups when needed (the patients have direct assess to the dermatologist and nurses during the whole treatment period).

• Tailored sun treatment (exposure according to skin type and current ultraviolet (UV)-index) and salt-water bathing.

• Physical activity
   o Mandatory 30 min of morning exercise
   o Voluntary participation in other physical activities, such as water gym, mountain walks and muscular training.

• Education in use of creams (2 h), sun treatment (1 h), nutrition (2 h) and physical activity (1 h).

• Education about psoriasis (2 h), comorbidity related to the disease (1 h), medical treatment (2 h) and research (1 h).

• 2–3 group meetings, focusing on experiences in living with psoriasis, coping with stress, nutrition in daily life, self-care and smoke cessation (4–6 h).

• Interaction with others with similar health challenges in formal and informal settings and individual counseling when needed.

Fig. 1. Aim and content of climate therapy programme.

the scale (reliability). Paired-sampled *t*-tests were used to evaluate the changes from baseline to follow-up, and 95% confidence intervals (CIs) were calculated. A small amount of missing data was identified across the heiQ scales. Data from individuals with ≥10% missing data were eliminated. The questionnaire data from individuals with <10% of missing data were replaced using the SPSS EM procedure (IBM Cons., New York, NY).

RESULTS

Characteristics of the sample

The mean (SD) age of the respondents was 47 (12) years (range 20–80 years). One hundred and two (40%) were women, and 153 (60%) had 12 years of education; 70 (28%) reported living alone. The mean (SD) disease duration was 24 (13) years (range 1–60 years). The mean (SD) pre-treatment disease severity (SAPASI) score was 8.6 (6.2), and 111 (44%) reported comorbidity (see Table SII[1]).

Changes in SAPASI scores

The disease severity (SAPASI score) improved significantly, from 8.6 (95% CI: 7.7–9.4) at T1 to 1.6 (1.2–2.1) at T2 ($p < 0.001$). At T3 the SAPASI score was 6.4 (5.7–7.2), which is also a significant improvement compared with T1 ($p < 0.001$).

Changes in heiQ scales

There was significant improvement in all heiQ scales from baseline (T1) to immediately after CT (T2) ($p < 0.001$) (see Table I). The largest mean (95% CI) improvements were for Health-directed activity 0.32 (0.25–0.40), followed by Emotional distress –0.22 (–0.30 to –0.16) and Skill and technique acquisition 0.22 (0.16–0.27).

Three months after CT (T3), the Emotional distress scale was the only scale which showed significant improvement compared with baseline (T1) mean change (95% CI) –0.11 (–0.19 to –0.03). In the scales Health service navigation and Positive and active engagement in life the mean scores were significantly worse compared with the baseline scores (T1). For further information on changes, see Table I.

DISCUSSION

This study shows that self-management improved significantly from before to immediately after CT. The greatest improvements were seen in Health-directed activity, followed by Emotional distress and Skill and technique acquisition. However, after 3 months,

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[1] http://www.medicaljournals.se/acta/content/?doi=10.2340/00015555-1939

Table I. *Self-management outcomes for people with psoriasis*

heiQ scales	Baseline to 3-week follow-up (n = 251)					Baseline to 3-month follow-up (n = 207)				
	Baseline[a]	Follow-up[a]	Change from baseline	95% CI of mean change	p-value	Baseline[a]	Follow-up[a]	Change from baseline	95 % CI of mean change	p-value
1. Positive & active engagement in life	3.23	3.36	0.13	0.08–0.17	<0.001	3.24	3.16	–0.08	–0.14 to –0.03	0.002
2. Health-directed activity	2.96	3.28	0.32	0.25–0.40	<0.001	3.02	3.00	–0.02	–0.09–0.06	0.72
3. Skill and technique acquisition	2.78	3.00	0.22	0.16–0.27	<0.001	2.80	2.87	0.07	0.00–0.14	0.06
4. Constructive attitudes and approaches	3.15	3.29	0.14	0.09–0.19	<0.001	3.18	3.13	–0.05	–0.11–0.01	0.16
5. Self-monitoring and insight	3.04	3.17	0.13	0.09–0.18	<0.001	3.06	3.07	0.01	–0.04–0.07	0.56
6. Health service navigation	3.04	3.14	0.10	0.03–0.14	<0.001	3.06	2.96	–0.10	–0.16 to –0.04	0.001
7. Social integration and support	2.94	3.09	0.15	0.09–0.21	0.001	2.97	2.92	–0.05	–0.12–0.02	0.15
8. Emotional distress[b]	2.22	2.00	–0.22	–0.30 to –0.16	<0.001	2.21	2.10	–0.11	–0.19 to –0.03	0.004

[a]Mean values. [b]Reversed scale (low=good).

only Emotional distress and disease severity remained significantly improved compared with the baseline score. Hence, long-lasting changes in self-management in relation to CT may be questioned. Similar positive short-term results with regard to improved quality of life have previously been reported (24). Returning to everyday life after CT may be associated with reduced access to healthcare professionals and lack of support from peers compared with those received during the CT programme. Post-CT booster interventions at home may be an option to prolong the positive changes following CT.

