



World balneotherapy research update 2018

Global Thermal Think Tank

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There were 43 published articles
this year: 10 from Turkey and 4 from
Italy, our G3T 2018 host nation.

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The past year of relevant published scientific journal articles, by topic (to Sep 30, 2018)

Mental health and quality of life

ITALY Antonelli, M. and D. Donelli (2018).

"Effects of balneotherapy and spa therapy on levels of cortisol as a stress biomarker: a systematic review."

International Journal of Biometeorology 62(6): 913-924.

JAPAN Goto, Y., S. Hayasaka, S. Kurihara and Y. Nakamura (2018).

"Physical and Mental Effects of Bathing: A Randomised Intervention Study."

Evidence-based Complementary and Alternative Medicine 2018.

RUSSIA Krasnyanskaya, T. M. and V. G. Tylets (2017).

"The psychological security in the framework of the system of factors responsible for the effectiveness of spa and health resort-based rehabilitation."

Voprosy kurortologii, fizioterapii, i lechebnoi fizicheskoi kultury 94(4): 26-30.

GERMANY Naumann, J., J. Grebe, S. Kaifel, T. Weinert, C. Sadaghiani and R. Huber (2017).

"Effects of hyperthermic baths on depression, sleep and heart rate variability in patients with depressive disorder: A randomised clinical pilot trial."



BMC Complementary and Alternative Medicine 17(1).

GERMANY Stier-Jarmer, M., D. Frisch, C. Oberhauser, G. Immich, M. Kirschneck and A. Schuh (2017).

"Effects of single moor baths on physiological stress response and psychological state: a pilot study."

International Journal of Biometeorology 61(11): 1957-1964.

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Mental health and quality of life

RUSSIA Tsukurova, L. A. (2018).

"A neuroprotective approach to optimising treatment and correction activities in children with autism spectrum disorders."

Zh Nevrol Psichiatr Im S S Korsakova 118(5. Vyp. 2): 51-56.

CHINA Yang, B., Q. Z. Qin, L. L. Han, J. Lin and Y. Chen (2018).

"Spa therapy (balneotherapy) relieves mental stress, sleep disorder, and general health problems in sub-healthy people."

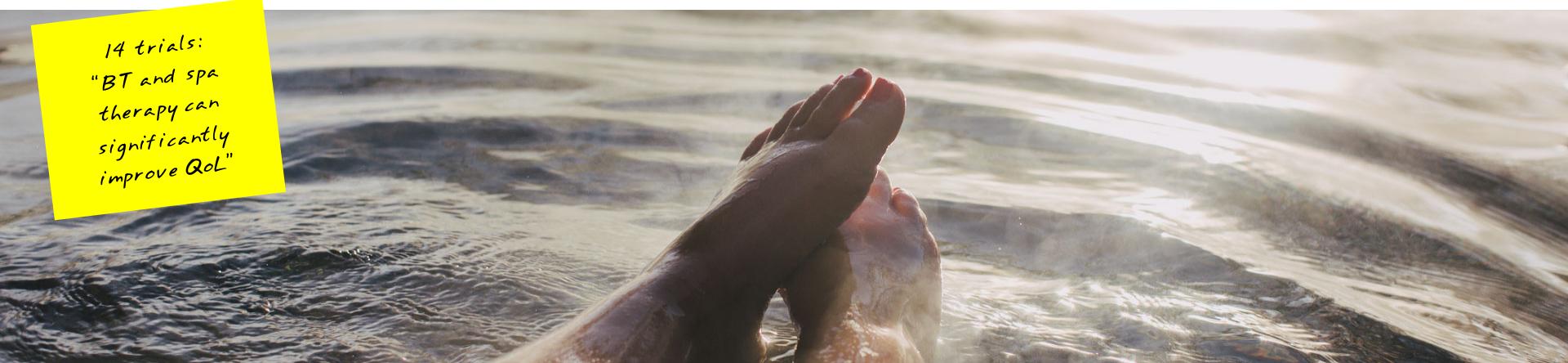
International Journal of Biometeorology 62(2): 261-272.

ITALY Antonelli, M., D. Donelli and A. Fioravanti (2018).

"Effects of balneotherapy and spa therapy on quality of life of patients with knee osteoarthritis: a systematic review and meta-analysis."

Rheumatology International 38(10): 1807-1824.

14 trials:
"BT and spa
therapy can
significantly
improve QoL"



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Mental health and quality of life

- JAPAN Fujimoto, S., Y. Iwawaki, Y. Takishita, Y. Yamamoto, M. Murota, S. Yoshioka, A. Hayano, T. Hosokawa and R. Yamanaka (2017).
"Effects and safety of mechanical bathing as a complementary therapy for terminal stage cancer patients from the physiological and psychological perspective: A pilot study."
Japanese Journal of Clinical Oncology 47(11): 1066-1072.

