



Review

Mind-Body Interventions as Alternative and Complementary Therapies for Psoriasis: A Systematic Review of the English Literature

Teodora Larisa Timis ¹, Ioan Alexandru Florian ^{2,*}, Daniela Rodica Mitrea ¹ and Remus Orasan ¹

¹ Department of Physiology, “Iuliu Hatieganu” University of Medicine and Pharmacy, 400012 Cluj-Napoca, Romania; doratimis@gmail.com (T.L.T.); rdmitrea@yahoo.co.uk (D.R.M.); rorasan@yahoo.com (R.O.)

² Department of Neurosciences, “Iuliu Hatieganu” University of Medicine and Pharmacy, 400012 Cluj-Napoca, Romania

* Correspondence: florian.ioan.alexandru@gmail.com

Abstract: Objective: Conventional therapeutic methods for psoriasis include topical and systemic drugs, phototherapy, and biologic agents. Despite the fact that these treatment methods, and especially biologic agents, are met with a considerable reduction in disease activity, they can sometimes be costly and are nonetheless accompanied by high risks of adverse events, ranging from mild to debilitating. Therefore, complementary and alternative medicine (CAM), especially mind-and-body interventions, such as acupuncture, psychotherapy, climatotherapy, and cupping may provide a cheaper and potentially beneficial outcome for these patients. Methods: We performed a systematic review of articles pertaining to acupuncture, cupping, psychotherapy and meditation, as well climatotherapy and balneotherapy in the management of psoriasis, by using the PubMed, Medline and Google Academic research databases and reference cross-checking. Results: 12 articles on acupuncture, 9 on dry or wet cupping, 27 concerning meditation, hypnosis or psychotherapy, and 34 regarding climate therapy or balneotherapy were found. Discussion and Conclusions: Currently, there is a lack of evidence in the English literature to support acupuncture as an effective alternative therapy for psoriasis, whereas cupping has been described in the majority of instances to result in Koebner phenomenon and clinical worsening. Stress management therapies such as psychotherapy, hypnosis, and meditation have shown promising results as complementary treatment methods. Climatotherapy and balneotherapy have already been proven as effective means of achieving clinical improvement in psoriasis. Further research is still needed to verify the usefulness of the lesser studied treatment methods.

Keywords: psoriasis; complementary and alternative medicine (CAM); acupuncture; balneotherapy; climatotherapy; cupping therapy; psychotherapy



Citation: Timis, T.L.; Florian, I.A.; Mitrea, D.R.; Orasan, R. Mind-Body Interventions as Alternative and Complementary Therapies for Psoriasis: A Systematic Review of the English Literature. *Medicina* **2021**, *57*, 410. <https://doi.org/10.3390/medicina57050410>

Academic Editor: Adam Reich

Received: 24 March 2021

Accepted: 22 April 2021

Published: 23 April 2021

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

Psoriasis is a chronic inflammatory disorder that possesses decisive immunological and genetic elements, upon which several environmental factors may act, triggering the pathological cascade. Although it initially involves the skin, psoriasis leads to a substantial systemic impact, as well as a heavy psychological burden in many cases [1]. According to current data, it affects approximately 1–3% of the world population, presenting a first incidence peak between 15 and 20 years of age, followed by a secondary peak at 55 to 60 years [2]. In order to evaluate disease severity, various scores, such as the PASI (Psoriasis Area and Severity Index), or PGA × BSA (Physician Global Assessment and Body Surface Area) have been implemented, whereas the quality of life can be evaluated by the DLQI (Dermatology Life Quality Index) [3–5]. Presently, the PASI score is utilized for both the initial clinical evaluation of patients, and for their response to therapy. Although,

until recently, PASI responses of 50 or 75 (denoting a 50% or 75% reduction in disease severity, respectively) were the primary aims for treatment, current methods strive for PASI 100, meaning a complete remission of cutaneous lesions [6–8]. These therapies include topically applied drugs such as dithranol, salicylic acid, corticosteroids, vitamin D analogues, or calcineurin inhibitors; phototherapy typically using either ultraviolet B (UVB), or a combination between psoralen and ultraviolet A (PUVA); systemic non-biologic therapies such as methotrexate (MTX), cyclosporin A, acitretin, apremilast, 6-thioguanine, or tofacitinib; and biologic agents that interfere with the pathological cascade of psoriasis near its outstart, these being TNF- α inhibitors (Adalimumab, Etanercept, Certolizumab, and Infliximab), the IL-12/23 inhibitor Ustekinumab, specific IL-23 inhibitors (Guselkumab, Risankizumab, and Tildrakizumab), and the IL-17 inhibitors (Brodalumab, Ixekizumab, and Secukinumab) [6–10]. The majority of modern therapies, whether focal, systemic or biologic, have a desired response of PASI 90 or 100, and are supported by a large volume of data as being regularly effective in ameliorating psoriasis. We, as practitioners, should always be informed and aware of recent developments, so that our selected treatment modality is optimal for each patient.

As conventional therapies are not always efficient in psoriasis, are high cost, and are sometimes associated with undesirable side effects, complementary and alternative medicine (CAM) may offer a safe and generally inexpensive substitute for some patients. Complementary medicine blends these approaches with conventional treatment, while alternative medicine is utilized instead of mainstream therapies. These are split into two groups: mind–body interventions (acupuncture, cupping, and meditation) and natural products, incorporating herbs, vitamins, and dietary supplements [11,12]. It is estimated that more than half of the patients with psoriasis seek CAM because of their dissatisfaction with the effects of conventional treatment methods [11–13], despite the fact that, until recently, CAM has been regarded as a non-evidence-based practice [13]. Hereafter, we present a systematic review of the studies on mind and body interventions performed for psoriasis that are available in the English literature.

2. Methods

We have performed a thorough search of the PubMed, Medline, and Google Academic databases for articles pertaining to mind-and-body interventions as CAM in psoriasis. No timeframe filters were utilized. For acupuncture and its related interventions, we used the keywords “acupuncture”, “moxibustion”, “needling”, “acupoint”, “puncture”, and “electrostimulation”. Regarding cupping therapy, the terms “cupping”, “moving cupping”, “dry cupping”, “wet cupping”, “Hijama”, or “Hijamah” were used. The keywords “psychotherapy”, “hypnosis”, “psychological support”, “support group”, and “meditation” were employed when searching for studies concerning stress management therapies. Lastly, the terms “balneotherapy”, “climatotherapy”, “climate therapy”, “Dead Sea”, or “Thalassotherapy” were employed for researching climate therapy articles. In conjunction with the aforementioned terms, “Psoriasis” was also used as a keyword for each individual search. Only articles with full text in English were considered. Furthermore, we only included studies performed on human subjects, regardless of prospective or retrospective nature, randomization, or number of participants (case reports were also encompassed). After full-text evaluation, additional references were verified and additional studies that did not appear at initial screening were included. Reviews and meta-analyses were excepted from the study itself, however they were employed for cross-reference checking.

3. Results

3.1. Data Acquisition

After the initial search and title screening, we obtained a total of 90 articles regarding acupuncture, 58 referring to cupping therapy, 146 pertaining to meditation and psychotherapy, and 298 related to climatotherapy. Subsequently, after eliminating duplicates, performing abstract screening and cross-reference checking, the total number of articles

was reduced to 36, 15, 38, and 42 for each respective category. Full-text screening led to the removal of a further 24 acupuncture articles, which were animal studies, protocols for systematic reviews and prospective studies, systematic and non-systematic reviews, aside from articles written in Chinese or Korean that only had the abstract in English. Six cupping therapy articles which were written in Chinese and were reviews or opinions were also excluded. Review articles on psychotherapy, meditation and hypnosis, as well as studies on different dermatological diseases concerning these treatment methods or studies simply evaluating stress levels for psoriasis patients without any interventions were removed, these being 11 in number. Finally, eight articles on climate therapy, that addressed other dermatological ailments, were both systematic reviews or otherwise, or that simply evaluated epidemiological tendencies without outcomes, were discarded. The flowchart in Figure 1 summarizes the study inclusion/elimination process for each of the four treatment methods.

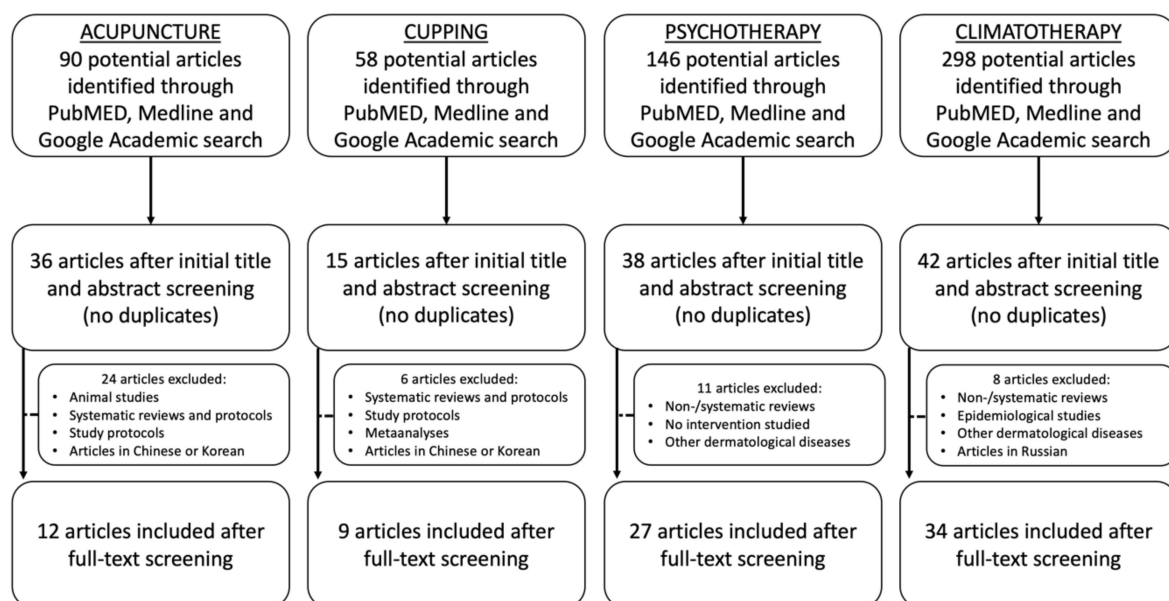


Figure 1. Analytical flow-chart of the employed article selection and elimination processes.

Regarding the articles on acupuncture and its analogous therapies, three were randomized controlled trials (RCTs), two were retrospective reports on non-randomized patients, one was a prospective observational report, and six were case reports of either one (four articles) or two (one article) patients. Excluding two articles, of which one was a prospective cohort of patients with various dermatoses, including psoriasis undergoing wet cupping [14], and the other a retrospective report of individuals who reported with secondary lesions after cupping [15], the remaining seven articles we obtained on cupping therapy were single-patient case reports. Fifteen articles on stress-reducing interventions were RCTs (one of which opted for a patient-preference randomization [16]); one was a non-randomized prospective trial, and one was a prospective cohort, whereas the remaining ten were case reports. As for climatotherapy and balneotherapy, we identified 6 prospective RCTs and 7 non-randomized trials, 12 single-arm prospective studies, and 7 retrospective studies (out of which 3 were comparative), one open, uncontrolled prospective trial [17], and one multicenter controlled cross-sectional study [18].

3.2. Patient Populations

In total, we identified 429 patients experiencing acupuncture for psoriasis; 254 males and 175 females. The average age was 42.43 years, the oldest patient recorded was 84 years, and the youngest was only 9 years [19,20]. The treatment periods lasted from 1 to

14 months, while the disease itself had a variable duration, from 4 to 20 years. A summary of patient characteristics can be viewed in Table 1.

Within the studies included, all 31 psoriasis patients treated via cupping were male. Ages ranged from 17 to 67 years, with an average of 36.14 years based on the ages provided. Duration of symptoms ranged from as little as 2 weeks to 10 years, while cupping treatment length varied from 5 days to up to 3 weeks. Table 2 presents a brief description of collected patients undergoing cupping therapy for psoriasis.

Adding together all the patients undergoing stress management therapies and psychological support, we obtained a total of 1085 individuals, of which 492 were female and 455 were male, based on the data provided. Patient age averaged at 43.78 years. Disease length at the time of treatment initiation had the largest range of all procedures analyzed, from the very day of symptom onset [21] to 64 years [16]. Duration of treatment also varied widely, from 6 weeks to as long as 4 years, depending on the exact procedure. More elaborate patient population details are presented in Table 3.

