

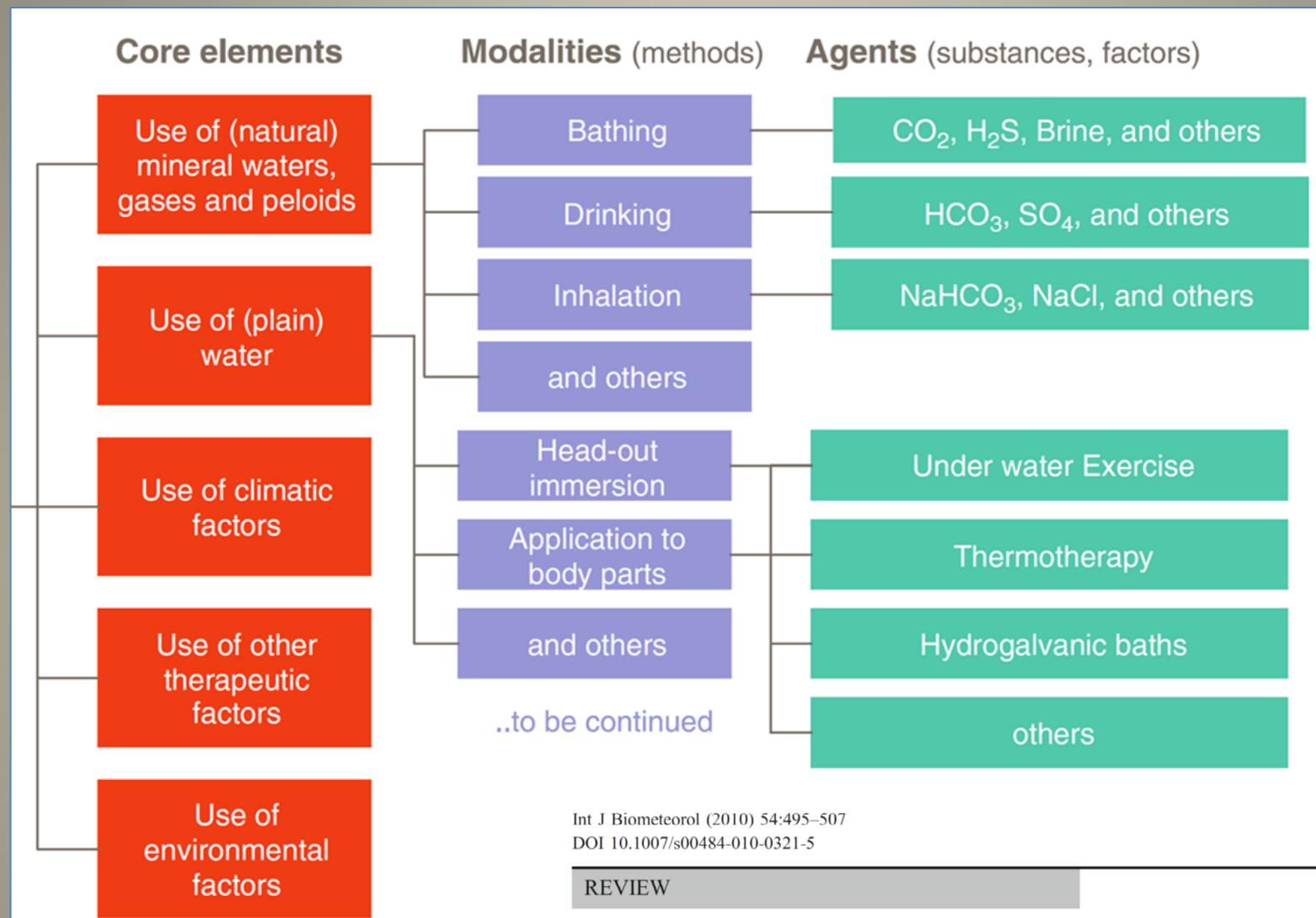


**POLSKIE TOWARZYSTWO
BALNEOLOGII
I MEDYCYNY FIZYKALNEJ**

Medical Balneology; recent global developments

Müfit Zeki Karagülle, MD, PhD

**XXV (XXIX) Zjazd Balneologiczny
Balneological Congress of the Polish Association of
Balneology and Physical Medicine
10-13 September 2015, Polańczyk**



Int J Biometeorol (2010) 54:495–507
DOI 10.1007/s00484-010-0321-5

REVIEW

A proposal for a worldwide definition of health resort medicine, balneology, medical hydrology and climatology

Christoph Gutenbrunner • Tamas Bender •
Pedro Cantista • Zeki Karagülle

Balneology/ISMH goes global



40TH ISMH WORLD CONGRESS
40° CONGRESSO MUNDIAL DA ISMH
24TH BRAZILIAN CONGRESS OF MINERAL
WATER INDUSTRY & EXPO-ABINAM'2015
24° CONGRESSO BRASILEIRO DA INDÚSTRIA
DE ÁGUAS MINERAIS & EXPO-ABINAM'2015
4TH BRAZILIAN SYMPOSIUM OF CRENOLOGY AND MEDICAL HYDROLOGY
4º SIMPÓSIO BRASILEIRO DE CRENOLOGIA E HIDROLOGIA MÉDICA
26 - 28 August - Rio de Janeiro - Brazil
De 26 a 28 de Agosto - Rio de Janeiro - Brasil

Adding value through
Medical Hydrology
Agregando valor por meio
da Hidrologia Médica

ORGANIZAÇÃO E REALIZAÇÃO
ORGANIZATION AND IMPLEMENTATION

LOCAL DO EVENTO / HOTEL OFICIAL
EVENT VENUE / OFFICIAL HOTEL

WINDSOR BARRA

The poster features a collage of images including the Christ the Redeemer statue, a woman in a hot spring, a cable car, and a glass of mineral water. The bottom section includes logos for ISMH, ABINAM, and Windsor Barra, along with the event's official hotel.

Intensified and enriched global scientific research in Balneology

- Balneological articles published in peer reviewed international journals has been continually increasing since last decade
- The authors from countries like Brazil, Japan, China, Taiwan, South Korea and India are publishing more in addition to classical European balneological countries like France, Italy, Spain, Germany, Austria
- The contribution to this development from eastern European countries like Poland, Romania, Bulgaria, Greece, Serbia and Turkey is also increasing.