Marine Court
SB7000
apparatus.
5 min sessions
@ 41°C

V positive results.
Unfortunately, the pilot was
conducted in Palliative
Care Hospital of Kyoto
Prefectural University of
Medicine: apparently not
geothermal mineral water.
Worth mentioning because I
anticipate their next study
will involve onsen.

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Arthritis and other pain-causing conditions

ITALY Fioravanti, A., P. Manica, R. Bortolotti, G. Cevenini, S. Tenti and G. Paolazzi (2018).

"Is balneotherapy effective for fibromyalgia? Results from a 6-month double-blind randomised clinical trial."

Clinical Rheumatology 37(8): 2203-2212.

FRANCE Forestier, R. J., F. B. Erol Forestier and A. Francon (2017).

"Spa therapy (crenobalneotherapy) in low back pain: A critical review."

Revue du Rhumatisme Monographies 84(1): 91-98.

ITALY Fraioli, A., G. Mennuni, M. Fontana, S. Nocchi, F. Ceccarelli, C. Perricone and A. Serio (2018).

"Efficacy of spa therapy, mud-pack therapy, balneotherapy, and mud-bath therapy in the management of knee osteoarthritis."

A systematic review."

BioMed Research International 2018.

HUNGARY Gáti, T., I. K. Tefner, L. Kovács, K. Hodosi and T. Bender (2018).

"The effects of the calcium-magnesium-bicarbonate content in thermal mineral water on chronic low back pain: a randomised, controlled follow-up study."

International Journal of Biometeorology 62(5): 897-905.

15 min @ 36C, 6 X pw for 2 wks: Levico Terme Spa Center
100 patients, significant improvements in pain, general health and depression.
Pain was still better 6 MONTHS later.

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Arthritis and other pain-causing conditions

TURKEY Genç, A., S. U. Çelik, D. Evcik, E. D. Atman, A. H. Elhan and V. Genç (2018).

"Balneotherapy is an alternative treatment for mastalgia; a randomised controlled trial."

European Journal of Integrative Medicine 19: 100-104.

ITALY Giannitti, C., A. De Palma, N. A. Pascalelli, S. Cheleschi, N. Giordano, M. Galeazzi and A. Fioravanti (2017).

"Can balneotherapy modify microRNA expression levels in osteoarthritis?

A comparative study in patients with knee osteoarthritis."

International Journal of Biometeorology 61(12): 2153-2158.

HUNGARY Hanzel, A., K. Horvát, B. Molics, K. Berényi, B. Németh, K. Szendi and C. Varga (2018).

"Clinical improvement of patients with osteoarthritis using thermal mineral water at Szigetvár Spa

— results of a randomised double-blind controlled study."

International Journal of Biometeorology 62(2): 253-259.

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Arthritis and other pain-causing conditions

TURKEY Özkuk, K., B. Uysal, Z. Ateş, B. M. Ökmen, R. Sezer and G. Dilek (2018).

"The effects of inpatient versus outpatient spa therapy on pain, anxiety, and quality of life in elderly patients with generalised osteoarthritis: a pilot study."

International Journal of Biometeorology.

TURKEY Özkuk, K., H. Gürdal, M. Karagülle, Y. Barut, R. Eröksüz and M. Z. Karagülle (2017).

"Balneological outpatient treatment for patients with knee osteoarthritis; an effective non-drug therapy option in daily routine?"

International Journal of Biometeorology 61(4): 719-728.

TURKEY Ustyol, E. A., F. Karaarslan, S. Bekpinar, K. Ozkuk and N. Erdogan (2017).

"Effects of balneotherapy on serum levels of sphingosine-1-phosphate in patients with osteoarthritis."

Alternative Therapies in Health and Medicine 23(6): 10-14.

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Arthritis and other pain-causing conditions

TURKEY Karagülle, M., S. Kardeş and M. Z. Karagülle (2017).

"**Real-life effectiveness of spa therapy in rheumatic and musculoskeletal diseases: a retrospective study of 819 patients.**"

International Journal of Biometeorology 61(11): 1945-1956.

TURKEY Karagülle, M., S. Kardeş, O. Karagülle, R. Dişçi, A. Avci, İ. Durak and M. Z. Karagülle (2017).

"**Effect of spa therapy with saline balneotherapy on oxidant/antioxidant status in patients with rheumatoid arthritis: a single-blind randomised controlled trial.**"

International Journal of Biometeorology 61(1): 169-180.