A total of 8498 patients suffering from psoriasis were enrolled in the studies of climate therapy and balneotherapy (9236 including control patients without psoriasis), and according to available and specified data, these numbers included 4702 males and 3675 females. The average age of patients undergoing these therapies across all studies was 48.02 years. Although no data was obtained regarding length of the disease, they varied from one to 60 years, the most common values being centered around 20–30 years. Treatment length was most commonly 3–4 weeks, although some balneotherapy interventions took 6 or 8 weeks [22–24], whereas some patients under climatotherapy followed this treatment for as little as 6 days [25]. It is worth mentioning that the study of Langeland and that by Wahl employed the same patient population based on their characteristics [26,27]. As such, this population was only considered once when performing calculations. Table 4 depicts the patient populations that have experienced balneotherapy and climate therapy.

Table 1. Trials and case reports of patients undergoing acupuncture and similar therapies for psoriasis (arranged in order of references).

Author, Year	Procedure	Study Design	Study/Treatment Length	Patients Included	Gender	Mean Age (y)	Average Duration of Psoriasis	Comparison Therapy	Dropout No. (%)	Severity Measurement	Outcome
Liao and Liao, 1992 [19]	Acupuncture	Retrospective report	9.1 sessions (average)	61 Therapy	25M/36F	51.84	16.26 y	N/A	N/A	Arbitrary, visual	On average, moderate improvement was achieved in psoriasis patients. However, no standard evaluation score was provided for accurate comparison.
Ye et al., 2004 [20]	Acupuncture plus Chinese herbs	Retrospective report	8 y study (30–50 days courses)	80 Therapy	44M/36F	9–65	NS	N/A	N/A		Therapy effectiveness of 91.3% (41 cured, 18 markedly improved, 14 improved).
Jerner et al., 1997 [28]	Electrostimulation via intramuscular acupuncture and ear acupuncture	Prospective RCT	10 w	54: 35 Therapy 19 Placebo	31M/23F	44 // 48	20 y // 20 y	sham (minimal) acupuncture	2 (3.5%)	PASI	PASI lowered from 9.6 to 8.3 in the therapy group and from 9.2 to 6.9 in the placebo group, w/o statistically significant differences between the two.
Pan et al., 2018 [29]	Fire-needle therapy plus HXJDD and Vaseline cream	Prospective RCT	4 w	136: 68 Therapy 68 Control	89M/47F	44.92 // 45.19	13.72 y // 13.41 y	HXJDD and Vaseline cream alone	15 (10%)	PASI, DLQI, HAMA, CM syndrome score	Therapy group did not attain significant improvement in PASI score compared to control group. However, significant differences were found between the two groups in alleviating CM syndrome and DLQI.
Lu et al., 2012 [30]	Auricular therapy with optimized Yinxieling Formula	Prospective single-blind RCT	8 w	84: 43 Therapy 41 Control	61M/23F	38.98 // 38.58	118.63 mo (9.9 y) // 136.79 mo (11.4 y)	optimized Yinxieling Formula alone	N/A	PASI, DLQI, VAS, SDS, SAS	PASI lowered in both, yet significantly more in the therapy group. DLQI decreased in both groups, though not statistically significant and w/o statistical significance in difference between the two. SAS, SDS, VAS showed no statistical difference

Table 1. Cont.

Author, Year	Procedure	Study Design	Study/Treatment Length	Patients Included	Gender	Mean Age (y)	Average Duration of Psoriasis	Comparison Therapy	Dropout No. (%)	Severity Measurement	Outcome
Jorge et al., 2016 [31]	Ear acupuncture	Prospective observational report	14 w or symptom resolution	7	2M/5F	33	11.7 y	N/A	3 (30%)	PASI	5 of 7 patients presented complete disappearance of symptoms, two had significant recovery.
Jeon YC, 2016 [32]	Traditional Korean Medicine, especially Sa-Am acupuncture plus Chinese herbs	Case report	14 mo therapy	1	F	25	3 y	N/A	N/A	NS	The lesions on the patient's back, abdomen right inner thigh, left foot, left side of the scalp had disappeared.
Lee et al., 2019 [33]	Traditional Korean medicine (acupuncture, herbal medicine, probiotics) and phototherapy	Case report	5 mo (case 1), 8 mo (case 2)	2	1M/1F	37/33	4 y // 7 y	N/A	N/A	PASI, VAS	PASI decreased from 7 to 1.2 (Case 1), and 23.2 to 2.2 (Case 2).
Mahovic and Mrcsic, 2016 [34]	Acupuncture	Case report	1 mo	1	F	49	20 y	N/A	N/A	Arbitrary, visual	Improvement of clinical aspect of psoriatic lesions.
Zhu et al., 2011 [35]	Needle acupuncture	Case report	1 mo	1	F	32	10 y	N/A	N/A	NS	Acupuncture induced Koebner phenomenon.
Wu et al., 2013 [36]	Acupuncture (for back pain)	Case report	Not reported	1	M	73	20 y	N/A	N/A	NS	Acupuncture induced Koebner phenomenon.
Zhu et al., 2017 [37]	Acupuncture	Case report	5 mo	1	F	43	20 y	N/A	N/A	Arbitrary, visual	Improvement of clinical aspect of psoriatic lesions.

Abbreviations (in alphabetical order): CM, Chinese Medicine; DLQI, dermatology life quality index; F, female; GAD-7, 7-item Generalized Anxiety Scale; HAMA, Hamilton Anxiety Rating Scale; HXJDD, Huoxue Jiedu Decoction; M, male; mo, months; N/A, not applicable; NS, not specified; PASI, psoriasis area and severity index; RCT, randomized controlled trial; SAS, self-rating anxiety scale; SDS, self-rating depression scale; VAS, visual analogue scale; w, weeks; w/o, without y, years.

Table 2. Clinical studies on patients undergoing dry and wet cupping therapy for psoriasis (arranged in order of references).

Author	Year	Procedure	Study Design	Study/Treatment Length	Patients Included	Gender	Age (y)	Average Duration of Disease	Outcome
El-Domyati et al., 2013 [14]	2013	Wet cupping	Prospective single-arm cohort	4–6 sessions (2–4 w between sessions)	50 (8 with psoriasis)	M	Range 17–67	NS	No improvement was demonstrated in the psoriasis group and Koebner phenomenon appeared on 3 of the patients' sites of cupping and incisions (upper and lower back).
Sharquie et al., 2019 [15]	2019	Wet cupping	Retrospective report	2 w	24 (16 with psoriasis)	M	Range 25–40 (mean 32.5 for all cases)	NS	Koebner phenomenon appeared on the patients' sites of cupping and incisions (back).
Pavlov and Dimitrova, 2019 [38]	2019	Bloodletting and cupping	Case report	NS	1	M	26	3 mo	Koebner phenomenon appeared on the upper and lower back, at the site of cupping (paravertebral).
Malik et al., 2015 [39]	2015	Wet cupping	Case report	3 w	1	M	30	3 y	PASI was initially 2, and 90% of lesions had disappeared after 3 sessions.
Polat Ekinçi and Pehlivan, 2000 [40]	2020	Wet cupping	Case report	1 w	1	M	39	8 mo	Koebner phenomenon appeared on the patient's back at the site of the incisions and cupping (upper and lower back).
Suh et al., 2016 [41]	2016	Dry cupping	Case report	NS	1	M	38	3 y	Koebner phenomenon appeared on the patients' sites of cupping and incisions (back and buttocks) and aggravated psoriatic lesions on which cupping was performed.
Tang L et al., 2021 [42]	2021	Dry cupping	Case report	2 w	1	M	35	2 w	Koebner phenomenon appeared at the cupping area.
Vender and Vender, 2015 [43]	2015	Dry cupping	Case report	2 w	1	M	45	4 mo	Koebner phenomenon appeared on the patient's lower back at the sites of cupping.

Table 2. Cont.

Author	Year	Procedure	Study Design	Study/Treatment Length	Patients Included	Gender	Age (y)	Average Duration of Disease	Outcome
Yu et al, 2013 [44]	2013	Dry cupping	Case report	5 d	1	M	40	10 y	Koebner phenomenon appeared on the patient’s back, chest and abdomen, at the site of cupping.

Abbreviations (in alphabetical order): d, days; M, male; mo, months; NS, not specified; w, weeks; y, years.

Table 3. Trials and case reports of patients following psychotherapy, stress management, hypnosis, and meditation for psoriasis (arranged in order of references).

Author	Procedure	Study Design	Study/Treatment Length	Patients Included	Gender	Age (y)	Mean Duration of Disease	Comparison Therapy	Severity Measurement	Outcome
Fortune et al., 2004 [16]	Psoriasis symptom management program	Patient-preference randomized controlled trial	6 w	93: 40 Therapy 53 Control	31M/62F	25.2 // 20.2	18.5 y // 22.5 y (Range 3–64 y)	Standard pharmacological care only	PASI	Significant difference on depression, anxiety, psoriasis life stress beliefs in severity of consequences of psoriasis, no/freq. of symptoms after therapy and follow-up.
Abel et al., 1990 [21]	Support group therapy	Case report	several w/1 mo	2	F	62/56	1 d/25 y	N/A	Visual aspect of lesions	Improvement in clinical condition for both patients.
Price et al., 1990 [45]	Psychotherapy	RCT, pilot	8 w	23: 11 Therapy 12 Control	12M/11F	42.8/46	17 y/25 y	Control	VAS, HADS	Visible clinical improvement in within the active group. However, the VAS is a rather inaccurate measure of psoriasis, and this portion of the trial was handled in an open fashion.
Schmid-Ott, 2000 [46]	Psychotherapy	Case report	2 y	1	F	48	46 y	N/A	NS	Improvement at the end of and 2.5 y after therapy.
Shah and Bewly, 2014 [47]	Psychological intervention	Case report	7 m	1	F	46	40 y	N/A	PASI	Improvement of psoriasis (baseline PASI of 24.8, then 0.6 after therapy).

Table 3. Cont.

Author	Procedure	Study Design	Study/Treatment Length	Patients Included	Gender	Age (y)	Mean Duration of Disease	Comparison Therapy	Severity Measurement	Outcome
Shafii and Shafii, 1979 [48]	Psychodynamic psychotherapy	Case report	NS	1	M	NS	NS	N/A	NS	Improvement of lesions and recovery of symptoms after psychotherapy.
Tengattini et al., 2019 [49]	Psychological intervention	Prospective, non-randomized trial	6 mo	86: 33 Therapy 53 Control	NS	>18	NS	Standard care	PASI, BSA, PSAB, GAD-7, DLQI, SF-12	A statistically significant improvement in PASI and BSA was noticed in both groups at 6 months.
Zachariae et al., 1996 [50]	Psychotherapy (individual sessions)	Prospective RCT	12 w	44: 23 Therapy 21 Control	18M/26F	38.7 // 39.5	NS	Control (no psychological or medical treatment)	PASI, TSS, LDBF	Slight but significant changes in TSS and LDBF in the therapy group, yet not in the control group. No differences between groups concerning PASI. The therapy group displayed significant reductions for all three psoriasis severity measures, w/o changes in the control group.
Kabat-Zinn et al., 1998 [51]	Mindfulness meditation-based stress reduction intervention plus UVB and PUVA	Prospective RCT	13 w	37: 8 Therapy 1 10 Therapy 2 8 Control 1 11 Control 2	17M/20F	43	11.2 y	UVB and PUVA alone (no audiotapes)	Measure designed for this study	Statistically significant difference between tape and no-tape groups, attainment rate being approx. 3.8-times more likely in the former at halfway and clearing points.
Frankel and Misch, 1973 [52]	Hypnosis, psychotherapy	Case report	4 y	1	M	37	20 y	N/A	NS	Improvement of psoriatic lesions.
Kline et al, 1954 [53]	Hypnosis	Case report	11 w	1	F	45	20 y	N/A	Surface area and visual aspect	Improvement of psoriatic lesions.
Waxman, 1973 [54]	Hypnosis	Case report	NS	1	F	38	20 y	N/A	NS	Improvement of skin condition (score not mentioned).

Table 3. Cont.