Research methodology; better quality

Clin Rheumatol (2015) 34:207–214

DOI 10.1007/s10067-014-2845-2

REVIEW ARTICLE

Effectiveness of balneotherapy and spa therapy for the treatment of chronic low back pain: a review on latest evidence

Mine Karagülle • Müfit Zeki Karagülle

We comprehensively searched data bases for randomized controlled trials (RCTs) published in English between July 2005 and December 2013.

By using JADAD calculation we evaluated also the quality of the RCTs evaluating balneotherapy and spa therapy for the treatment of low back.

Randomized controlled trials Jadad scores, journals and impact factors

Author, (year) treatment	Journal	Jadad quality score	Journal impact factor
Balogh et al. (2005) Balneotherapy	<i>ForschendeKomplementärmedizin/Research in Complementary Medicine</i>	1	1,279
Leibetseder et al. (2007) Spa therapy	<i>ForschendeKomplementärmedizin/Research in Complementary Medicine</i>	0	1,279
Demirel et al. (2008) Spa therapy	<i>Journal of Back and Musculoskeletal Rehabilitation</i>	2	0,613
Kulisch et al. (2009) Spa therapy	<i>Journal of Rehabilitation Medicine</i>	5	2,134
Doğan et al. (2011) Spa therapy	<i>Southern Medical Journal</i>	1	0,915
Kesiktaş et al. (2012) Spa therapy	<i>Rheumatology International</i>	3	2,214
Tefner et al. (2012) Balneotherapy	<i>Rheumatology International</i>	3	2,214
Gremeaux et al. (2013) Spa therapy	<i>Joint Bone Spine</i>	2	2,748

Research methodology in Balneology; better quality

- Most recent trials seem to be having higher quality probably reflecting the increased awareness and knowledge in methodology of RCTs evaluating balneotherapy and spa therapy

Clin Rheumatol (2015) 34:207–214

DOI 10.1007/s10067-014-2845-2

REVIEW ARTICLE

Effectiveness of balneotherapy and spa therapy for the treatment of chronic low back pain: a review on latest evidence

Mine Karagülle • Müfit Zeki Karagülle

Research methodology; better quality

Balneotherapy for Patients with Fibromyalgia, the Evidence

Olga Surdu^{1,2}, Traian Virgiliu Surdu¹, Monica Surdu³

¹Ovidius University of Constanța, 124, Mamaia Blv, Constanța, Romania

²Balneal and Rehabilitation Sanatorium of Techirghiol, Romania

³Emergency Clinical Hospital of Constanța, Tomis Blv, Constanța, Romania

We realized a review of the literature regarding balneotherapy in the treatment of the fibromyalgia. We searched *databases*: PubMed, Medline, Cochrane Library, Web of Science for abstracts and articles published in the last ten years, from 2004 to September 2013 using *keywords*: fibro-

SUMMARY

Introduction. There is popular belief that balneotherapy is effective in the treatment of musculoskeletal conditions as fibromyalgia.

Objectives. The paper work is a review of randomised controlled trials on balneotherapy applied for fibromyalgia in terms of: interventions, available statistic evidence, outcomes, follow up and studies' quality, published in the last ten years.

Methods. We searched databases (PubMed, Medline, Cochrane Library, Web of Science) for abstract and articles published between 2004 and September 2013. After applying inclusion and exclusion criteria we selected eight studies having 487 patients from which 245 for treatment and 242 for control group. For the quality assessment of the studies we used the Van Tulen scale.

Results. We found evidence that balneotherapy group showed statistically significant improvement of outcomes measured: pain, tender points count, fibromyalgia impact questionnaire, Beck depression inventory and other. Control group do not presented such improvements.

Conclusions. Quality of study we analysed was good and levels of evidence (IIa, IIb) indicate the efficacy and effectiveness of balneotherapy applied in fibromyalgia. Strengh of recommandation is class B and C.

Key words: fibromyalgia, balneotherapy, spa therapy, hydrotherapy; randomized controlled/clinical trial

Research methodology; better quality

Olga Surdu et al.

Table 5. Van Tulder score and quality of articles reviewed.

First author	Study	Van Tulder score /19 items	Quality assessed
Ozkurt S, et al	Balneotherapy in fibromyalgia: a single blind randomized controlled clinical study	11/19	Good
Dönmez A, et al	SPA therapy in fibromyalgia: a randomised controlled clinic study	14/19	High
Kesiktaş N, et al	The efficacy of balneotherapy and physical modalities (. . . .)	11/19	Good
Fioravanti A, et al	Effects of mud-bath treatment on fibromyalgia patients: a randomized clinical trial	11/19	Good
Ardıç F, et al	Effects of balneotherapy on serum IL-1, PGE2 and LTB4 levels in fibromyalgia patients	9/19	moderate
Altan L, and al	Investigation of the effects of pool-based exercise on fibromyalgia syndrome	10/19	Good
Evcik D, et al	Effectiveness of aquatic therapy in the treatment of fibromyalgia syndrome (.)	13/19	Good
Zijlstra TR, et al	Spa treatment for primary fibromyalgia syndrome: (.)	12/19	Good

Balneotherapy remains a therapeutic approach difficult to evaluate due to mathematical constraints required for statistical analysis that must not be over-estimated.

Research methodology; better quality

Balneotherapy (or spa therapy) for rheumatoid arthritis (Review)