TURKEY Karagülle, M., S. Kardeş, R. Dişçi and M. Z. Karagülle (2018).

"**Spa therapy adjunct to pharmacotherapy is beneficial in rheumatoid arthritis: a crossover randomised controlled trial.**"

International Journal of Biometeorology 62(2): 195-205.

- 536 osteoarthritis;
- 115 fibromyalgia;
- 50 lumbar disc herniation;
- 34 cervical disc herniation;
- 23 nonspecific low back pain;
- 22 ankylosing spondylitis;
- 16 rheumatoid arthritis;
- 9 rotator cuff tendinitis;
- 14 others
- Improved pain and function in all, except hip osteoarthritis and rheumatoid arthritis

ITALY Masiero, S., F. Vittadini, C. Ferroni, A. Bosco, R. Serra, A. C. Frigo and A. Frizziero (2018).

"**The role of thermal balneotherapy in the treatment of obese patients with knee osteoarthritis.**"

International Journal of Biometeorology 62(2): 243-252.

V positive
results, but only
10 participants

JAPAN Matsumoto, H., H. Hagino, K. Hayashi, Y. Ideno, T. Wada, T. Ogata, M. Akai, A. Seichi and T. Iwaya (2017).

"**The effect of balneotherapy on pain relief, stiffness, and physical function in patients with osteoarthritis of the knee: a meta-analysis.**"

Clinical Rheumatology 36(8): 1839-1847.

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Cardiovascular and blood flow

BRAZIL de Moraes Silva, M. A., L. C. U. Nakano, L. L. Cisneros and F. Miranda, Jr. (2018).

"Balneotherapy for chronic venous insufficiency."

Cochrane Database of Systematic Reviews 2018(7).

TURKEY Karaarslan, F., K. Ozkuk, S. Seringec Karabulut, S. Bekpinar, M. Z. Karagulle and N. Erdogan (2018).

"How does spa treatment affect cardiovascular function and vascular endothelium in patients with generalised osteoarthritis? A pilot study through plasma asymmetric di-methyl arginine (ADMA) and L-arginine/ADMA ratio."

International Journal of Biometeorology 62(5): 833-842.

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Dermatology

SPAIN Carbajo, J. M. and F. Maraver (2018).

"Salt water and skin interactions: new lines of evidence."

International Journal of Biometeorology 62(8): 1345-1360.

SPAIN Carbajo, J. M., J. Ubogui, L. Vela and F. Maraver (2018).

"Sulphurous minerals waters and psoriasis."

Medicina Naturista 12(1): 60-62.

USA Gittler, J. K., J. F. Wang and S. J. Orlow (2017).

"Bathing and Associated Treatments in Atopic Dermatitis."

American Journal of Clinical Dermatology 18(1): 45-57.

USA Huang, A., S. Seit  and T. Adar (2018).

"The use of balneotherapy in dermatology."

Clinics in Dermatology 36(3): 363-368.

X3 very different waters:
• Dead Sea
• La Roche-Posay Thermal Center France
• Blue Lagoon, Iceland

STH KOREA Park, M., E. M. Jin, B. C. Park, M. H. Kim and S. P. Hong (2017).

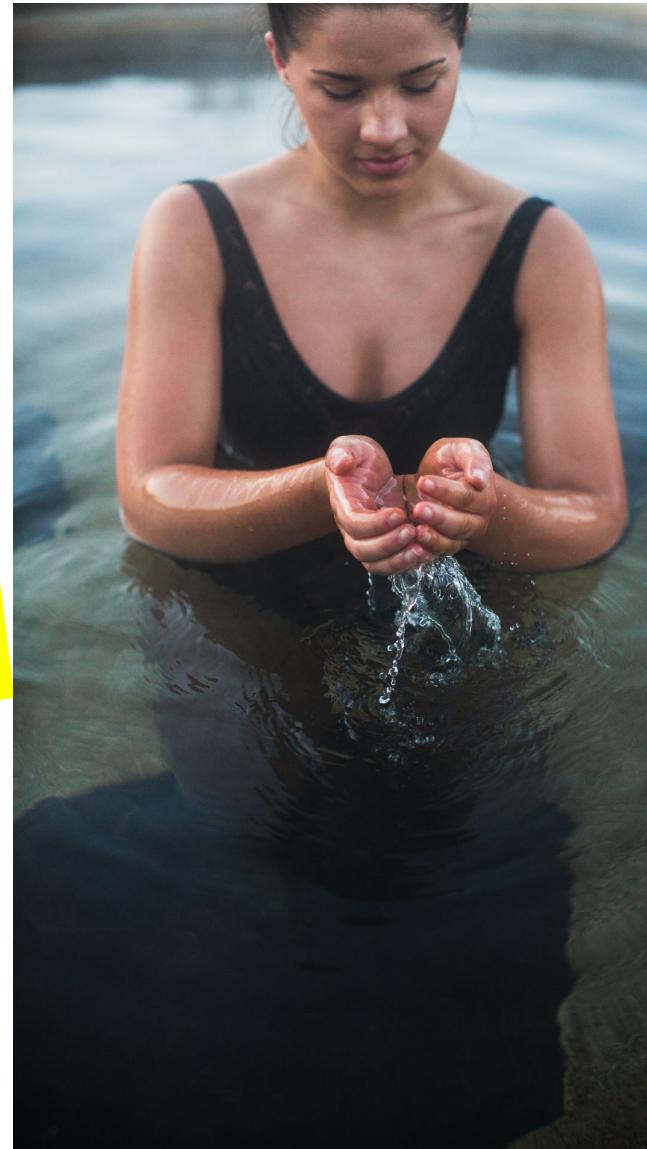
"A survey on the awareness of balneotherapy in dermatologic outpatients and dermatologists."