Author	Procedure	Study Design	Study/Treatment Length	Patients Included	Gender	Age (y)	Mean Duration of Disease	Comparison Therapy	Severity Measurement	Outcome
Tausk and Whitmore, 1999 [55]	Hypnosis with active suggestions of improvement	Prospective RCT, single blind	3 mo	11: 5 Therapy 6 Control	NS	NS	>6 mo	Neutral hypnosis with no mention of their disease process	PASI, VAS, Stanford Hypnotizability scale	In the therapy group, the 3 highly hypnotizable patients had 81%, 43%, and 8% reductions in PASI at 3 mo. The 2 highly hypnotizable subjects in control had 31% and 18% amendment in PASI, whereas 2 of the moderately hypnotizable patients showed 13% and 22%, and 2 had a worsening of 36% and 18%, correspondingly.
Gaston et al., 1991 [56]	Meditation (T1)/meditation and imagery (T2)	Prospective RCT	12 w	18: 5 Therapy 1 4 Therapy 2 5 Control 1 4 Control 2	5M/13F	34.3	13.7 y	waiting list (C1)/no treatment (C2)	4-item scale by Lowe et al	Significant difference between therapy and control groups regarding mean psoriasis ratings after period, w/o any additional impact from imagery.
Lazaroff and Shimshoni., 2000 [57]	Medical Resonance Therapy Music plus normal therapy	Prospective RCT	14 d	30: 20 Therapy 10 Control	13M/17 F	Range 18–60	NS	Normal therapy	Stimulus to scratch and the degree of sickness	Stimulus to scratch and degree of sickness were more reduced in therapy group (significance not specified).
Paradisi et al., 2010 [58]	Written emotional disclosure interventions and UVB	Prospective RCT	4 mo	40	NS			UVB alone	PASI, SAPASI, Skindex-29, DHQ-12	Significant differences in Skindex-29 values between emotional writing group and others. Additionally, patients allocated to emotional writing had a longer period of remission after phototherapy.
Vedhara et al., 2006 [59]	Written emotional disclosure intervention	Prospective RCT	12 w	59: 31 Therapy 28 Control	32M/27F	50	22 y	Control writing intervention	PASI, HADS, DLQI, POMS	Disease severity and quality of life improved in both groups at the follow-up, w/o significant difference between therapy and control patients.

Table 3. Cont.

Author	Procedure	Study Design	Study/Treatment Length	Patients Included	Gender	Age (y)	Mean Duration of Disease	Comparison Therapy	Severity Measurement	Outcome
Tabolli et al., 2012 [60]	Pennebaker’s writing emotional disclosure plus educational intervention	Prospective RCT	2 y	202: 97 Therapy 102 Control	124M/78	47.94	approx. 18 y	Educational intervention alone	PASI, SAPASI, Skindex-29, GHQ-12	No significant differences in clinical or QoL between groups. Slight or no effect on the variables of interest by therapy.
Fordham et al., 2014 [61]	MBCT plus standard care	Prospective RCT	8 w	29: 13 Therapy 16 Control	13M/16F	41.17	21.21 y	Standard care	SAPASI, DLQI, HADS, PSS-10	Those in the MBCT group had a significant improvement concerning symptoms and QoL (DLQI) when compared to control cases.
D’Alton et al., 2018 [62]	MBCT (T1), MBSCT (T2), and MBSCT-SH (T3)	Prospective RCT	8 w	94: 25 Therapy 1 25 Therapy 2 22 Therapy 3 22 Control	42M/52F	49.89	24.25 y	Standard care	PASI, DLQI, WHOQOL-BREF	No significant differences on psychological well-being, psoriasis symptom burden, or quality of life compared to TAU at post-treatment, 6- or 12-mo follow-up.
van Beugen et al., 2016 [63]	ICBT and standard care	Prospective RCT	6 mo	131: 65 Therapy 66 Control	67M/64F	52.69 // 53.45	18.03 y // 15.16 y	Standard care	PASI, SAPASI, ISDL, RAND-36	Larger improvements in ICBT compared to CAU regarding physical functioning and impact on daily activities, though not in psychological functioning, at 6-mo follow-up.
Spillekom-Van Koulil, 2018 [64]	ICBT	Case report	5 mo/6 mo	2	1M/1F	64/26	28 y/1 y	N/A	NS	Improved physical and psychological wellbeing, sustained at 6-mo follow-up.
Bundy et al., 2013 [65]	eTIPs—CBT	Prospective RCT	6 w	126: 61 Therapy 65 Control	59M/67F	45	>16 y	usual care	PASI, HADS, DLQI	No significant difference in PASI scores after intervention. Results may be limited by the large quantity of unavailable data.
Seng and Nee, 1997 [66]	Support group therapy	Prospective single-arm cohort	7 w	10	6M/4F	37.5	15 y	N/A	Knowledge, acceptance and coping with the disease	Patients felt that the program enhanced their knowledge of psoriasis and increased their confidence in coping with the disease.

Table 3. Cont.

Author	Procedure	Study Design	Study/Treatment Length	Patients Included	Gender	Age (y)	Mean Duration of Disease	Comparison Therapy	Severity Measurement	Outcome
Piaserico et al., 2016 [67]	Biofeedback and CBT plus UVB	Prospective RCT	8 w	40: 20 Therapy 20 Control	12M/28F	49.7	17.7 y	UVB alone	PASI, GHQ-12, Skindex-29, STAI	Patients undergoing therapy had a significant reduction in PASI score, from 9 at baseline to 3.8 and 2.5 at 4 and 8 w, correspondingly. Likewise, 65% of cases in the therapy group achieved PASI75 whereas only 15% of standard UVB patients did so at 8 w.
Goodman, 1994 [68]	Thermal biofeedback	Case report	13 w	1	F	56	10 y	N/A	Skin temperature	All 11 presenting psoriasis lesions vanished, and any new lesions appearing during therapy disappeared w/o visible scarring.
Hughes et al., 1981 [69]	Biothermal feedback and supportive psychotherapy	Case report	7 m	1	M	31	2 y	N/A	Psoriasis Rating Scale (developed by the authors)	Marked dermatological improvement; inability to lower the temperature at the plaque site.

Abbreviations (in alphabetical order): BSA, body surface area; C1, control 1; C2, control 2; CBT, cognitive behavioral therapy; DLQI, dermatology life quality index; eTIPs, electronic Targeted Intervention for Psoriasis; F, female; GAD-7, 7-item Generalized Anxiety Scale; GHQ-12, 12-item General Health Questionnaire; HADS, hospital anxiety depression scale; IBCT, internet-based cognitive behavioral therapy; ISDL, impact of skin disease on daily life; LDBF, laser Doppler blood flow; M, male; MBCT, mindfulness-based cognitive therapy; MBSCT, mindfulness-based self-compassion therapy; MBSCT-SH, self-help MBSCT; mo, months; N/A, not applicable; NS, not specified; PASI, psoriasis area and severity index; POMS, profile of mood states; PSAB, psoriasis skin appearance and bothersomeness; PSS-10; 10-items perceived stress scale; PUVA, photochemotherapy; QoL, quality of life; RAND-36, RAND-36 Health Status Inventory; RCT, randomized controlled trial; SAPASI, self-assessed PASI; SAS, self-rating anxiety scale; SDS, self-rating depression scale; SF-12, 12-item short form health survey; STAI, State-Trait Anxiety Inventory; T1, Therapy 1; T2, Therapy 2; T3, Therapy 3; TSS, total sign score; UVB, type B ultraviolet; VAS, visual analog scale; w, weeks; w/o, without; WHOQOL-BREF, The World Health Organization Quality of Life-BREF; y, years.

Table 4. Trials and case reports of patients undergoing balneotherapy and climatotherapy for psoriasis (arranged in order of references).

Author	Procedure	Study Design	Study/Treatment Length	Patients Included	Gender	Mean Age (y)	Average Duration of Psoriasis	Comparison Therapy	Severity Measurement	Outcome
Ben-Amitai and David., 2009 [17]	DSC	Open, uncontrolled prospective trial	2 w	17	8M/9F	Range 10–18	NS	N/A	PASI	>75% improvement in six cases, and 50–75% amelioration (moderate) in five patients. At 6 mo. Follow-up, 12 patients were relapse-free, the other 5 presented mild relapse.

Table 4. Cont.

Author	Procedure	Study Design	Study/Treatment Length	Patients Included	Gender	Mean Age (y)	Average Duration of Psoriasis	Comparison Therapy	Severity Measurement	Outcome
David et al., 2005 [18]	DSC	Multicenter controlled cross-sectional study	224 d (mean), 140 d (median)	1198: 460 Psoriasis 738 Control	261 M/199 F (P) 296 M/442 F (C)	48 (P) 47 (C)	20 y	Benign skin conditions including contact dermatitis and seborrhea (Control)	NS	Elastosis, solar lentigines, poikiloderma, and facial wrinkles—significantly more common in psoriatic patients than controls, in relation with Dead Sea exposure time. No correlation with increased risk of malignant melanoma or NMSC in psoriatic patients.
Eysteinsdóttir et al., 2014 [19]	Balneotherapy with geothermal sea water and NB-UVB	Prospective RCT	6 w	68: 22 GSW 22 IT-GSW 24 UVB	39M/29F	41/42.2/37.9	20 y/16.4 y/12.3 y	Bathing in GSW+NB-UVB vs. intensive treatment with GSW and NB-UVB vs. NB-UVB therapy alone	PASI, DLQI, Lattice score, BMI	% of patients attaining PASI 75 and 90 was significantly greater for both GSW and IT-GSW regimens than for NB-UVB monotherapy. Faster clinical and histological improvement, longer remission period and lower NB-UVB doses than for GSW-regimens than standard NB-UVB monotherapy.
Baros et al., 2014 [23]	Balneotherapy	Prospective RCT	6 w	60: 19 T1 15 T2 26 C	37M/27F	NS	NS	Standard therapy vs. balneotherapy vs. standard therapy plus balneotherapy	PASI, CRP, antistreptolysin O titer, iron, uric acid	Statistically significant difference in remission length for patients treated with combination therapy and patients treated with standard therapeutic modalities, with best results for combination therapy.
Gambichler et al., 2001 [24]	Highly concentrated salt water balneotherapy	Prospective RCT, single-blind, left-right	8 w	10	4M/6F	36 y	2.5 y	Tap water balneotherapy on opposite elbow	Severity score pertaining to desquamation, erythema, and infiltration of the psoriatic plaques.	Highly significant decrease in the baseline score, w/o significant difference between pre-treatment with salt water or tap water.

Table 4. Cont.

Author	Procedure	Study Design	Study/Treatment Length	Patients Included	Gender	Mean Age (y)	Average Duration of Psoriasis	Comparison Therapy	Severity Measurement	Outcome
Cohen et al., 2005 [25]	DSC	Prospective single-arm cohort	2 w (6–33 d)	70	40M/30F	Range 19–78 y	Range 4–30 y	N/A	PASI, BPSS (Beer Sheva Psoriasis Severity Score)	75.9% reduction in PASI and 57.5% reduction in the mean BPSS.
* Langeland et al., 2013 [26]	Gran canaria climatotherapy and patient education program	Prospective single-arm cohort	4 mo (3 w program)	254	152M/102F	47	24 y	N/A	PASI, MHC-SF	Positive mental health and health-related emotional distress recovered markedly after treatment. The longer the duration of psoriasis, and the presence of comorbidities, the greater the aforementioned improvement.
* Wahl et al., 2015 [27]	Gran Canaria climate therapy	Prospective single-arm cohort	3 w	254	152M/102F	47	24 y	N/A	PASI, SAPASI, Health Education Impact Questionnaire (heiQ)	SAPASI score improved significantly, as well as self-management; at 3 mo. follow-up, only emotional distress and disease severity stayed significantly ameliorated.
Hodak et al., 2003 [70]	DSC	Prospective single-arm cohort	4 w	27	18M/9F	Range 24–73 y	4–30 y	N/A	PASI, quantitative histologic measures	Average 81.5% decrease in PASI score, with complete therapeutic response in 13 subjects, marked in 5, moderate in 6, and slight in 2.
Czarnowicki et al., 2011 [71]	DSC	Retrospective comparison	4 w	40	25M/15F	NS	NS	Climatotherapy alone vs. climatotherapy plus MTX	PASI, BMI, BSA	DSC did not show better results in patients treated simultaneously with methotrexate
Emmanuel et al., 2020 [72]	DSC	Prospective single-arm cohort	4 w	18	12M/6F	52.2	34.2	N/A	PASI, IGA, NAPSI, NAPPA, DLQI, EQ-5D-3L, BMI	DSC led to PASI reduction of 88%, a mean decrease of 2.3 (76.7%) on the 5-IGA, and a QoL improvement as measured by DLQI and EuroQol 5D index.

Table 4. Cont.