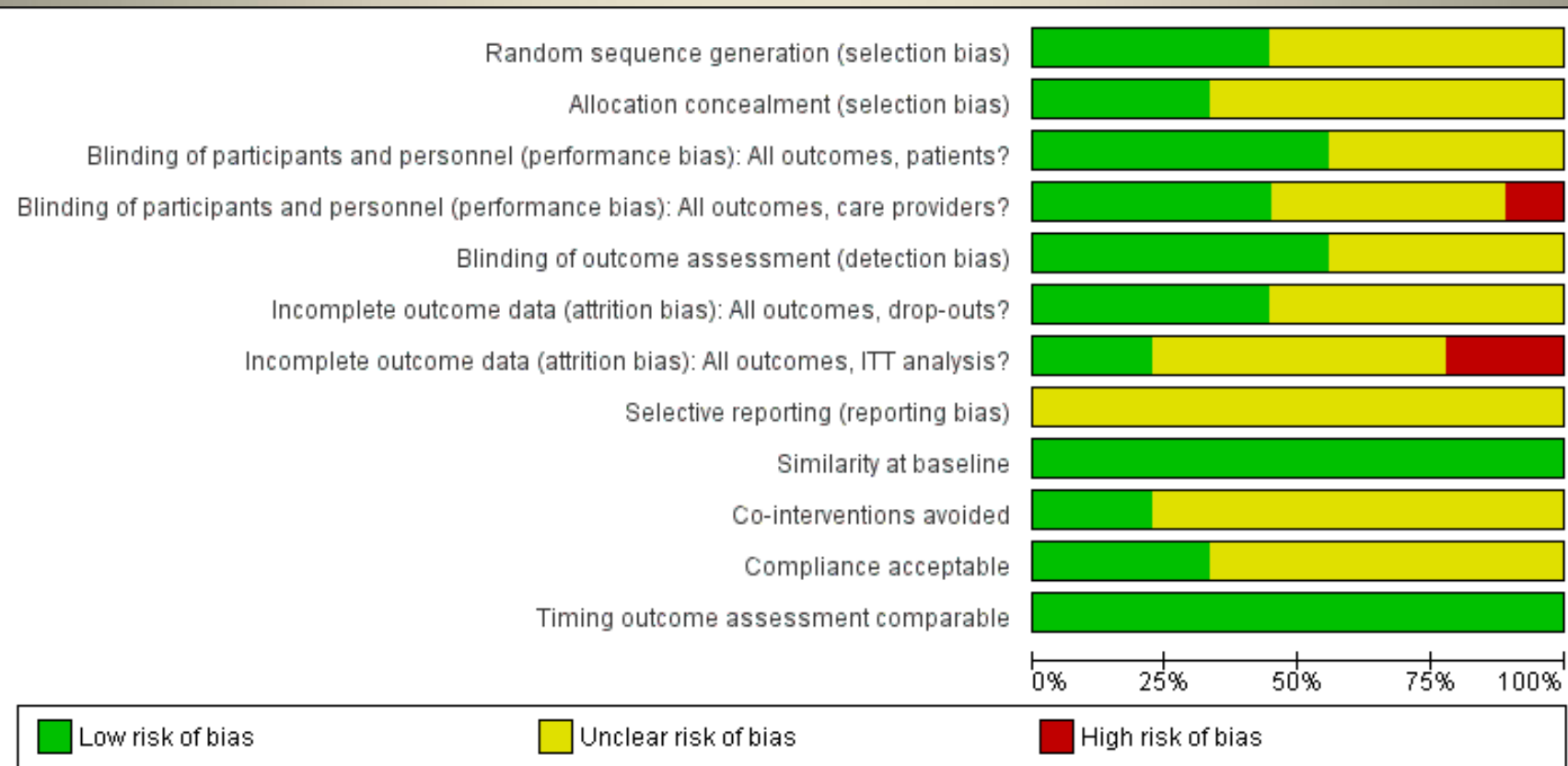
Verhagen AP, Bierma-Zeinstra SMA, Boers M, Cardoso JR, Lambeck J, de Bie R, de Vet HCW



We reviewed the evidence on the benefits and harms of balneotherapy (natural mineral waters, gases and mudpacks or spa therapy) in people with rheumatoid arthritis.

Balneotherapy is defined as bathing in natural mineral or thermal waters (e.g. mineral baths, sulphur baths, Dead Sea baths), using mudpacks or doing both. Upon searching for all relevant studies up to December 2014, we found nine studies with 579 people.

Research methodology; better quality



Unfortunately, most studies showed methodological flaws resulting in high risk of bias.

When information concerning trial design, especially regarding strategies to avoid bias, is lacking, we could not exclude possible bias in the trial.

Research methodology; need for better quality

Quality of the evidence

The quality of the evidence is very low mainly because of the low number of participants in the studies and concerns about study designs.

Therefore, a robust analysis of the effectiveness of balneotherapy cannot be presented.

Authors' conclusions:

Overall evidence is insufficient to show that balneotherapy is more effective than no treatment, that one type of bath is more effective than another or that one type of bath is more effective than mudpacks, exercise or relaxation therapy.

Research methodology; better quality

Complementary Therapies in Medicine (2013) 21, 324–332



Available online at www.sciencedirect.com

SciVerse ScienceDirect

journal homepage: www.elsevierhealth.com/journals/ctim



A checklist to assess the quality of reports on spa therapy and balneotherapy trials was developed using the Delphi consensus method: The SPAC checklist

Hiroharu Kamioka^{a,*}, Yoichi Kawamura^b, Kiichiro Tsutani^c, Masaharu Maeda^d, Shinya Hayasaka^e, Hiroyasu Okuizum^f, Shinpei Okada^g, Takuya Honda^h, Yuichi Iijimaⁱ

to assess the quality
of reports on spa
therapy and
balneotherapy trials
(The SPAC checklist)

Complementary Therapies in Clinical Practice 20 (2014) 317–333



Contents lists available at ScienceDirect

Complementary Therapies in Clinical Practice

journal homepage: www.elsevier.com/locate/ctcp

Assessing the quality of study reports on spa therapy based on randomized controlled trials by the spa therapy checklist (SPAC)

Hiroharu Kamioka^{a,*}, Kiichiro Tsutani^b, Masaharu Maeda^c, Shinya Hayasaka^d, Hiroyasu Okuizum^e, Yasuaki Goto^f, Shinpei Okada^g, Jun Kitayuguchi^h, Takafumi Abe^h