Korean Journal of Dermatology 55(2): 104-109.

HUNGARY P ter, I., A. Jagicza, Z. Ajtay, I. Boncz, I. Kiss, K. Szendi, P. Kust n and B. N meth (2017).

"Balneotherapy in psoriasis rehabilitation."

In Vivo 31(6): 1163-1168.



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Immunology

SPAIN Gálvez, I., S. Torres-Piles and E. Ortega-Rincón (2018).

"Balneotherapy, immune system, and stress response: A hormetic strategy?"

International Journal of Molecular Sciences 19(6).

GERMANY Schäfer, C. (2017).

"Healthy bathing: Preventing diseases with medical bath additives and mud baths."

Deutsche Apotheker Zeitung 157(40).

HUNGARY Tamás, B. (2017).

"Based on recent evidence, for what kind of diseases are the Hungarian thermal waters beneficial?"

Lege Artis Medicinae 27(3): 86-92.

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Mechanisms of action

GERMANY Gröber, U., T. Werner, J. Vormann and K. Kisters (2017).
"Myth or reality -transdermal magnesium?"
Nutrients 9(8).

Ops, review states:
"scientifically
unsupported"

SPAIN Morer, C., C. F. Roques, A. Françon, R. Forestier and F. Maraver (2017).
"The role of mineral elements and other chemical compounds used in balneology: data from double-blind randomised clinical trials."
International Journal of Biometeorology 61(12): 2159-2173.

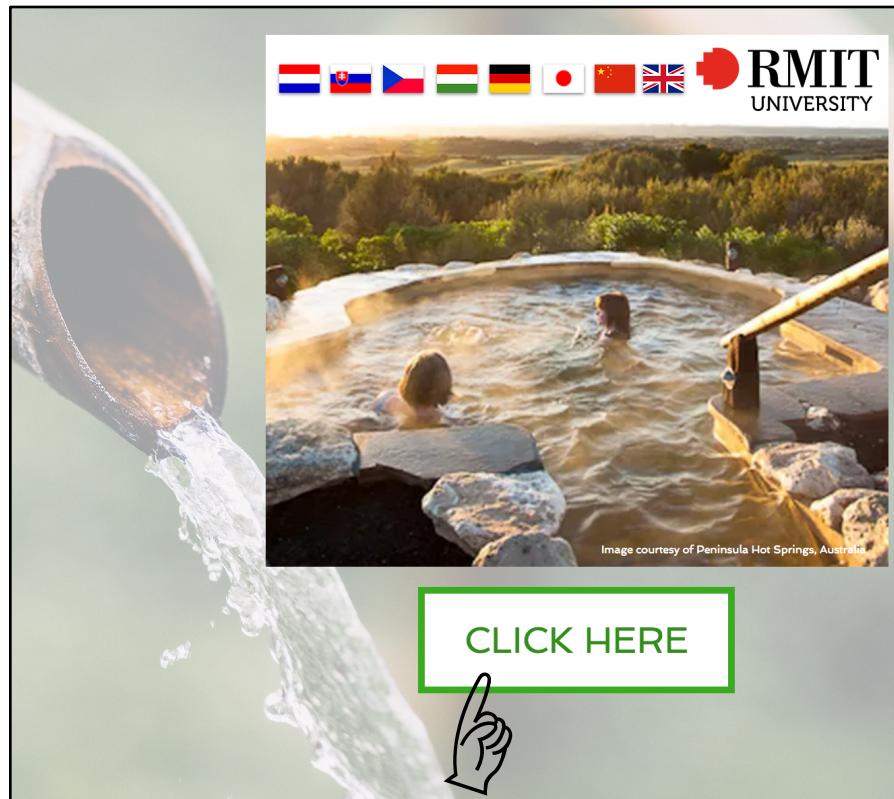
CHINA Xu, L., L. Wu, T. Liu, W. Xing, X. Cao, S. Zhang and Z. Su (2017).
"Effect of a 21-day balneotherapy program on blood cell counts, ponogen levels, and blood biochemical indexes in servicemen in sub-health condition."
Journal of Physical Therapy Science 29(9): 1573-1577.