Author	Procedure	Study Design	Study/Treatment Length	Patients Included	Gender	Mean Age (y)	Average Duration of Psoriasis	Comparison Therapy	Severity Measurement	Outcome
Emmanuel et al., 2019 [73]	DSC	Retrospective	NS	6	5M/1F	NS	NS	N/A	PASI, BSA, histological specimens	60.2% of new plaque areas reemerged within the site of former plaques, proved by histopathology.
Even-Paz et al. [74]	DSC	Prospective, non-randomized	4 w	45	24M/21F	NS	NS	Sun exposure time of 3.0/4.5/6.0 h daily	PASI	3 h of daily sun exposure at the Dead Sea, in two equal sessions from 09:00 and 14:00, respectively, were sufficient in treating psoriasis in July and August.
Frentz et al., 1999 [75]	DSC	Retrospective nation-wide cohort	6.1 y (0–22) treatment length NS	1738	872M/866F	43	NS	N/A	Presence of NMSC or other cancers at follow-up	Overall risk of cancer in patients undergoing DSC surpassed that expected in the general population, due to NMSC with an unusual distribution among body sites, age groups and sexes in these patients: young individuals and at multiple sites, numerous BCC being frequent in young women.
Harari et al., 2011 [76]	DSC	Retrospective	4 w treatment (study 2003–2007)	605	441M/164F	48.08	25.36 y	DSC for <40 y age at onset of psoriasis vs. >40 y at onset	PASI, BSA	74% of the patients <40 y at psoriasis onset had PASI 95, as opposed to 62% for >40 y. Therapeutic effect was inversely associated with the age of the patient at disease onset.
Harari et al., 2007 [77]	DSC	Prospective, single-arm cohort	4 w	64	42M/22F	41.4	16.8 y	N/A	PASI, QoL VAS	All subjects attained PASI 50, and 75.9% of cases reached PASI 75 after 1 mo of DSC, with a median remission length of 23.1 w and median therapeutic effect duration of 33.6 w. Younger patient age at therapy was correlated with a longer remission time.

Table 4. Cont.

Author	Procedure	Study Design	Study/Treatment Length	Patients Included	Gender	Mean Age (y)	Average Duration of Psoriasis	Comparison Therapy	Severity Measurement	Outcome
Harari et al., 2016 [78]	DSC	Retrospective report	3–4 w	719	505M/214F	51.24	28.01 y	N/A	PASI, BMI, body surface involvement	Previous DSC sessions were a positive predictor for an improved PASI, with a positive association between psoriasis duration (and younger age at onset) and PASI 90. More patients with photo skin type II (Fitzpatrick) achieved PASI 90 than other types.
Harari and Shani., 1997 [79]	DSC	Prospective, non-randomized trial	4 w	740	428M/312F	Range 10–72 y	NS	N/A	BSA, rheumatologic index	Percentage of clearance was best (>72%) for patients staying in the sun at least 7 h daily; lack of psychologically support led to disease clearance in 68.9% of patients, compared to 75.8% of those supported. Previous DSC sessions, moderate to severe skin surface involvement, and coexistence of arthritis increased chances of psoriasis clearance.
Kushelevsky et al., 1998 [80]	DSC	Retrospective comparison	4 w	80	NS	NS	NS	Exposure to UVB exposure in other climate therapy regions (Sweden, Switzerland, Germany, Bulgaria, New Zealand)	MED	Mean UVB exposure dose in DSC stands among the lowest reported for psoriasis clearance. Despite comparable on a monthly basis, cumulative annual phototherapy exposure is noticeably higher than the UVB doses provided on a 4-w DSC session.

Table 4. Cont.

Author	Procedure	Study Design	Study/Treatment Length	Patients Included	Gender	Mean Age (y)	Average Duration of Psoriasis	Comparison Therapy	Severity Measurement	Outcome
Kushelevsky et al., 1996 [81]	DSC	Prospective, non-randomized	4 w	688 (study 1) 502 (study 2) 1142 (study 3)	320M/368F // 238M/264F // 583M/559F	<10->60 // >65	NS	N/A	BSA	Duration of psoriasis of 40–49 y resulted in a higher clearance rate of 78.6%. The clearance rate in patients with disease onset at the ages of 10–19 y (77.8%) was superior to those in which the disease appeared 60 y (56.2%) // A mean decrease in systolic and diastolic blood pressures during DSC was noticed, regardless of sex and age, in all groups.
Nissen et al., 1998 [82]	DSC and bathing	Prospective, non-randomized	4 w	21: 10 Psoriasis 11 Healthy	NS	NS	NS	Psoriasis vs. healthy skin exposed to UV	RIA for enkephalin	Total clearance of psoriasis at sample sites; average reduction of 21% in enk levels.
Schewach-Millet et al., 1989 [83]	DSC	Retrospective study	3 y (between 2 and 8 y)—3–4 w yearly	19	NS	NS	NS	N/A	Histological specimens	Intensification of epidermal pigmentation when compared to pretreatment biopsy specimens in certain cases, w/o epidermal dystrophy or melanocytic atypia.
Trøstrup et al., 2019 [84]	DSC	Prospective single-arm cohort	4 w	49	28M/21F	51.86	NS	N/A	PASI, DLQI	11/49 patients reached PASI; 10/49 presented increased PASI; age, sex, previous DSC sessions, and duration of observation period did not affect endpoints. DSC led to a significantly increased DLQI score in 60% of cases, even several mo follow-up, whereas 20% of patients presented a marked decrease in PASI.

Table 4. Cont.

Author	Procedure	Study Design	Study/Treatment Length	Patients Included	Gender	Mean Age (y)	Average Duration of Psoriasis	Comparison Therapy	Severity Measurement	Outcome
Bogdanov et al., 2012 [85]	Climatotherapy and phototherapy	Prospective, non-randomized	2 w	93: 45 psoriasis placate 12 psoriasis palmoplantaris 36 control	55M/38F	45	NS	Narrowband phototherapy alone	DLQI	Combined climatotherapy has a significantly better beneficial effect on the QoL of the patients with psoriasis placate than phototherapy alone.
Golusin et al., 2015 [86]	Rusanda Spa balneotherapy plus calcipotriol	Prospective RCT	3 w	60: 30 Therapy 30 Control	28M/32F	55.46 (T) 41.73 (C)	NS	Balneotherapy plus calcipotriol vs. calcipotriol alone	PASI	Therapy group showed a decrease in PASI score by 59.45%, whereas in the control group it was 39.34%. Topical calcipotriol associated with Rusanda Spa balneotherapy is more efficient than topical calcipotriol alone.
Peroni et al., 2008 [87]	Comano spa balneotherapy	Prospective, non-randomized	1–2 w	280: 124 Therapy 156 Control	176M/104F	Range 18–85 y	NS	BPT (therapy) vs. balneotherapy alone	PASI, SAPASI, Skindex-29, BSA	1 w balneotherapy or BPT was enough to obtain statistically significant PASI score reduction. Both 2 w balneotherapy and BPT groups brought greater psoriasis amelioration with reduction in both PASI score and BSA.
Péter et al., 2017 [88]	Balneotherapy	Prospective single-arm cohort	3 w	80	35M/45F	63.7	NS	N/A	PASI, CRP level	After therapy, both PASI and CRP levels presented significant improvement.
Tabolli et al., 2009 [89]	Balneotherapy and BPT	Prospective, non-randomized	2 w	111: 66 Therapy 45 Control	67M/24F	>18 y	25 < 10 y; 81 > 10 y	BPT vs. Comano balneotherapy alone	SAPASI, Skindex-29, GHQ-12, SF-36	A decrease >50% after therapy in SAPASI 50 score was attained by 42% and 37% of patients in the BPT and BT groups, correspondingly. BPT group showed a statistically significant reduction in the number of GHQ-12 positive cases.

Table 4. Cont.

Author	Procedure	Study Design	Study/Treatment Length	Patients Included	Gender	Mean Age (y)	Average Duration of Psoriasis	Comparison Therapy	Severity Measurement	Outcome
Nilsen et al., 2009 [90]	Gran Canaria climate therapy	Prospective single-arm cohort	2 w	20	14M/6F	47.2	NS	N/A	PASI, UV exposure, Spectral UVB (280–315 nm), UVA (315–400 nm) and CIE-weighted UV	Reduction in overall PASI score in all patients; no significant correlation between the reduction in psoriasis area severity index scores and UV doses;
Martin et al., 2015 [91]	Balneotherapy with selenium-rich spa water (La Roche-Posay)	Prospective single-arm cohort	3 w	29	32M/22F	59	NS	Composition of skin microbial communities associated with unaffected and affected skin.	PASI, PGA, Shannon Diversity Index	PASI scores decreased post-balneotherapy. Poor bacterial biodiversity was observed, with the bacterial communities being similar on both unaffected and affected adjacent skin. Family analysis identified, for the first time, Xanthomonadaceae belonging to Proteobacteria phylum and recognized as keratolytic, was linked with clinical improvement after 3 w balneotherapy.
Pinton et al., 1995 [92]	Balneotherapy with selenium-rich spa water (La Roche-Posay)	Prospective single-arm cohort	3 w	92	46M/46F	47.3	NS	N/A	PASI, circulating soluble interleukin 2 receptor (sCD25) level	Average PASI score decreased by $47 \pm 4\%$. In total, 44 patients improved by >50%, 80 subjects responded with a mean decrease in the PASI score of 52.6 and 10 were stable with 10% improvement or less. Men responded markedly better than women. An association between PASI score decrease and the rise in the plasma selenium levels was noticed.

Table 4. Cont.

Author	Procedure	Study Design	Study/Treatment Length	Patients Included	Gender	Mean Age (y)	Average Duration of Psoriasis	Comparison Therapy	Severity Measurement	Outcome
Wang et al., 2020 [93]	Balneotherapy plus Chinese herbal medicine	Prospective RCT	NS	190: 97 Therapy 93 Control	103M/87F	NS	NS	Consolidated CHM balneotherapy and NB-UVB (CTG) vs. unconsolidated (stopped after PASI drop to 1.8–2.0) (UTG)	PASI	No significant difference in PASI score between the two groups at the initiation and the termination of therapy. However, the mean remission length in CTG was 10.99 mo, significantly longer than UTG (7.94 mo).
Tsourelis-Nikita et al., 2002 [94]	Balneotherapy with Leopoldine spa water	Prospective single-arm cohort	4 w	10	7M/3F	Range 28–53 y	NS	Leopoldine water vs. double-distilled water	PASI, immunohistological study	Average PASI improvement for Leopoldine spa water treated arms was 85.9%, whereas double-distilled water treated arms had 50.5% PASI improvement. Significant differences between cutaneous samples taken before and after 4 w of Leopoldine spa water therapy.
Melandri et al., 2019 [95]	Liman peloid baths and heliotherapy at Cervia spa, Emilia, Italy	Prospective RCT	2.5 w	91: 56 Therapy 35 Control	57M/24F	52.3/57.9	NS	Liman peloid application followed by bath therapy vs. clay peloid mixed with tap water	PASI	Compared with the control group, there was a significant improvement in PASI score and fewer psoriasis recurrences in the therapy group, aside from a marked reduction in the topical use of cortisone and nonsteroid drugs.

* Denotes the same patient population between the two studies, as indicated by the number of individuals recruited, gender distribution, mean age, the duration of the treatment program, and average length of disease [26,27]. Abbreviations (in alphabetical order): BCC, basal cell carcinoma; BMI, body-mass index; BPSS, Beer Shiva psoriasis severity score; BSA, body surface area; BPT, balneophototherapy; C, control; CRP, C reactive protein; CTG, consolidated therapy group; DLQI, dermatology life quality index; DSC, Dead Sea climatotherapy; enk, enkephalin; EQ-5D-3L, EuroQol–5 Dimensions–3 Levels (EQ-5D-3L); F, female; GHQ-12, 12-item General Health Questionnaire; GSW, geothermal spring water balneotherapy; H, healthy controls; 5-IGA, 5-point Investigator’s Global Assessment; IT-GSW, intensive geothermal spring water balneotherapy M, male; MED, minimal erythema dose; mo, months; MTX, methotrexate; N/A, not applicable; NAPPA, Nail Assessment in Psoriasis and Psoriatic Arthritis; NAPSI, Nail Psoriasis Severity Index; nm, nanometers; NMSC, non-melanoma skin cancer; NS, not specified; P, psoriasis; PASI, psoriasis area and severity index; PGA, physician global assessment; PUVA, photochemotherapy; QoL, quality of life; QoL VAS, quality of life visual analog scale; RCT, randomized controlled trial; RIA, radioimmunoassay; SAPASI, self-assessed PASI; SAS, self-rating anxiety scale; sCD25, circulating soluble interleukin 2 receptor; SDS, self-rating depression scale; SF-36, 36-item Short Form of the Medical Outcomes Study questionnaire; STAI, State-Trait Anxiety Inventory; T1, Therapy 1; T2, Therapy 2; UTG, unconsolidated therapy group; UV, ultraviolet; UVA, type A ultraviolet; UVB, type B ultraviolet; vs., versus w, weeks; w/o, without; y, years.