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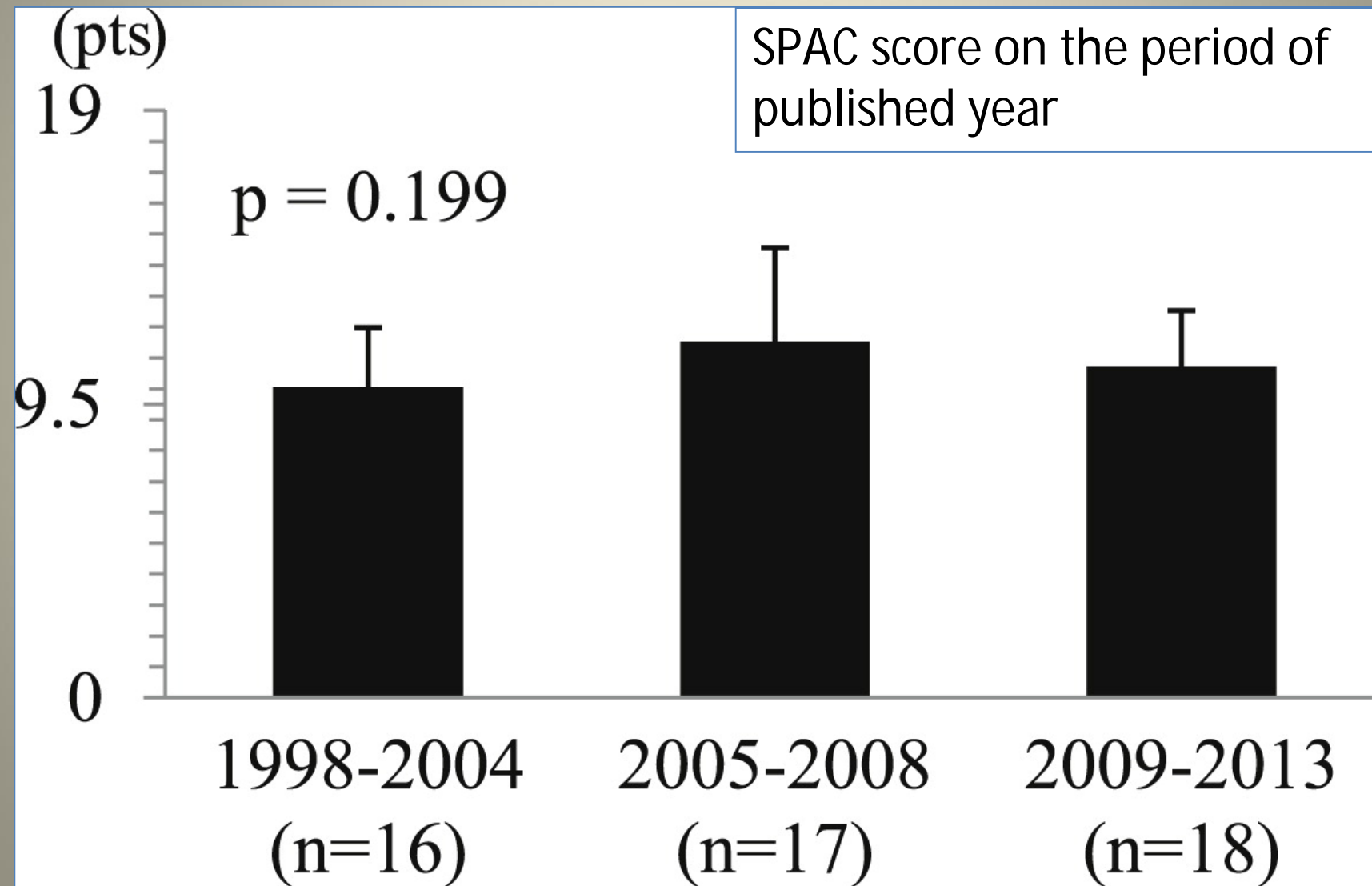
^e Mimaki Onsen (Spa) Clinic, Tomi City, Japan

^f Japan Health and Research Institute, Japan

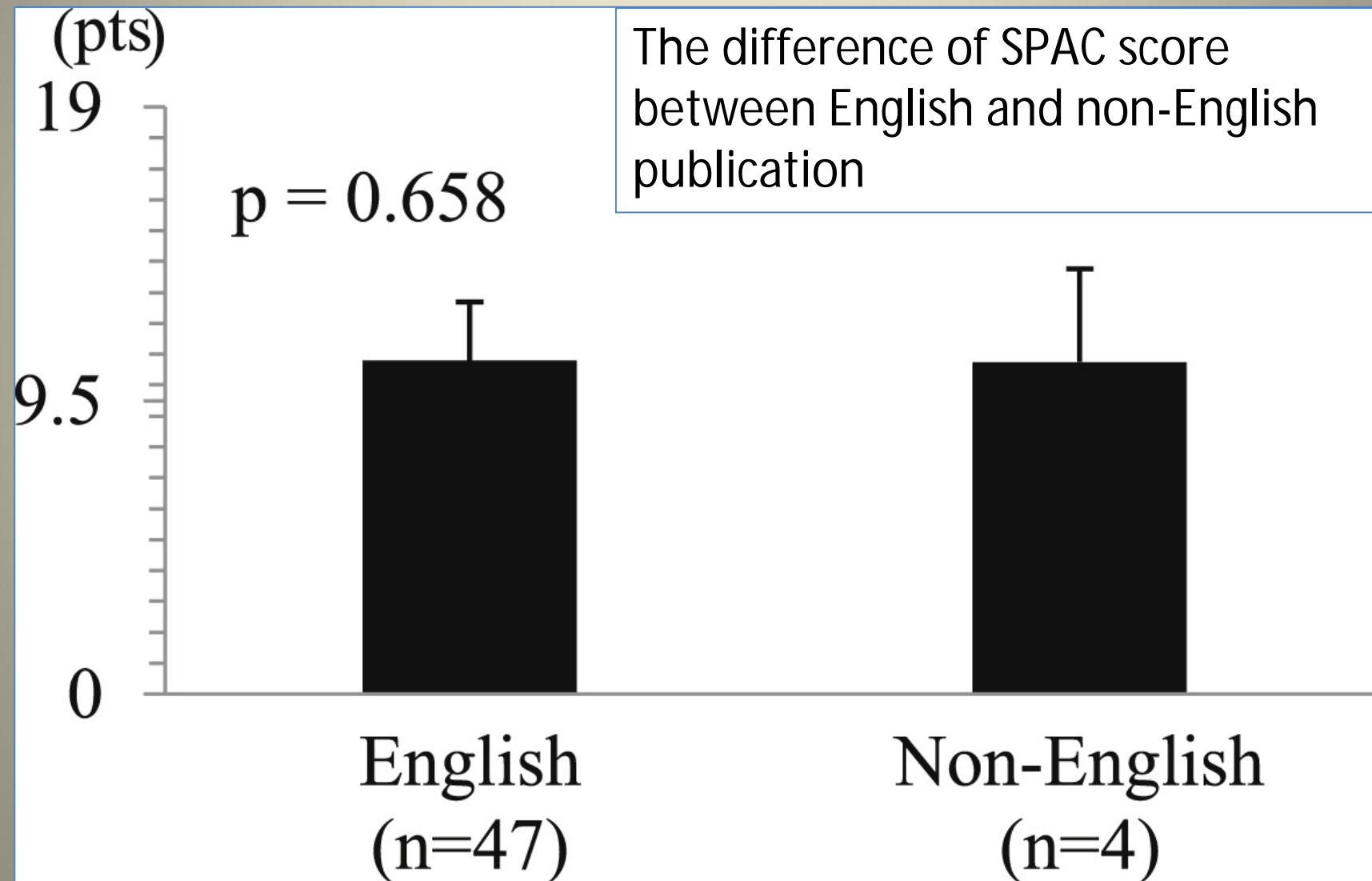
^g Physical Education and Medicine Research Foundation, Japan