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Miscellaneous

- JAPAN** Munetsugu, T., T. Fujimoto, Y. Oshima, K. Sano, H. Murota, T. Satoh, S. Iwase, M. Asahina, Y. Nakazato and H. Yokozeki (2017).
"Revised guideline for the diagnosis and treatment of acquired idiopathic generalised anhidrosis in Japan."
Journal of Dermatology 44(4): 394-400.
- TURKEY** Dandinoglu, T., O. Dandin, T. Ergin, D. Tihan, Y. K. Akpak, O. U. Aydin and U. Teomete (2017).
"Can balneotherapy improve the bowel motility in chronically constipated middle-aged and elderly patients?"
International Journal of Biometeorology 61(6): 1139-1148.
- SPAIN** Bacaicoa, J. S. M. (2017).
"Therapeutic action of the waters of San Nicolás Spa, Alhama de Almería."
Anales de la Real Academia Nacional de Farmacia 83(5): 157-185.
- POLAND** Dobrzyński, D., A. Boguszewska-Czubara and K. Sugimori (2018).
"Hydrogeochemical and biomedical insights into germanium potential of curative waters: a case study of health resorts in the Sudetes Mountains (Poland)."
Environmental Geochemistry and Health: 1-21.
- TURKEY** Baysal, E., H. Leblebicioglu, L. Khorshid and D. Sari (2018)
"Why individuals choose balneotherapy and benefit from this kind of treatment."
Complement Ther Clin Pract 32: 157-162.

hotspringsurvey.org



Responses n=3622

This online survey aims to explore the characteristics, motivations and experiences of natural thermal mineral spring bathers worldwide and any perceived effects that hot spring bathing has on their health and wellbeing.

- A Qualtrics online survey
- Ethics approved 08/06/17.
- Translated to/from and active in 8 languages: Chinese, Czech, English, German, Hungarian, Japanese, Russian, Slovak .
- First response 28/08/17
- Survey currently closed.
- Results not yet submitted for publishing

	Mild: easily relieved by simple treatment	Moderate: treated with basic first aid and/or non prescription drugs	Severe: health practitioner treatment and/or prescription medicine required	Very severe: hospitalisation required in the past 6 months	Total
back pain	208	157	134	15	514
arthritis	187	100	104	2	393
tiredness/fatigue	158	139	82	2	381
stress	171	119	83	4	377
anxiety	125	98	114	8	345
overweight	154	113	42	2	311
injury	98	95	83	15	291
depression	72	58	128	11	269
chronic pain	59	80	114	11	264
asthma	82	49	87	1	219
allergies	99	74	31	2	206
skin conditions	105	54	45	0	204
insomnia	76	75	53	0	204
high blood pressure	45	20	111	1	177
digestive problem	50	33	46	6	135
post-traumatic stress	43	27	48	6	124
thyroid problem	35	13	60	3	111
auto-immune disease	22	23	53	8	106
heart disease	39	6	25	4	74
Other	14	14	37	8	73
diabetes	31	4	32	1	68
cancer	15	3	21	9	48
underweight	14	5	2	2	23
drug or alcohol problems	12	3	4	1	20
Total	1914	1362	1539	122	4937

Those who answered
 “do you have a
 medical condition”:

NO: n= 2389
 YES n = **1036**

Multiple answers were
 allowed, enabling study
 of relief from generally
 accepted mental health
 co-morbidities

The preliminary survey data presented within detailed charts and tables at the October 2018 Global Thermal Think Tank event is unavailable for print/web/email distribution until published in a peer-reviewed science journal.



A brief overview: The data includes cross-tabulations of various musculoskeletal conditions with mental health answers. We can therefore see, for example, the number of those who reported arthritis and also reported having anxiety, along with their stated relief from the anxiety after bathing.

Cross-tab treatment of reported sleep quality with reported medical conditions also gives much sleep data.

I look forward to sharing the full data when published.

Regards, James Clark-Kennedy.



'A city without a hammam is not a city...'
- Sheherezade, *Tales from the Arabian Nights*