4. Discussion

4.1. Acupuncture

Acupuncture is a well-known Traditional Chinese Medicine (TCM) practice that has been successfully utilized for more than three millennia. It is generally considered a safe approach, with few side-effects, being accepted across the world for numerous ailments [96]. The exact origin of acupuncture is unknown, and a few styles have been defined, for example needling, moxibustion, cupping and acupressure. It is important to note that acupuncture is customarily used in combination with other therapeutic approaches of TCM, such as herbal remedies. In needling for psoriasis, there are several acupuncture points available in which, as the name implies, disposable needles are inserted into the skin to stimulate blood flow and reduce local inflammation through an as-of-yet imprecise mechanism [97]. A recent study performed on mice discovered that electroacupuncture, needling and fire needling was correlated with a lower local CD3+ T-cell population, as well as lower levels of substance P, neurokinin A, IL-17A, IL-1B, and IL-23p40 [96]. Acupoint stimulation should be implemented for a period of at least of six weeks in order to achieve therapeutic effect [98,99]. Some authors have reported a decreased recurrence rate of plaque psoriasis after acupuncture when compared to conventional medicine [96]. Still, not all authors agree on the efficacy of acupuncture, as data are scarce and, at least until recently, not always easily accessible to the researching community [98]. A recent meta-analysis on the use of acupuncture in psoriasis comprising 13 RCTs and a total of 1060 participants has shown that acupoint stimulation had a superior effect to the placebo (non-acupoint stimulation) [99]. However, the trials included in this meta-analysis clashed regarding the specific acupoints used, the exact number of stimulated points, as well as duration of acupuncture sessions. Furthermore, adequate blinding was realized in only two of the studies, thus making a proper comparison difficult. Nevertheless, according to the findings of these analyses, the acupuncture appears to provide benefits in the treatment of psoriasis irrespective of the stage of the disease, although it is challenging to ascertain the most advantageous technique [12,100].

Two RCTs did not show a significant improvement in PASI score when compared to a control procedure, either sham acupuncture [28], or oral Huoxue Jiedu Decoction and Vaseline cream alone [29], although the latter did demonstrate an amelioration in the quality of life. A third RCT revealed a significant improvement in PASI within both the treatment with auricular therapy plus optimized Yinxieling formula and control groups, yet more so in the former, whereas DLQI scores presented a non-significant decrease in these groups [30]. According to Jorge et al., ear acupuncture managed to result in the complete disappearance of psoriasis in five of their seven patients, while the remaining two presented marked recovery [31]. A retrospective study on 61 patients demonstrated moderate improvement in psoriasis patients, on average [19], while another such account of 80 patients observed a 91.3% treatment effectiveness, with 41 cured, 18 markedly improved, and 14 individuals improved [20]. However, no standard evaluation score was provided for accurate comparison. We identified four case reports totaling five patients that benefitted from clinical improvement after acupuncture [32–35], one even demonstrating the complete disappearance of lesions [32]. Two of these reports did not provide a severity score, and as such a more objective evaluation could not be performed [34,35]. There were also two case reports of patients presenting with Koebner phenomenon after acupuncture [36,37]. The Koebner phenomenon, as defined by the German dermatologist Heinrich Koebner (1838–1904), denotes the manifestation of isomorphic lesions at the sites of a cutaneous injury in an otherwise healthy skin [38,101]. It can occur in several dermatological afflictions, most commonly psoriasis, lichen planus, and vitiligo. Therefore, it is likely that interventions that involve damaging the dermis, such as acupuncture and cupping, may trigger this type of lesion in psoriatic patients.

Despite our rigorous search in this field of CAM, reference cross-check did not yield several of the cited articles. As such, we could not discuss some of the studies included in other reviews and meta-analyses. Regarding the use of acupuncture and its associated

procedures, the majority of reports show a positive effect on the amelioration of psoriatic plaques. Several articles written in Chinese and not readily accessible to Western readers may provide further insight into the benefits of acupuncture in psoriasis. As of the writing of this review, a number of trials on the benefits of various acupuncture techniques in psoriasis are currently ongoing [97,102]. The reason for including acupuncture in our review of CAM methods for this disease is primarily because of its popular use in China and other Eastern countries.

4.2. Cupping Therapy

Cupping therapy is an ancient treatment method likened to acupuncture, also employed for various diseases. It has been described since antiquity, from the ancient Egyptians to the Chinese Han Dynasty, also being used in the times of Hippocrates and even to the early Islamic period [103–105]. Two types of cupping methods exist, namely dry and wet, also known as Hijama (or Hijamah) in Egypt and Arabic countries [39–44,106]. This treatment method creates a vacuum by placing glass suction cups directly on the skin of various body parts, mostly on the back, shoulders, buttocks or limbs [15,106]. The difference between dry and wet cupping stands in that the latter requires a skin incision either before or after performing the suctioning itself. Thus, it is believed that impurities in the blood and tissues can be drawn out, instead of simply transferred from one body site to another. The moving cupping method is a unique dry type of cupping that involves the application of lubricant (such as Vaseline) either to the treated body part or to the mouth of the glass cup and adsorbing the cup to the desired area. The physician then moves the glass cup manually across the skin in all directions while applying light force, thus producing flushing, heightened tissue blood flow, and in some cases even ecchymosis in the chosen treatment area [103]. This causes a local accumulation of antioxidant and anti-inflammatory products such as heme-oxygenase-1, carbon monoxide, biliverdin, and bilirubin, which also have antiproliferative and neuromodulatory effects [104]. Additionally, it was shown that cupping induces vascular endothelial growth factor (VEGF)-A expression in keratinocytes via the nitric oxide (NO)-mediated activation of hypoxia inducible factor (HIF)-1, thereby promoting angiogenesis [105]. It is thought that this method has the ability to increase skin tolerance and significantly improve its barrier function [104,105] and has already proven effective in the management of pain-related diseases, such as chronic low back pain or osteoarthritis [103]. A multicenter RCT trial is currently underway in China, aiming to determine the efficacy of moving cupping in the treatment of plaque psoriasis [103].

However, current evidence in the English literature is far from encouraging. The study of El-Domyati et al., which enrolled 50 patients with various dermatoses, including eight with psoriasis vulgaris, failed to show any improvement in psoriatic patients [14]. Moreover, three of these patients demonstrated Koebner phenomenon at the site of cupping, leading to the termination of therapy. Contrarily, all individuals with chronic idiopathic urticaria, 10 out of 11 of acne vulgaris patients (90.9%), and two out of nine with atopic dermatitis (22.2%), showed clinical improvement, whereas none of the patients with vitiligo presented any changes. In the report by Sharquie et al., 24 patients presented with on-site Koebner phenomenon after undergoing cupping, 16 (66.7%) of whom had been previously diagnosed with psoriasis [15]. Six other case reports demonstrated the Koebner phenomenon strictly on the regions receiving cupping therapy [40–44], and to the best of our knowledge, only the patient described by Malik et al. benefited from a reduction in disease severity after wet cupping [39]. Interestingly, only male patients were included in these reports, yet no explanation could be given for this reason. While we are aware that the Chinese literature holds several studies pertaining to the beneficial effects of cupping in psoriasis [107], these were either inaccessible to us or did not have an English full-text version. Thus, as it stands, there is little evidence in the Western literature to support cupping therapy as an effective or beneficial CAM management in psoriasis.

4.3. Psychotherapy, Stress Management and Meditation

Psoriasis is known to cause significant psychological distress, depression, feelings of stigmatization, and reduced health-related quality of life [108]. Moreover, stress has been recognized as a trigger factor in both the appearance and exacerbation of psoriasis, aggravating the cutaneous manifestations of the disease in more than half of the patients. Psychotherapy has been studied in several trials and individual case reports, with the results being promising [45–47], even as early as one millennium ago [48], but sometimes with little difference from the control groups receiving usual care or no treatment at all [16,49,50]. As of yet, the mechanism through which stress initiates or worsens this disease is unclear; however, some studies have shown marked improvement in the clinical state after psychotherapy. An RCT comparing phototherapy with and without listening to mindfulness-based stress reduction recordings during treatment sessions revealed that clinical improvement was achieved markedly faster in the meditation group [51]. The beneficial effects of hypnosis in psoriasis were evaluated in several case reports [52–54], as well as an RCT of 11 patients, which suggested that easily hypnotizable patients showed greater improvements in disease control [55]. Guided imagery, meditation, and cognitive-behavioral stress management was shown to offer moderate but statistically significant improvement when PASI, total sign score (TSS), and Doppler blood flow to psoriatic plaques were assessed [50]. Although the same trial did not yield a significant difference in PASI scores between the treatment group and the control group that did not receive any form of therapy. Meditation with or without imagery produced a marked clinical amelioration compared to no therapy at all, yet the mentioned study was limited by the small number of patients included [56]. The same effect can be observed when assessing Medical Resonance Therapy Music with standard care against standard care alone, although no statistical significance was specified [57].

In one prospective RCT of 40 patients, written emotional disclosure combined with UVB therapy led to a better clinical result and a longer period of time than the standard UVB treatment [58]. Nonetheless, two other RCTs on written emotional disclosure did show improvement in both treatment and control groups with control writing intervention (focusing on activities of the previous day) [59] and educational intervention, respectively [60], yet no significant difference between treatment and control groups was observed. Mindfulness-based cognitive therapy MBCT and its variants, mindfulness-based self-compassion therapy (MBSCT), and self-help MBSCT (MBSCT-SH), have yielded positive results, though mixed in comparison with treatment as usual [61,62]. Similarly, internet-based cognitive behavioral therapy (ICBT) managed to improve physical functioning and diminish the impact of psoriasis on everyday activities in patients presenting a psychological risk profile, and also enhanced and maintained psychological wellbeing [63,64]. Based on the RCT by Bundy et al., a web-based online electronic Targeted Intervention for Psoriasis (eTIPs), also a form of cognitive-behavioral therapy, did not achieve a significantly different result when compared to standard care, yet, as the authors mentioned, the results were constrained by a large quantum of missing data [65]. Support group therapy may have the benefit of both clinical improvement and enhancing the patients' knowledge and ability to cope with the disease [21,66]. As stated by Piaserico et al., biofeedback and cognitive-behavioral therapy and UVB therapy resulted in a significant reduction in psoriasis severity, as quantified by PASI, in addition to a higher percentage of patients achieving PASI 75 response at 8 weeks in comparison to patients receiving only UVB therapy [67]. Thermal biofeedback led to the complete disappearance of all previously existing psoriasis lesions, as well as the disappearance without scarring of any new ones occurring during treatment in one reported case [68]. In another similar description, thermal biofeedback in conjunction with supportive psychotherapy managed to markedly ameliorate dermatological signs [69]. Although promising, these studies are few in number, are small in size, and some of them are steadily becoming outdated. Furthermore, despite no obvious risk tied to meditation or hypnotherapy, some argue that there is little evidence

to support them as financially justifiable treatment methods [109]. Nevertheless, this may prove an advantageous complementary treatment method of psoriasis in the future.

Considering that psoriasis is stress-mediated, it stands to reason that psychotherapy and interventions that focus on stress reduction might be beneficial for these patients. The results of the majority of studies are promising; however, not conclusive. The remarkable variation in therapy length may be due to the heterogeneity of therapies included in this group, as well as individual characteristics and requirements of each patient. It is important to notice that these therapies are mostly used in conjunction with treatment as usual and should not be viewed as a replacement to standard care.

4.4. Balneotherapy and Climatotherapy

Balneotherapy and Climatotherapy denote already established CAM treatment methods in moderate-to-severe psoriasis, having been proven effective in the short-term clearing and remission induction across several studies [18,70,110,111]. The most common destination for climate therapy is the Dead Sea, with 18 out of the total of 34 studies included having been conducted there [17,18,25,70–84]. This treatment method implies spending several weeks at the Dead Sea, bathing in its waters and lying in the sun. The Dead Sea is located on the lowest point on the landmasses of Earth, at approximately 400 m below sea level, possessing the highest concentration of salt of any natural body of water. It boasts exceptional climatic properties, which are beneficial for a wide variety dermatological conditions, specifically for psoriasis. The efficacy of Dead Sea climatotherapy is probably the result of a mixture between the anti-inflammatory effects of stress reduction, the anti-proliferative and keratolytic effects of local minerals, and the particular UV characteristics at that latitude [18,70,110,111]. More precisely, UVA and longer wavelength beneficial UVB rays are found at the site of the Dead Sea, whereas shorter erythrogenic UVB rays are generally filtered [11]. Severe adverse events following this type of therapy are rare. According to David et al., climatotherapy at the Dead Sea for psoriasis patients was more frequently associated with elastosis, solar lentigines, poikiloderma, and facial wrinkles than in control patients, also displaying an exposure-dependent response [18]. Additionally, the same study concluded that Dead Sea climate therapy was not correlated with a heightened risk of developing melanoma or nonmelanoma skin cancer in these patients. Another retrospective study concluded that some of these patients present an increase in epidermal pigmentation when compared to pretreatment biopsy specimens, although there were no epidermal dystrophies or melanocytic atypia reported [83]. Contrariwise, consistent with the findings by Frentz et al., the overall risk of skin malignancies (especially non-melanoma skin cancer) in patients undergoing this therapy was higher than estimated for the general population [75]. The body surface distribution of cutaneous cancers favored multiple sites, and typically affected younger individuals, especially women. Reoccurrence of psoriatic lesions at previous sites can occur after a given period of time following Dead Sea climate therapy [73].