^h Physical Education and Medicine Research Center Unnan, Japan

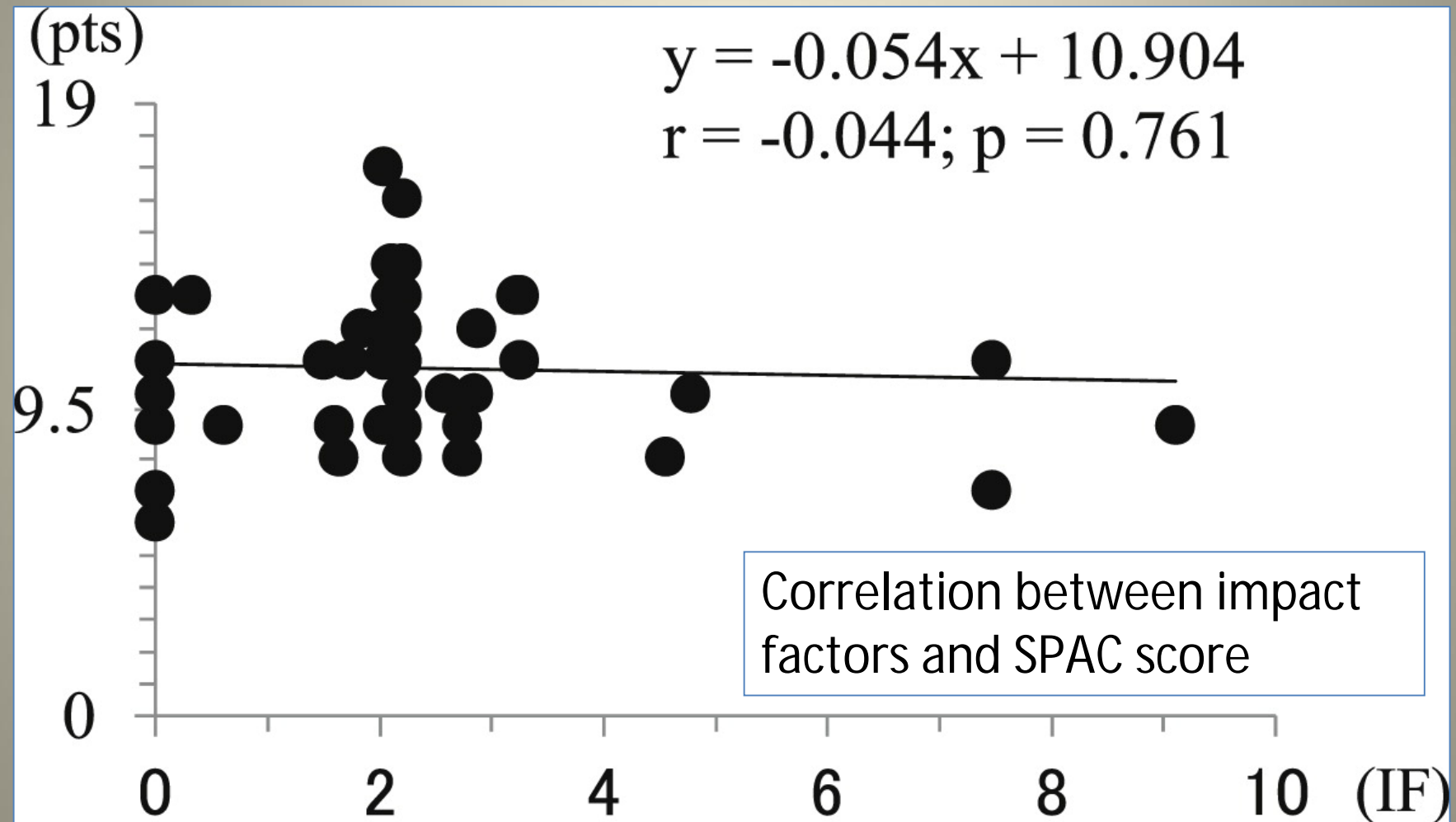
Research methodology; better quality



Research methodology; better quality



Research methodology; better quality



for better quality (very poor; <50%) (present ratio; %):

- Locations of spa facility where the data were collected (location and surrounding environment) (45%)
- Instructions about daily life (the same as usual, increase the step number a day as much as possible, etc.) (43%)
- Adherence (the frequency and rate of actual implementation) (33%).
- Qualification of care provider (specialist in balneotherapy, related experts and health fitness programmer, etc.) (33%)
- pH of water (27%);
- Existence of other exposure than bathing (sauna, steam bath, etc.) (25%);
- Scale of bathtub (8%);
- Presence of facility (if any, the property; e.g., comfortable resting room) (8%)
- Experience of care provider (0%);

• The SPAC score (full-mark; 19 pts) was 10.8 ± 2.3 pts and the rate was $56.6\% \pm 12.2\%$ (mean \pm SD) in total.

Implications for better quality

- Large studies with low risk of bias are needed, focusing on appropriate allocation concealment, blinding and adequate data presentation and analysis.
- The design and reporting of future trials should conform to CONSORT guidelines and the SPAC Checklist.
- New research should at a minimum use the agreed upon core set of outcome measures for each disease supplemented with further specific measures relevant to capture the patient experience, documented to be adequate with the patient responsive to the balneotherapy or spa therapy under study.
- Follow-up should be of sufficient length (up to a year) to assess long-term effects.

Implications for better quality


- The study report should provide full data on outcome measures, including mean and standard deviation or 95% confidence interval.
- Future research should examine the effects of balneotherapy or spa therapy not only in pragmatic trials comparing various interventions with each other, but also in more explanatory trials comparing intervention groups versus a no-treatment control group.

Balneological interventions other than balneotherapy; more research

- Drinking cures, and inhalations are also being increasingly evaluated for efficacy in various disease and conditions

Drinking cures!
Hyperlipidemia

APB *Advanced Pharmaceutical Bulletin*, 2014, 4(3), 303-307
doi: <http://dx.doi.org/10.5681/apb.2014.044>
<http://apb.tbzmed.ac.ir/>



Hypolipidemic Activity of a Natural Mineral Water Rich in Calcium, Magnesium, and Bicarbonate in Hyperlipidemic Adults

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² Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran.
³ Faculty of Pharmacy, Tabriz University of Medical Sciences, Tabriz, Iran.
⁴ Students' Research Committee, Faculty of Pharmacy, Tabriz University of Medical Sciences, Tabriz, Iran.
⁵ Drug Applied Research Center, Tabriz University of Medical Sciences, Tabriz, Iran.