With regard to self-management the largest improvement were observed for Health-directed activity and Skill and technique acquisition, especially immediately after the intervention. In addition to sun exposure, the CT programme includes health education, physical activity, and a healthy diet (see Fig. 1). Accordingly, the improvements in Health-directed activity and Skill and technique acquisition are consistent with the content of the intervention. In a recent study of the present sample, psoriasis-related knowledge was measured using the Psoriasis Knowledge Questionnaire, and significant short- and long-term improvements were noted (25). It is known that health-related knowledge is important (26), although not sufficient by itself to provide motivation to change to a healthier lifestyle pattern (27, 28). Thus, it is important to understand how to translate this knowledge into promoting health in everyday life.

Emotional distress was the only self-management scale that remained improved 3 months after CT. Psychological distress (29, 30), higher levels of anxiety, depression, worry and suicide ideation have been reported as common problems in people with psoriasis compared with controls (31). The different components of the CT programme, such as the relaxing environment, support from other patients and healthcare personnel, may have contributed to an immediate positive outlook on life, which in turn, may have influenced the patients' perceptions of emotional well-being. Furthermore, reduced disease severity and symptom burden (e.g. skin discomfort, itch and pain) following CT certainly may play a major role in reducing the level of emotional distress.

One may raise the question whether all of the self-management areas reflected in the heiQ scales are equally important and relevant for measuring outcomes of CT, since the CT programme is closely linked to reduction in disease severity, and to increase knowledge and insight specific to psoriasis. Hence, the focus on heiQ scales, such as Self-monitoring and insight, Skill and technique acquisition and Health-directed activity seem specifically important.

Self-assessed disease severity, measured by SAPASI, was significantly improved both immediately after CT and 3 months after, compared with before CT. The im-mediate improvement in disease severity after CT has been shown in several previous studies (e.g. 6). Although the improvement was reduced at 3 months after CT, it was still significant. The reason for the prolonged effect may be that more effort has been made to include systematic health education during CT, which in turn may have increased knowledge and insight regarding the importance of adherence to treatment.

Although the results of this study seem promising, the absence of a control group means that full attribution of improvements after CT is not possible, because we cannot exclude a range of biases (32, 33). Further research should use a stronger study design, such as controlled trial to strengthen the evidence for both the short- and long-term effects of CT on outcomes, such as self-management. The implementation of such controlled trials is a challenge in settings where an intervention has become integrated into routine practice. This is the first study reporting data on the Norwegian version of the heiQ. The translation and adaptation procedure followed well-established principles for cross-culture translation and adaption of questionnaires. The results from our study may indicate good internal consistency, with alpha range from 0.7 to 0.9 across the heiQ scales, and responsiveness in the context of CT and psoriasis.

Conclusion

This study suggests that CT provides a range of benefits that are important to people with psoriasis, particularly in the short term. However, one may question how to achieve long-term benefits. Implementation and evaluation of post-CT self-management interventions may expand our understanding of its effectiveness. With regard to the practical implications, this study highlights the importance of considering the content of the self-management intervention and in which domains CT should generate benefits. Alongside this, further work is required to ensure self-management interventions seeking to maximize benefits over the long term.

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Table SI. *Key words and descriptions of the 8 heiQ scales*

1.   Health-directed activity (alpha 0.83)
     This domain includes the level of functional activity in lifestyle by either disease prevention and/or health promotion.

2.   Positive and active engagement in life (alpha 0.77)
     This domain covers motivation to be active and getting involved in life. It includes both behavioural elements, such as participation in life activities and psychological elements, such as enthusiasm for life activities.

3.   Self-monitoring and insight (alpha 0.70)
     This domain focuses on the level of insight into living with a health problem. It captures how an individual engages in self-monitoring of their health problems. It includes the individuals' acknowledgement of realistic illness-related limitations and the ability and confidence to adhere to these limitations.

4.   Constructive attitudes and approaches (alpha 0.83)
     This domain is based in the attitude that the person is not going to let the health problems control their life and includes a shift in how individuals' view the impact of their condition on their life.

5.   Skill and technique acquisition (alpha 0.76)
     This domain includes an improvement in knowledge-based skills and techniques to manage own health

6.   Social integration and support (alpha 0.79)
     This domain captures the positive impact of social engagement and support that evolves through interaction with others. It also includes the confidence to seek support from interpersonal relationships as well as from community-based organizations.

7.   Health service navigation (alpha 0.75)
     This domain focuses on an individual's understanding of and ability to confidently interact with health professionals and organizations. In addition it focus on the understanding of ways to access healthcare and negotiate with healthcare providers to get needs met.

8.   Emotional distress (alpha 0.90)
     This domain measures negative affect, such as anxiety, stress, anger and depression.

Table SII. *Demographic and clinical characteristics of the group at baseline (*n = 254*)*

Characteristics	
Sex, *n* (%)	
Male	152 (60)
Female	102 (40)
Age, years, mean (SD) [range]	47 (12) [20–80]
Living alone, *n* (%)	
Yes	70 (28)
No	184 (72)
Employed, *n* (%)	
Yes	174 (69)
No	80 (31)
Education, *n* (%)	
Primary school: ≤12 years	153 (60)
University or college: ≤4 years	52 (21)
University or college: >4 years	49 (19)
Previous climate therapy, *n* (%)	
Yes	140 (55)
No	114 (45)
PASI, mean (SD) [range]	7.5 (4.1) [0.4–26.1]
Years with psoriasis, mean (SD) [range]	24 (13) [1–60]
Comorbidity, *n* (%)	
Yes	111 (44)
No	143 (56)

PASI: Psoriasis Area and Severity Index; SD: standard deviation.