Several prospective cohorts demonstrated a significant decrease in PASI scores in patients following Dead Sea climatotherapy, the majority of individuals achieving a PASI 75 response or more [25,70,72,74,77,79,84]. Furthermore, some of these studies also showed an improved quality of life, as measured by DLQI [72,84]. Both Kushelevski and Harari reported a higher clearance rate of lesions in patients with early-onset psoriasis and those with a longer duration of the disease [76–78,81]. Currently, the influence of the number of previous climate therapy stays on clinical amelioration has not been definitively established [78,84]. Another ambiguity is the daily exposure to sun needed to effectively treat psoriasis, on one hand Even-Paz et al. stating that 3 h divided in two equal sessions from 9 AM and 2 PM were sufficient when compared to 4.5 and 6 h per day [74], and on the other, Harari and Shani reporting that the best results were obtained in patients staying in the sun at least 7 h daily [74]. Patients additionally receiving systemic therapies such as methotrexate might not demonstrate better results than those undergoing climate therapy alone [71].

Other locations that have climatotherapeutic or balneotherapeutic (bathing in hot springs) effects are in the Black Sea, Nord Sea, Baltic Sea, Canary Islands, Kangal Hot Springs in Turkey, or the Blue Lagoon in Iceland, but the evidence regarding each of these sites is lacking when compared to the Dead Sea [11,18,70,110,111]. Balneotherapy alone or in combination with standard treatment or phototherapy has repeatedly proven to be more effective than standard treatment alone [23,85–89]. Geothermal sea water balneotherapy and narrowband UVB (NB-UVB) light therapy is apparently more effective in attaining clinical and histological amelioration, results in longer remission time and allows for lower UV doses than NB-UVB therapy alone [21]. Gran Canaria climate therapy has also shown potential in decreasing psoriasis severity, as well as promoting mental health and improving health-related emotional distress [25,26,90]. Balneotherapy in the selenium-rich waters of La Roche-Posay also has the potential of reducing severity [91,92]. Moreover, as concluded in the study of skin microbiome composition in these patients, the Xanthomonadaceae family associated with Proteobacteria phylum, and recognized as keratolytic, was linked to clinical amelioration after a 3-week balneotherapy treatment [91].

Consolidated balneotherapy supplemented with Chinese herbal medicine led to a notably longer remission time than the unconsolidated form, which was stopped after PASI dropped to 1.8–2.0 [93]. Leopoldine spa water balneotherapy showed a marked and statistically significant improvement when compared to double-distilled tap water treatment on the opposite arms of the same patients [94]. However, in another similar study, no significant difference was noticed between highly concentrated salt water and simple tap water balneotherapy [24]. Liman peloid application and bath therapy was also associated with benefits to severity score, time to recurrence, and a reduction in topical drug use than clay peloid and tap water [95].

This treatment form presented the most homogeneous treatment length, usually at around 3–4 weeks, although extremes of 6 days and 8 months were also noticed. Additionally, the average age of patients following these therapies was higher than for the other treatments, though this could be a simple incidental observation. The evidence on hand supports balneotherapy and climate therapy as complementary therapies for psoriasis, capable of even inducing remission. A special recommendation should be given to patients with early-onset psoriasis and those with a longer disease duration, while caution must be taken for immunocompromised individuals or those with a history of skin malignancies.

5. Limitations

The major limitation of this review is the exclusion of numerous articles written in Chinese or Korean that were unfortunately inaccessible and could have provided valuable insight into the effects of CAM methods in psoriasis. It is possible that the conclusions drawn would have differed considerably, had these studies also been incorporated. We are aware that the English literature is lacking in fields such as acupuncture and cupping therapy, and so practitioners are specialized in these interventions in Western countries, as opposed to those in Asia. Furthermore, several articles that we tried to verify through reference cross checking could not be found on any of the search engines we utilized. Another limitation is that some of the conclusions, especially concerning acupuncture and cupping, are drawn from single-patient case reports, which do not hold the same statistical significance as randomized controlled trials.

6. Conclusions

CAM, with reference to stress management interventions, balneo-, and climatotherapy, in conjunction with usual care, has the potential to help psoriasis patients reach remission faster and for longer periods of time compared to standard therapy alone. Concerning acupuncture, despite being popular in China even for the management of psoriasis, the English literature is as of yet inconclusive, whereas no evidence supports cupping therapy as being safe or effective, but potentially harmful due to the extremely high incidence of subsequent Koebner phenomenon. Therefore, these latter two options are not viable

alternative treatment methods based on current available evidence. We emphasize that standard therapies, such as topical, systemic, and biologic agents, should always be considered before attempting CAM methods, since there is a larger body of evidence to support the effectiveness of these treatments. Furthermore, additional research in the form of prospective trials should be performed before establishing acupuncture and cupping as beneficial in psoriasis management.

Author Contributions: Conceptualization, T.L.T. and I.A.F.; methodology, I.A.F.; software, T.L.T. and I.A.F.; validation, T.L.T., I.A.F., D.R.M., and R.O.; investigation, T.L.T. and I.A.F.; data curation, I.A.F.; writing—original draft preparation, T.L.T., I.A.F., and D.R.M.; writing—review and editing, T.L.T. and R.O.; supervision, R.O. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Harden, J.L.; Krueger, J.G.; Bowcock, A.M. The immunogenetics of Psoriasis: A comprehensive review. *J. Autoimmun.* **2015**, *64*, 66–73. [[CrossRef](#)] [[PubMed](#)]
2. Colombo, D.; Cassano, N.; Bellia, G.; Vena, G.A. Gender medicine and psoriasis. *World J. Dermatol.* **2014**, *3*, 36–44. [[CrossRef](#)]
3. Langley, R.G.; Ellis, C.N. Evaluating psoriasis with Psoriasis Area and Severity Index, Psoriasis Global Assessment, and Lattice System Physician's Global Assessment. *J. Am. Acad. Dermatol.* **2004**, *51*, 563–569. [[CrossRef](#)] [[PubMed](#)]
4. Walsh, J.A.; Jones, H.; Mallbris, L.; Duffin, K.C.; Krueger, G.G.; Clegg, D.O.; Szumski, A. The Physician Global Assessment and Body Surface Area composite tool is a simple alternative to the Psoriasis Area and Severity Index for assessment of psoriasis: Post hoc analysis from PRISTINE and PRESTA. *Psoriasis Targets Ther.* **2018**, *8*, 65–74. [[CrossRef](#)] [[PubMed](#)]
5. Cardiff University Department of Dermatology Website. Available online: www.cardiff.ac.uk/dermatology/quality-of-life/dermatology-quality-of-life-index-dlq (accessed on 20 February 2021).
6. Rønholt, K.; Iversen, L. Old and New Biological Therapies for Psoriasis. *Int. J. Mol. Sci.* **2017**, *18*, 2297. [[CrossRef](#)]
7. Iannone, L.F.; Bennardo, L.; Palleria, C.; Roberti, R.; De Sarro, C.; Naturale, M.D.; Dastoli, S.; Donato, L.; Manti, A.; Valenti, G.; et al. Safety profile of biologic drugs for psoriasis in clinical practice: An Italian prospective pharmacovigilance study. *PLoS ONE* **2020**, *15*, e0241575. [[CrossRef](#)]
8. Sbidian, E.; Chaimani, A.; Garcia-Doval, I.; Do, G.; Hua, C.; Mazaud, C.; Droitcourt, C.; Hughes, C.; Ingram, J.R.; Naldi, L.; et al. Systemic pharmacological treatments for chronic plaque psoriasis: A network meta-analysis. *Cochrane Database Syst. Rev.* **2017**, *12*, CD011535. [[CrossRef](#)]
9. Dattola, A.; Silvestri, M.; Tamburi, F.; Amoroso, G.F.; Bennardo, L.; Nisticò, S.P. Emerging role of anti-IL23 in the treatment of psoriasis: When humanized is very promising. *Dermatol. Ther.* **2020**, *33*, e14504. [[CrossRef](#)]
10. Dattola, A.; Silvestri, M.; Bennardo, L.; Passante, M.; Rizzuto, F.; Dastoli, S.; Patrino, C.; Bianchi, L.; Nisticò, S.P. A novel vehicle for the treatment of psoriasis. *Dermatol. Ther.* **2020**, *33*, e13185. [[CrossRef](#)]
11. Talbott, W.; Duffy, N. Complementary and Alternative Medicine for Psoriasis: What the Dermatologist Needs to Know. *Am. J. Clin. Dermatol.* **2015**, *16*, 147–165. [[CrossRef](#)]
12. Gamret, A.C.; Price, A.; Fertig, R.M.; Lev-Tov, H.; Nichols, A.J. Complementary and alternative medicine therapies for psoriasis: A systematic review. *JAMA Dermatol.* **2018**, *154*, 1330–1337. [[CrossRef](#)]
13. Armstrong, A.W.; Robertson, A.D.; Wu, J.; Schupp, C.; Lebwohl, M.G. Undertreatment, Treatment Trends, and Treatment Dissatisfaction Among Patients with Psoriasis and Psoriatic Arthritis in the United States: Findings from the National Psoriasis Foundation Surveys, 2003–2011. *JAMA Dermatol.* **2013**, *149*, 1180–1185. [[CrossRef](#)]
14. El-Domyati, M.; Saleh, F.; Barakat, M.; Mohamed, N. Evaluation of cupping therapy in some dermatoses. *Egypt Dermatol. Online J.* **2013**, *9*, 2.
15. Al-Jaralla, F.A.; Sharquie, K.E. Cupping (Hijama) in Skin diseases with positive Koebner's Phenomenon: What is New? *J. Clin. Exp. Investig.* **2019**, *10*, em00726. [[CrossRef](#)]
16. Fortune, D.G.; Richards, H.L.; Griffiths, C.E.M.; Main, C.J. Targeting cognitive-behaviour therapy to patients' implicit model of psoriasis: Results from a patient preference controlled trial. *Br. J. Clin. Psychol.* **2004**, *43*, 65–82. [[CrossRef](#)]
17. Ben-Amitai, D.; David, M. Climatotherapy at the Dead Sea for Pediatric-Onset Psoriasis Vulgaris. *Pediatr. Dermatol.* **2009**, *26*, 103–104. [[CrossRef](#)]
18. David, M.; Tsukrov, B.; Adler, B.; Hershko, K.; Pavlotski, F.; Rozenman, D.; Hodak, E.; Paltiel, O. Actinic damage among patients with psoriasis treated by climatotherapy at the Dead Sea. *J. Am. Acad. Dermatol.* **2005**, *52*, 445–450. [[CrossRef](#)]
19. Liao, S.J.; Liao, T.A. Acupuncture Treatment for Psoriasis: A Retrospective Case Report. *Acupunct. Electro Ther. Res.* **1992**, *17*, 195–208. [[CrossRef](#)]