ARTICLE INFO	ABSTRACT
Article Type: Research Article	Purpose: This study compared the effects of a mineral water rich in calcium, magnesium, bicarbonate, and sulfate and a marketed mineral water with a composition similar to that of urban water on the lipid profile of dyslipidemic adults.
Article History: Received: 20 July 2013 Revised: 1 January 2014 Accepted: 1 January 2014 Published: 1 February 2014	Methods: In a randomized controlled trial, 32 adults received one liter of "rich mineral water" daily for one month, and 37 adults drank the same amount of normal mineral water for the same period. Changes in lipid profiles were compared separately in each studied group at the end of one month.
	Results: Results showed that mean cholesterol and low density lipoprotein LDL levels were significantly decreased in both studied groups after one month of drinking mineral water ($P < 0.05$); however, no significant differences in high density lipoprotein (HDL) and triglyceride (TG) levels were seen in either group one month after drinking. There were no statistically significant differences between the "rich mineral water" and the normal mineral water groups in any of the above-mentioned lipid levels ($P > 0.05$).
	Conclusion: A one-month intake of mineral water rich in calcium, magnesium bicarbonate, and sulfate decreased cholesterol and LDL levels but not TG or HDL levels in dyslipidemic adults.

Balneological interventions other than balneotherapy; more research

Hindawi Publishing Corporation
The Scientific World Journal
Volume 2013, Article ID 927835, 7 pages
<http://dx.doi.org/10.1155/2013/927835>

Inhalations ! ENT and
Pulmonary conditions



Clinical Study

Reducing Agents Decrease the Oxidative Burst and Improve Clinical Outcomes in COPD Patients: A Randomised Controlled Trial on the Effects of Sulphurous Thermal Water Inhalation

**Marco Contoli,¹ Giulia Gnesini,¹ Giacomo Forini,¹ Brunilda Marku,¹
Alessia Pauletti,¹ Anna Padovani,¹ Paolo Casolari,¹ Liliana Taurino,¹ Andrea Ferraro,¹
Milva Chicca,² Adalberto Ciaccia,¹ Alberto Papi,¹ and Silvano Pinamonti²**

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² Department of Life Science and Biotechnology, University of Ferrara, Via Savonarola 9, 44121 Ferrara, Italy

Aiming to test other balneological interventions; Inhalations

Hindawi Publishing Corporation
Journal of Allergy
Volume 2014, Article ID 943824, 17 pages
<http://dx.doi.org/10.1155/2014/943824>

First Systematic Review
and Meta-Analysis



Review Article

Thermal Water Applications in the Treatment of Upper Respiratory Tract Diseases: A Systematic Review and Meta-Analysis

Sarah Keller, Volker König, and Ralph Mösges

Institute of Medical Statistics, Informatics and Epidemiology (IMSIE), University Hospital of Cologne, 50924 Cologne, Germany

Climate therapy; first systematic reviews

Sleep Breath (2014) 18:195–206
DOI 10.1007/s11325-013-0870-z

ORIGINAL ARTICLE

Does climate therapy at moderate altitudes improve pulmonary function in asthma patients? A systematic review

Tanja Massimo • Cornelia Blank • Barbara Strasser •
Wolfgang Schobersberger

Allergy EUROPEAN JOURNAL OF ALLERGY
AND CLINICAL IMMUNOLOGY



Allergy

REVIEW ARTICLE

Alpine climate treatment of atopic dermatitis: a systematic review

K. B. Fieten^{1,2}, A. C. G. Weststrate¹, E. J. van Zuuren³, C. A. Bruijnzeel-Koomen¹ &
S. G. M. A. Pasmans^{1,4}

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To cite this article: Fieten KB, Weststrate ACG, van Zuuren EJ, Bruijnzeel-Koomen CA, Pasmans SGMA. Alpine climate treatment of atopic dermatitis: a systematic review. *Allergy* 2015; **70**: 12–25.

Climatotherapy; Speleotherapy, Halotherapy

Journal of Medicine and Life Volume 7, Special Issue 2, 2014

Speleotherapy – modern bio-medical perspectives

Lăzărescu H, Simionca I, Hoteteu M, Mirescu L

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International Journal of COPD

Dovepress

and medical research

International Journal of COPD 2014;9 239–246

 Open Access Full Text Article

REVIEW

A review of halotherapy for chronic obstructive pulmonary disease

Rachael Rashleigh¹
Sheree MS Smith^{1,2}
Nicola J Roberts³

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University Research Group, School
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Health Research, School of Health
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University, Glasgow, Scotland

Climatotherapy; Forest Bathing

Int. J. Environ. Res. Public Health **2015**, *12*, 2532–2542; doi:10.3390/ijerph120302532

OPEN ACCESS

International Journal of
Environmental Research and
Public Health
ISSN 1660-4601
www.mdpi.com/journal/ijerph

Communication

Physiological and Psychological Effects of Forest Therapy on Middle-Aged Males with High-Normal Blood Pressure

Hiroko Ochiai ^{1,†}, Harumi Ikei ^{2,†}, Chorong Song ^{2,†}, Maiko Kobayashi ³, Ako Takamatsu ⁴, Takashi Miura ⁵, Takahide Kagawa ⁶, Qing Li ³, Shigeyoshi Kumeda ⁷, Michiko Imai ⁸ and Yoshifumi Miyazaki ^{2,*}

Journal of Cardiology 60 (2012) 495–502



ELSEVIER

Contents lists available at SciVerse ScienceDirect

Journal of Cardiology

journal homepage: www.elsevier.com/locate/jjcc



Original article

Therapeutic effect of forest bathing on human hypertension in the elderly

Gen-Xiang Mao (MD)^a, Yong-Bao Cao (MB)^{a,1}, Xiao-Guang Lan (BA)^b, Zhi-Hua He (BA)^b, Zhuo-Mei Chen (PhD)^c, Ya-Zhen Wang (MM)^a, Xi-Lian Hu (PhD)^a, Yuan-Dong Lv (MB)^a, Guo-Fu Wang (PhD)^{a,*}, Jing Yan (MM)^{a,*}

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^b Forestry Department of Zhejiang Province, Hangzhou 310020, Zhejiang Province, P.R. China

^c Zhejiang Forestry Academy, Hangzhou 310023, Zhejiang Province, P.R. China

Balneotherapy and spa therapy in treatment guidelines

Balneotherapy and spa therapy have been included in the recent evidence based treatment guidelines for rheumatic diseases;

- Osteoarthritis
- Fibromyalgia
- Ankylosing spondylitis
- Early rheumatoid arthritis
- Low back pain

Balneotherapy and spa therapy in the most recent treatment guideline

Osteoarthritis and Cartilage 22 (2014) 363–388

Osteoarthritis and Cartilage



OARSI guidelines for the non-surgical management of knee
osteoarthritis



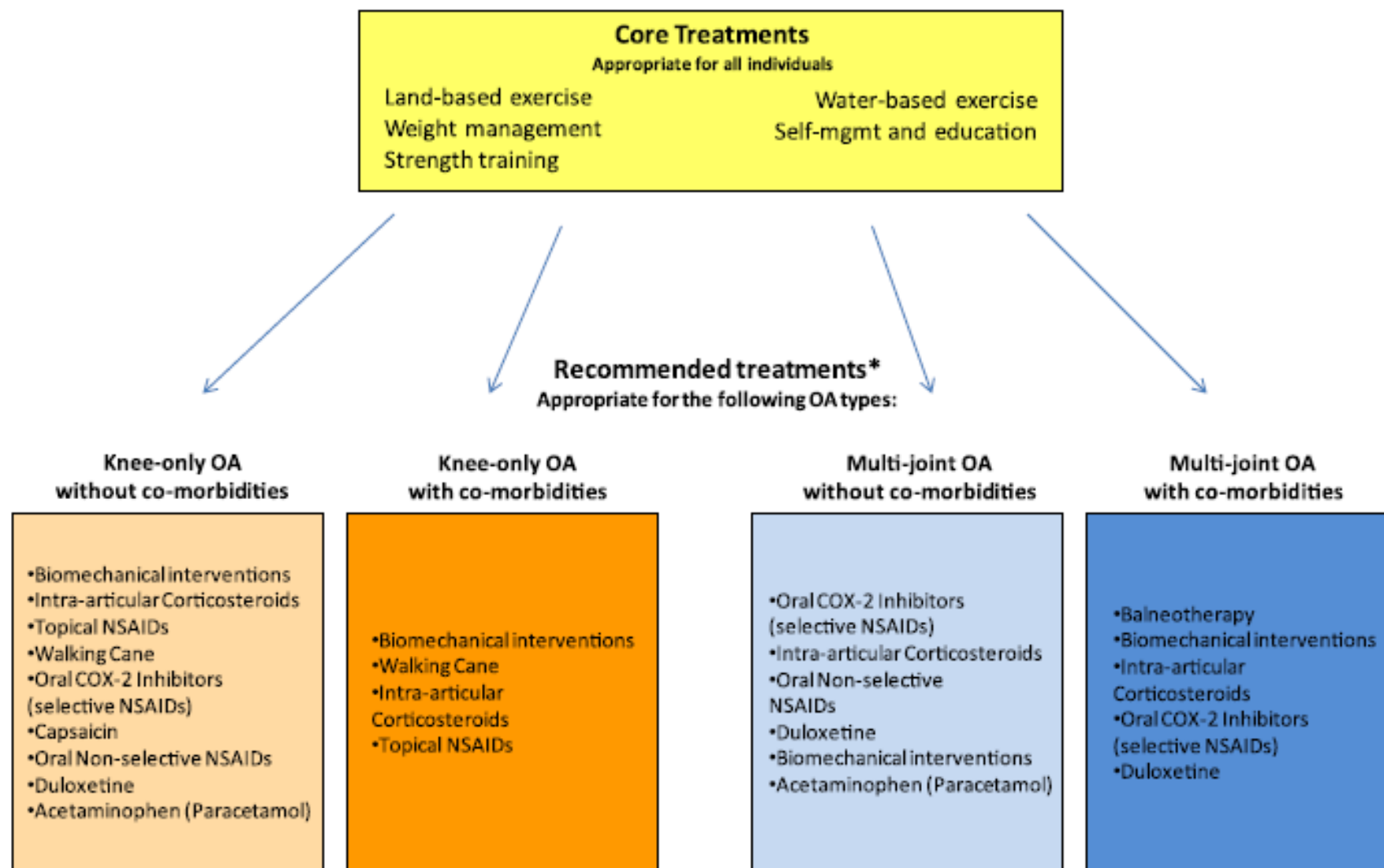
T.E. McAlindon†*, R.R. Bannuru†, M.C. Sullivan†, N.K. Arden‡, F. Berenbaum§||,
S.M. Bierma-Zeinstra¶, G.A. Hawker#, Y. Henrotin††‡‡, D.J. Hunter§§, H. Kawaguchi|||,
K. Kwok¶¶, S. Lohmander##, F. Rannou†††, E.M. Roos†††, M. Underwood§§§

Balneotherapy/spa therapy

Recommendation:

- **Appropriate:** individuals with multiple-joint OA and relevant co-morbidities
- **Uncertain:** individuals without relevant co-morbidities
- **Uncertain:** individuals with knee-only OA

OARSI Guidelines for the Non-surgical Management of Knee OA



Balneotherapy and Spa therapy; Preventive tools?

- Hypertension
- Metabolic syndrome
- Diabetes
- Overweight/obesity
- Cognitive decline

Balneotherapy and peloidotherapy for Hypertension ?

Hypertension

European Review for Medical and Pharmacological Sciences

2014; 18: 2544-2550

Cardiovascular adaptation to mudpack therapy in hypertensive subjects treated with different antihypertensive drugs

G. MERATI^{1,2}, L. AGNELLO^{1,2}, S. RAMPICHINI¹, M.A. MAGGIONI¹,
R. SCURATI¹, A. VEICSTEINAS^{1,2}

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²Centre of Sport Medicine, Don Gnocchi Foundation, Milan, Italy

ORIGINAL RESEARCH

The Effects of Balneotherapy on Blood Pressure and Pulse in Osteoarthritis Patients With Hypertension

Ebru Umay, MD; Mustafa Kemal Tezelli, MD; Mehmet Meshur, MD; Serkan Umay, MD

ALTERNATIVE THERAPIES, NOV/DEC 2013, VOL. 19, 6

Balneotherapy and Spa therapy; Preventive tools?