20. Ye, L. Treatment of psoriasis by acupuncture plus Chinese herbs: A report of 80 cases. *J. Acupunct. Tuina Sci.* **2004**, *2*, 16–17. [[CrossRef](#)]
21. Abel, E.A.; Moore, U.S.; Glathe, J.P. Psoriasis Patient Support Group and Self-Care Efficacy as an Adjunct to Day Care Center Treatment. *Int. J. Dermatol.* **1990**, *29*, 640–643. [[CrossRef](#)]
22. Eysteinsdóttir, J.H.; Ólafsson, J.H.; Agnarsson, B.A.; Lúðvíksson, B.R.; Sigurgeirsson, B. Psoriasis treatment: Faster and long-standing results after bathing in geothermal seawater. A randomized trial of three UVB phototherapy regimens. *Photodermatol. Photoimmunol. Photomed.* **2013**, *30*, 25–34. [[CrossRef](#)] [[PubMed](#)]
23. Baros, D.N.; Gajanin, V.S.; Gajanin, R.B.; Zrnić, B. Comparative analysis of success of psoriasis treatment with standard therapeutic modalities and balneotherapy. *Med. Pregl.* **2014**, *67*, 154–160. [[CrossRef](#)] [[PubMed](#)]
24. Gambichler, T.; Rapp, S.; Senger, E.; Altmeyer, P.; Hoffmann, K. Balneophototherapy of psoriasis: Highly concentrated salt water versus tap water—A randomized, one-blind, right/left comparative study. *Photodermatol. Photoimmunol. Photomed.* **2001**, *17*, 22–25. [[CrossRef](#)] [[PubMed](#)]
25. Cohen, A.D.; Van-Dijk, D.; Naggan, L.; Vardy, D.A. Effectiveness of climatotherapy at the Dead Sea for psoriasis vulgaris: A community-oriented study introducing the ‘Beer Sheva Psoriasis Severity Score’. *J. Dermatol. Treat.* **2005**, *16*, 308–313. [[CrossRef](#)]
26. Langeland, E.; Robinson, H.S.; Moum, T.; Larsen, M.H.; Wahl, A.K. Mental health among people with psoriasis undergoing patient education in climate therapy. *Scand. J. Psychol.* **2013**, *54*, 508–514. [[CrossRef](#)]
27. Wahl, A.; Langeland, E.; Larsen, M.; Robinson, H.; Osborne, R.; Krogstad, A. Positive Changes in Self-management and Disease Severity Following Climate Therapy in People with Psoriasis. *Acta Derm. Venereol.* **2015**, *95*, 317–321. [[CrossRef](#)]
28. Jerner, B.; Skogh, M.; Vahlquist, A. A controlled trial of acupuncture in psoriasis: No convincing effect. *Acta Derm. Venereol.* **1997**, *77*, 154–156.
29. Pan, H.-D.; Qi, X.-L.; Wang, L.; He, J.-Y.; Liu, J.-L.; Zhang, Y.-B.; Tian, Y.; Duan, X.-W.; Yang, H.-Y.; Bai, Y.-P. Whether Fire-needle Therapy Benefits Plaque Psoriasis: A Multicenter, Randomized, and Controlled Trial. *Chin. J. Integr. Med.* **2019**, *25*, 259–263. [[CrossRef](#)]
30. Lu, C.-J.; Xiang, Y.; Xie, X.-L.; Xuan, M.-L.; He, Z.-H. A randomized controlled single-blind clinical trial on 84 outpatients with psoriasis vulgaris by auricular therapy combined with optimized Yinxieling Formula. *Chin. J. Integr. Med.* **2012**, *18*, 186–191. [[CrossRef](#)]
31. Jorge, M.; Silverio-Lopes, S.; Carneiro-Suliano, L. Case Report: Ear Acupuncture Therapy for Psoriasis. *J. Complement. Altern. Med. Res.* **2016**, *1*, 1–8. [[CrossRef](#)]
32. Jeon, Y.-C. Treatment for an Adult Patient with Psoriasis with Traditional Korean Medicine, Especially Sa-Am Acupuncture and Herbal Medicine. *J. Acupunct. Meridian Stud.* **2016**, *9*, 88–92. [[CrossRef](#)]
33. Lee, S.-R.; Kim, S.; Park, C.-E.; Lee, J.-H.; Lee, D.-H. Effect of Korean medicine as add-on therapy to phototherapy for psoriasis: Two case report. *Medicine* **2019**, *98*, e14526. [[CrossRef](#)]
34. Mahović, D.; Mrišić, F. Acupuncture as a Complementary Method of Traditional Psoriasis Treatment: Myth or Reality? *Acta Dermatovenerol. Croat.* **2016**, *24*, 221–222.
35. Zhu, J.; Arsovska, B.; Kozovsk, K. Acupuncture Treatment for Psoriasis Present on the Soles. *J. Surg.* **2017**, *1*, 5. [[CrossRef](#)]
36. Wu, J.J.; Caperton, C. Psoriasis Flare from Koebner’s Phenomenon after Acupuncture. *N. Engl. J. Med.* **2013**. [[CrossRef](#)]
37. Zhu, L.-L.; Hong, Y.; Zhang, L.; Huo, W.; Zhang, L.; Chen, H.-D.; Gao, X.-H. Needle Acupuncture-Induced Koebner Phenomenon in a Psoriatic Patient. *J. Altern. Complement. Med.* **2011**, *17*, 1097–1098. [[CrossRef](#)]
38. Pavlov, S.; Dimitrova, M. Koebner phenomenon caused by bloodletting and cupping therapy in a patient with psoriasis. *Scr. Sci. Med.* **2019**, *51*, 32–36. [[CrossRef](#)]
39. Malik, I.A.; Akhter, S.; Kamal, M.A. Treatment of psoriasis by using Hijamah: A case report. *Saudi J. Biol. Sci.* **2015**, *22*, 117–121. [[CrossRef](#)]
40. Ekinci, A.P.; Pehlivan, G. Cupping therapy as alternative medicine turns into a trigger of disease via the Koebner phenomenon: A case report of Hijama-induced psoriasis and review of the literature. *Dermatol. Ther.* **2020**, *33*, e14264. [[CrossRef](#)]
41. Suh, H.Y.; Kim, K.H.; Jeon, J.W.; Ahn, J.Y.; Park, M.Y.; Youn, J.I. Koebner Phenomenon Related to Cupping Therapy in a Patient with Psoriasis. *Korean J. Dermatol.* **2016**, *54*, 499–500.
42. Tang, L.; Liao, Y.; Xu, J.; Li, C. Koebner phenomenon induced by cupping therapy in the unstable stage of psoriasis: A case report. *Dermatol. Ther.* **2021**, e14852. [[CrossRef](#)]
43. Vender, R.; Vender, R. Paradoxical, Cupping-Induced Localized Psoriasis: A Koebner Phenomenon. *J. Cutan. Med. Surg.* **2015**, *19*, 320–322. [[CrossRef](#)]
44. Yu, R.-X.; Hui, Y.; Li, C.-R. Koebner phenomenon induced by cupping therapy in a psoriasis patient. *Dermatol. Online J.* **2013**, *19*, 18575.
45. Price, M.L.; Mottahedin, I.; Mayo, P.R. Can psychotherapy help patients with psoriasis? *Clin. Exp. Dermatol.* **1991**, *16*, 114–117. [[CrossRef](#)]
46. Schmid-Ott, G. Depth Psychology-Founded Psychotherapy of Psoriatic Patients—Treatment of a Patient with Chronic Recidivating Psoriasis vulgaris. *Dermatol. Psychosom.* **2000**, *1*, 112–116. [[CrossRef](#)]
47. Shah, R.; Bewley, A. Psoriasis: ‘the badge of shame’. A case report of a psychological intervention to reduce and potentially clear chronic skin disease. *Clin. Exp. Dermatol.* **2014**, *39*, 600–603. [[CrossRef](#)]

48. Shafii, M.; Shafii, S.L. Exploratory Psychotherapy in the Treatment of Psoriasis. Twelve hundred years ago. *Arch. Gen. Psychiatry* **1979**, *36*, 1242–1245. [[CrossRef](#)]
49. Tengattini, V.; Foschi, L.; Rucci, P.; Iommi, M.; Fantini, M.P.; Patrizi, A.; Bardazzi, F. Effectiveness of psychological intervention in psoriatic patients relative to standard care. *Eur. J. Dermatol.* **2019**, *29*, 231–233. [[CrossRef](#)]
50. Zachariae, R.; Øster, H.; Bjerring, P.; Kragballe, K. Effects of psychologic intervention on psoriasis: A preliminary report. *J. Am. Acad. Dermatol.* **1996**, *34*, 1008–1015. [[CrossRef](#)]
51. Kabat-Zinn, J.; Wheeler, E.; Light, T.; Skillings, A.; Scharf, M.J.; Cropley, T.G.; Hosmer, D.; Bernhard, J. Influence of a mindfulness meditation-based stress reduction intervention on rates of skin clearing in patients with moderate to severe psoriasis undergoing phototherapy (UVB) and photochemotherapy (PUVA). *Psychosom. Med.* **1998**, *60*, 625–632. [[CrossRef](#)]
52. Frankel, F.H.; Misch, R.C. Hypnosis in a case of long-standing psoriasis in a person with character problems. *Int. J. Clin. Exp. Hypn.* **1973**, *21*, 121–130. [[CrossRef](#)] [[PubMed](#)]
53. Kline, M.V. Psoriasis and hypnotherapy: A case report. *J. Clin. Exp. Hypn.* **1954**, *2*, 318–322. [[CrossRef](#)]
54. Waxman, D. Behaviour therapy of psoriasis—A hypnoanalytic and counter-conditioning technique. *Postgrad. Med. J.* **1973**, *49*, 591–595. [[CrossRef](#)] [[PubMed](#)]
55. Tausk, F.; Whitmore, S.E. A pilot study of hypnosis in the treatment of patients with psoriasis. *Psychother. Psychosom.* **1999**, *68*, 221–225. [[CrossRef](#)] [[PubMed](#)]
56. Gaston, L.; Crombez, J.C.; Lassonde, M.; Bernier-Buzzanga, J.; Hodgins, S. Psychological stress and psoriasis: Experimental and prospective correlational studies. *Acta Derm. Venereol. Suppl.* **1991**, *156*, 37–43.
57. Lazaroff, I.; Shimshoni, R. Effects of Medical Resonance Therapy Music on patients with psoriasis and neuro-dermatitis—A pilot study. *Integr. Physiol. Behav. Sci.* **2000**, *35*, 189–198. [[CrossRef](#)]
58. Paradisi, A.; Abeni, D.; Finore, E.; Di Pietro, C.; Sampogna, F.; Mazzanti, C.; Pilla, M.A.; Tabolli, S. Effect of written emotional disclosure interventions in persons with psoriasis undergoing narrow band ultraviolet B phototherapy. *Eur. J. Dermatol.* **2010**, *20*, 599–605. [[CrossRef](#)]
59. Vedhara, K.; Morris, R.M.; Booth, R.; Horgan, M.; Lawrence, M.; Birchall, N. Changes in mood predict disease activity and quality of life in patients with psoriasis following emotional disclosure. *J. Psychosom. Res.* **2007**, *62*, 611–619. [[CrossRef](#)]
60. Tabolli, S.; Naldi, L.; Pagliarello, C.; Sampogna, F.; Di Pietro, C.; Spagnoli, A.; Abeni, D.; The Italian Writing Exercise Study Group. Evaluation of the impact of writing exercises interventions on quality of life in patients with psoriasis undergoing systemic treatments. *Br. J. Dermatol.* **2012**, *167*, 1254–1264. [[CrossRef](#)]
61. Fordham, B.; Griffiths, C.; Bundy, C. A pilot study examining mindfulness-based cognitive therapy in psoriasis. *Psychol. Heal. Med.* **2014**, *20*, 121–127. [[CrossRef](#)]
62. D’Alton, P.; Kinsella, L.; Walsh, O.; Sweeney, C.; Timoney, I.; Lynch, M.; O’Connor, M.; Kirby, B. Mindfulness-Based Interventions for Psoriasis: A Randomized Controlled Trial. *Mindfulness* **2019**, *10*, 288–300. [[CrossRef](#)]
63. Van Beugen, S.; Ferwerda, M.; Koulil, S.S.-V.; Smit, J.V.; Zeeuwen-Franssen, M.E.; Kroft, E.B.; De Jong, E.M.; Otero, M.E.; Donders, A.R.T.; Van De Kerkhof, P.C.; et al. Tailored Therapist-Guided Internet-Based Cognitive Behavioral Treatment for Psoriasis: A Randomized Controlled Trial. *Psychother. Psychosom.* **2016**, *85*, 297–307. [[CrossRef](#)]
64. Koulil, S.; Ferwerda, M.; Beugen, S.; Middendorp, H.; Kerkhof, P.; Riel, P.A.; Evers, A. Tailored Therapist-guided Internet-based Cognitive-behavioural Treatment for Psoriasis and Rheumatoid Arthritis: Two Case Reports. *Acta Derm. Venereol.* **2018**, *98*, 225–233. [[CrossRef](#)]
65. Bundy, C.; Pinder, B.; Bucci, S.; Reeves, D.; Griffiths, C.; Tarrier, N. A novel, web-based, psychological intervention for people with psoriasis: The electronic Targeted Intervention for Psoriasis (eTIPs) study. *Br. J. Dermatol.* **2013**, *169*, 329–336. [[CrossRef](#)]
66. Seng, T.K.; Nee, T.S. Group therapy: A useful and supportive treatment for psoriasis patients. *Int. J. Dermatol.* **1997**, *36*, 110–112. [[CrossRef](#)]
67. Piaserico, S.; Marinello, E.; Dessi, A.; Linder, M.; Cocciarielli, D.; Peserico, A. Efficacy of Biofeedback and Cognitive-behavioural Therapy in Psoriatic Patients: A Single-blind, Randomized and Controlled Study with Added Narrow-band Ultraviolet B Therapy. *Acta Derm. Venereol.* **2014**, *94*, 91–95. [[CrossRef](#)]
68. Goodman, M. An hypothesis explaining the successful treatment of psoriasis with thermal biofeedback: A case report. *Biofeedback Self Regul.* **1994**, *19*, 347–352. [[CrossRef](#)]
69. Hughes, J.E.; Barraclough, B.M.; Hamblin, L.G.; White, J.E. Psychiatric Symptoms in Dermatology Patients. *Br. J. Psychiatry* **1983**, *143*, 51–54. [[CrossRef](#)]
70. Hodak, E.; Gottlieb, A.B.; Segal, T.; Politi, Y.; Maron, L.; Sulkes, J.; David, M. Climatotherapy at the Dead Sea is a remittive therapy for psoriasis: Combined effects on epidermal and immunologic activation. *J. Am. Acad. Dermatol.* **2003**, *49*, 451–457. [[CrossRef](#)]
71. Czarnowicki, T.; Ingber, A.; Ruzicka, T.; Novack, L.; Harari, M. Does Simultaneous Methotrexate Treatment Improve Dead Sea Climatotherapy Outcomes in Plaque Psoriasis? *Psoriasis Forum* **2011**, *17*, 220–224. [[CrossRef](#)]
72. Emmanuel, T.; Lybæk, D.; Johansen, C.; Iversen, L. Effect of Dead Sea Climatotherapy on Psoriasis; A Prospective Cohort Study. *Front. Med.* **2020**, *7*, 83. [[CrossRef](#)]
73. Emmanuel, T.; Lybæk, D.; Johansen, C.; Iversen, L. Non-random Plaque-site Recurrence of Psoriasis in Patients Treated with Dead Sea Climatotherapy. *Acta Derm. Venereol.* **2019**, *99*, 909–910. [[CrossRef](#)]
74. Even-Paz, Z.; Efron, D.; Kipnis, V.; Abels, D. How much Dead Sea sun for psoriasis? *J. Dermatol. Treat.* **1996**, *7*, 17–19. [[CrossRef](#)]