BALNEOTHERAPY

Thérapie 2013 Mai-Juin; 68 (3): 163–167
DOI: [10.2515/therapie/2013025](https://doi.org/10.2515/therapie/2013025)

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Observation of the Long-term Effects of Lifestyle Intervention during Balneotherapy in Metabolic Syndrome

*Henri Gin^{1,2}, Jean-Louis Demeaux¹, Angela Grelaud^{1,3}, Adeline Grolleau^{1,3}, Cécile Droz-Perroteau^{1,3,4},
Philip Robinson^{1,3}, Régis Lassalle^{1,3}, Abdelilah Abouelfath^{1,3}, Michel Boisseau¹, Christian Toussaint¹
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Metabolic Syndrome

Balneotherapy and Spa therapy; Preventive tools?

Hindawi Publishing Corporation
Evidence-Based Complementary and Alternative Medicine
Volume 2012, Article ID 150839, 7 pages
doi:10.1155/2012/150839

Overweight/Obesity

Research Article

One-Year Effectiveness of a 3-Week Balneotherapy Program for the Treatment of Overweight or Obesity

**Thierry Hanh,¹ Patrick Serog,² Jérôme Fauconnier,³ Pierre Batailler,³
Florence Mercier,⁴ Christian F. Roques,⁵ and Patrick Blin⁶**

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Balneotherapy and Spa therapy; Preventive tools?

The Journal of Nutrition, Health & Aging©
Volume 13, Number 9, 2009

JNHA: CLINICAL NEUROSCIENCES

BALNEOTHERAPY, PREVENTION OF COGNITIVE DECLINE AND CARE THE ALZHEIMER PATIENT AND HIS FAMILY: OUTCOME OF A MULTIDISCIPLINARY WORKGROUP

M. SECHER¹, M. SOTO², S. GILLETTE¹, S. ANDRIEU³, H. VILLARS¹, B. VELLAS¹
C. TABONE⁴, J.-B. CHAREYRAS⁵, O. DUBOIS⁶, C.-F. ROQUES⁷, B. DUBOIS⁸
AND THE MULTIDISCIPLINARY WORKGROUP

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Cognitive decline

Balneotherapy and Spa therapy; Preventive tools?

Int J Biometeorol (2015) 59:783–789

DOI 10.1007/s00484-014-0894-5

ORIGINAL PAPER

Obesity and Diabetes

Clinical and biochemical effects of a 3-week program of diet combined with spa therapy in obese and diabetic patients: a pilot open study

**Antonella Fioravanti • Przemysław Adamczyk •
Nicola Antonio Pascarelli • Chiara Giannitti •
Renato Urso • Michał Tołodziecki • Irena Ponikowska**

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Medicum in Bydgoszcz, UMK, Bydgoszcz, Poland

Balneologic treatments; other indications?

Heart Vessels (2013) 28:173–178
DOI 10.1007/s00380-011-0220-7

ORIGINAL ARTICLE

Hyperthermia by bathing in a hot spring improves cardiovascular functions and reduces the production of inflammatory cytokines in patients with chronic heart failure

Jun-ichi Oyama · Yoshihiro Kudo ·
Toyoki Maeda · Koichi Node · Naoki Makino

Department of Cardiovascular, Respiratory and Geriatric
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Eur Arch Otorhinolaryngol (2013) 270:565–570
DOI 10.1007/s00405-012-2024-5

RHINOLOGY

SPA therapy of upper respiratory tract inflammations

D. Passali · E. De Corso · S. Platzgummer ·
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Reumatismo, 2013; 65 (3): 121-125

ORIGINAL
ARTICLE

Bone mineral density in women on long-term mud-bath therapy in a *Salus per Aquam* (SPA) environment

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Balneologic treatments; other indications?

Int J Biometeorol

DOI 10.1007/s00484-015-0953-6

REVIEW PAPER

Health resort medicine in non-musculoskeletal disorders: is there evidence of its effectiveness?

**Marita Stier-Jarmer • Sandra Kus • Dieter Frisch •
Carla Sabariego • Angela Schuh**

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clinical improvement in other indications?

- Skin
- Respiratory
- Circulatory
- Digestive
- Nervous system
- Cancer

- nutritional and metabolic disorders
- mental disorders
- diseases of the ear
- endocrine diseases
- female genital diseases
- nutritional deficiencies

quality of evidence should be improved

Specific biochemical effects of chemical ingredients of balneological waters and peloids

- Sulfur
- Carbon dioxide
- Radon
- Humic substances

specific biochemical effects
of distinctive chemical
ingredients of balneological
waters and peloids

- clinical trials with biological markers' measurements
- studies of cell cultures
- experimental studies with animal models

Specific biochemical effects of chemical ingredients of balneological peloids

- Humic substances

PHYTOTHERAPY RESEARCH

Phytother. Res. **29**: 791–795 (2015)

Published online 3 March 2015 in Wiley Online Library
(wileyonlinelibrary.com) DOI: 10.1002/ptr.5319

REVIEW

The Antiinflammatory Properties of Humic Substances: A Mini Review

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Specific balneological agents; Sulfur

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Research Paper

Medicine

Sulphurous Mud-Balneotherapy: an Possible Strategy for the Plaque Psoriasis

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Radon

Rheumatol Int (2013) 33:2839–2850

DOI 10.1007/s00296-013-2819-8

ORIGINAL ARTICLE

Long-term benefits of radon spa therapy in rheumatic diseases: results of the randomised, multi-centre IMuRa trial

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Radon

Radiat Environ Biophys (2015) 54:123–136
DOI 10.1007/s00411-014-0568-z

ORIGINAL PAPER

Radon balneotherapy and physical activity for osteoporosis prevention: a randomized, placebo-controlled intervention study

**Martina Winklmayr · Christian Kluge ·
Wolfgang Winklmayr · Helmut Küchenhoff ·
Martina Steiner · Markus Ritter · Arnulf Hartl**

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Specific balneological agents; CO₂

Int J Biometeorol (2011) 55:657–663

DOI 10.1007/s00484-010-0380-7

REVIEW

Carbon dioxide balneotherapy and cardiovascular disease

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Specific balneological agents; CO₂

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Full paper

Percutaneous carbon dioxide mist treatment has protective effects in experimental myocardial infarction

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41. ISMH World Congress
19-21 May 2016 Bucharest
Romania ☺ ☺ ☺



Balneology/ISMH goes global

And !

43. ISMH World Congress
in Poland 2018



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