75. Frentz, G.; Olsen, J.; Avrach, W. Malignant tumours and psoriasis: Climatotherapy at the Dead Sea. *Br. J. Dermatol.* **1999**, *141*, 1088–1091. [[CrossRef](#)]
76. Harari, M.; Czarnowicki, T.; Fluss, R.; Ruzicka, T.; Ingber, A. Patients with early-onset psoriasis achieve better results following Dead Sea climatotherapy. *J. Eur. Acad. Dermatol. Venereol.* **2012**, *26*, 554–559. [[CrossRef](#)]
77. Harari, M.; Novack, L.; Barth, J.; David, M.; Friger, M.; Moses, S.W. The percentage of patients achieving PASI 75 after 1 month and remission time after climatotherapy at the Dead Sea. *Int. J. Dermatol.* **2007**, *46*, 1087–1091. [[CrossRef](#)]
78. Harari, M.; Sela, Y.; Ingber, A.; Vardy, D. Dead sea climatotherapy for psoriasis vulgaris: Analysis of short-term results. *Glob. Dermatol.* **2016**, *3*, 295–301. [[CrossRef](#)]
79. Harari, M.; Shani, J. Demographic evaluation of successful antipsoriatic climatotherapy at the Dead Sea (Israel) DMZ Clinic. *Int. J. Dermatol.* **1997**, *36*, 304–308. [[CrossRef](#)]
80. Kushelevsky, A.P.; Harari, M.; Kudish, A.I.; Hristakieva, E.; Ingber, A.; Shani, J. Safety of solar phototherapy at the Dead Sea. *J. Am. Acad. Dermatol.* **1998**, *38*, 447–452. [[CrossRef](#)]
81. Kushelevsky, A. Climatotherapy of Psoriasis and Hypertension in Elderly Patients at the Dead-Sea. *Pharmacol. Res.* **1996**, *34*, 87–91. [[CrossRef](#)]
82. Nissen, J.B.; Avrach, W.W.; Hansen, E.S.; Stengaard-Pedersen, K.; Kragballe, K. Increased levels of enkephalin following natural sunlight (combined with salt water bathing at the Dead Sea) and ultraviolet A irradiation. *Br. J. Dermatol.* **1998**, *139*, 1012–1019. [[CrossRef](#)] [[PubMed](#)]
83. Schewach-Millet, M.; Feinstein, A.; Trau, H.; Abel, E.A.; Cox, A.J. Histologic studies in psoriatic patients treated at the Dead Sea: Comparison with photochemotherapy. *J. Am. Acad. Dermatol.* **1989**, *20*, 502–503. [[CrossRef](#)]
84. Trøstrup, H.; Riis, P.T.; Heidenheim, M.; Bryld, L.E.; Jemec, G.B. Long-term evaluation of climatotherapy for psoriasis. *Dermatol. Ther.* **2020**, *33*, e13432. [[CrossRef](#)]
85. Bogdanov, I.; Kircheva, K.; Miteva, L.; Tsankov, N. Quality of life in patients undergoing combined climatotherapy and phototherapy. *Rev. Med. Română* **2012**, *59*, 251–254.
86. Golusin, Z.; Jovanovic, M.; Magda, N.; Stojanovic, S.; Matic, M.; Petrovic, A. Effects of Rusanda Spa balneotherapy combined with calcipotriol on plaque psoriasis. *Vojn. Pregl.* **2015**, *72*, 1010–1017. [[CrossRef](#)]
87. Peroni, A.; Gisondi, P.; Zanoni, M.; Girolomoni, G. Balneotherapy for chronic plaque psoriasis at Comano spa in Trentino, Italy. *Dermatol. Ther.* **2008**, *21* (Suppl. 1), S31–S38. [[CrossRef](#)] [[PubMed](#)]
88. Péter, I.; Jagiczka, A.; Ajtay, Z.; Boncz, I.; Kiss, I.; Szendi, K.; Kustán, P.; Németh, B. Balneotherapy in Psoriasis Rehabilitation. *In Vivo* **2017**, *31*, 1163–1168. [[CrossRef](#)]
89. Tabolli, S.; Calza, A.; Di Pietro, C.; Sampogna, F.; Abeni, D. Quality of Life of Psoriasis Patients before and after Balneo- or Balneophototherapy. *Yonsei Med. J.* **2009**, *50*, 215–221. [[CrossRef](#)]
90. Nilsen, L.T.N.; Søyland, E.; Krogstad, A.L. Estimated ultraviolet doses to psoriasis patients during climate therapy. *Photodermatol. Photoimmunol. Photomed.* **2009**, *25*, 202–208. [[CrossRef](#)]
91. Martin, R.; Henley, J.B.; Sarrazin, P.; Seité, S. Skin Microbiome in Patients with Psoriasis Before and After Balneo-therapy at the Thermal Care Center of La Roche-Posay. *J. Drugs Dermatol.* **2015**, *14*, 1400–1405.
92. Pinton, J.; Friden, H.; Kettaneh-Wold, N.; Wold, S.; Dreno, B.; Richard, A.; Bieber, T. Clinical and biological effects of balneotherapy with selenium-rich spa water in patients with psoriasis vulgaris. *Br. J. Dermatol.* **1995**, *133*, 344–347. [[CrossRef](#)]
93. Wang, G.; Bai, F.; Tian, Z.; Fan, L.; Lei, M. Balneotherapy with Chinese herbal medicine prolongs the remission period in patients with psoriasis vulgaris. *Dermatol. Ther.* **2020**, *33*, e13351. [[CrossRef](#)]
94. Tsourelis-Nikita, E.; Menchini, G.; Ghersetich, I.; Hercogova, J. Alternative treatment of psoriasis with balneotherapy using Leopoldine spa water. *J. Eur. Acad. Dermatol. Venereol.* **2002**, *16*, 260–262. [[CrossRef](#)]
95. Melandri, D.; Albano, V.M.; Venturi, M.; Flamigni, A.; Vairetti, M. Efficacy of combined liman peloid baths and heliotherapy in the treatment of psoriasis at Cervia spa, Emilia, Italy. *Int. J. Biometeorol.* **2020**, *64*, 1145–1152. [[CrossRef](#)]
96. Wang, Y.; Fu, Y.; Zhang, L.; Fu, J.; Li, B.; Zhao, L.; Di, T.; Meng, Y.; Li, N.; Guo, J.; et al. Acupuncture Needling, Electroacupuncture, and Fire Needling Improve Imiquimod-Induced Psoriasis-Like Skin Lesions through Reducing Local Inflammatory Responses. *Evid. Based Complement. Altern. Med.* **2019**, *2019*, 4706865. [[CrossRef](#)]
97. Chen, Z.; Zhou, D.; Wang, Y.; Lan, H.; Duan, X.; Li, B.; Zhao, J.; Li, W.; Liu, Z.; Di, T.; et al. Fire needle acupuncture or moxibustion for chronic plaque psoriasis: Study protocol for a randomized controlled trial. *Trials* **2019**, *20*, 1–11. [[CrossRef](#)]
98. Koo, J.; Desai, R. Traditional Chinese medicine in dermatology. *Dermatol. Ther.* **2003**, *16*, 98–105. [[CrossRef](#)]
99. Yeh, M.-L.; Ko, S.-H.; Wang, M.-H.; Chi, C.-C.; Chung, Y.-C. Acupuncture-Related Techniques for Psoriasis: A Systematic Review with Pairwise and Network Meta-Analyses of Randomized Controlled Trials. *J. Altern. Complement. Med.* **2017**, *23*, 930–940. [[CrossRef](#)]
100. Xiao, S.; Li, B.; Feng, S.; Liu, C.; Zhang, G. Acupuncture combined with herbal medicine versus herbal medicine alone for plaque psoriasis: A systematic review protocol. *Ann. Transl. Med.* **2019**, *7*, 115. [[CrossRef](#)]
101. Sanchez, D.P.; Sonthalia, S. Koebner Phenomenon. In *StatPearls*; StatPearls Publishing: Treasure Island, FL, USA, 2021.
102. Deng, J.; Lu, C.; Xiang, Y.; Deng, H.; Wen, Z.; Yao, D.; Xuan, M.; Yan, Y. Auricular acupressure as a complementary therapy for psoriasis vulgaris: Study protocol for a multicenter randomized controlled trial. *Trials* **2019**, *20*, 358. [[CrossRef](#)]
103. Xing, M.; Yan, X.; Yang, S.; Li, L.; Gong, L.; Liu, H.; Xu, R.; Chen, J.; Ying, L.; Zhao, Y.; et al. Effects of moving cupping therapy for plaque psoriasis: Study protocol for a randomized multicenter clinical trial. *Trials* **2020**, *21*, 229. [[CrossRef](#)]

104. Lowe, D.T. Cupping therapy: An analysis of the effects of suction on skin and the possible influence on human health. *Complement. Ther. Clin. Pract.* **2017**, *29*, 162–168. [[CrossRef](#)]
105. Lee, H.Y.; Lee, H.J.; Kim, G.C.; Choi, J.H.; Hong, J.W. Plasma cupping induces VEGF expression in skin cells through nitric oxide-mediated activation of hypoxia inducible factor 1. *Sci. Rep.* **2019**, *9*, 3821. [[CrossRef](#)]
106. Mehta, P.; Dhapte, V. Cupping therapy: A prudent remedy for a plethora of medical ailments. *J. Tradit. Complement. Med.* **2015**, *5*, 127–134. [[CrossRef](#)]
107. Xing, M.; Ding, X.; Zhang, J.; Kuai, L.; Ru, Y.; Sun, X.; Ma, T.; Miao, X.; Liu, L.; Wang, Y.; et al. Moving cupping therapy for plaque psoriasis: A PRISMA-compliant study of 16 randomized controlled trials. *Medicine* **2020**, *99*, e22539. [[CrossRef](#)]
108. Basavaraj, K.H.; Navya, M.A.; Rashmi, R. Stress and quality of life in psoriasis: An update. *Int. J. Dermatol.* **2011**, *50*, 783–792. [[CrossRef](#)]
109. Shenefelt, P.D. Hypnosis in Dermatology. *Arch. Dermatol.* **2000**, *136*, 393–399. [[CrossRef](#)]
110. Capella, G.L.; Finzi, A.F. Complementary therapy for psoriasis. *Dermatol. Ther.* **2003**, *16*, 164–174. [[CrossRef](#)] [[PubMed](#)]
111. Cohen, A.; Shapiro, J.; Michael, D.; Hodak, E.; Van-Dijk, D.; Naggan, L.; Vardy, D. Outcome of “Short-term” Dead Sea Climatotherapy for Psoriasis. *Acta Derm. Venereol.* **2008**, *88*, 90–91. [[CrossRef](#)]