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

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

Mental health and quality of life

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

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

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

GERMANY
"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
"Effects of single moor baths on physiological stress response and psychological state: a pilot study."
Mental health and quality of life

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

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."

"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.
Mental health and quality of life


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.
Arthritis and other pain-causing conditions

ITALY
"Is balneotherapy effective for fibromyalgia? Results from a 6-month double-blind randomised clinical trial."
Clinical Rheumatology 37(8): 2203-2212.

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

FRANCE
"Spa therapy (crenobalneotherapy) in low back pain: A critical review."
Revue du Rhumatisme Monographies 84(1): 91-98.

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

TURKEY
"Balneotherapy is an alternative treatment for mastalgia; a randomised controlled trial."
European Journal of Integrative Medicine 19: 100-104.

ITALY

HUNGARY
"Clinical improvement of patients with osteoarthritis using thermal mineral water at Szigetvár Spa — results of a randomised double-blind controlled study."
**Arthritis and other pain-causing conditions**

"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?"

"Effects of balneotherapy on serum levels of shingosine-1-phosphate in patients with osteoarthritis."
Arthritis and other pain-causing conditions

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

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

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

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

"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.
Cardiovascular and blood flow

"Balneotherapy for chronic venous insufficiency."
Cochrane Database of Systematic Reviews 2018(7).

"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."
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Dermatology

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

"Sulphurous minerals waters and psoriasis."

"Bathing and Associated Treatments in Atopic Dermatitis."

"The use of balneotherapy in dermatology."
Clinics in Dermatology 36(3): 363-368.

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

"Balneotherapy in psoriasis rehabilitation."
In Vivo 31(6): 1163-1168.
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).

"Healthy bathing: Preventing diseases with medical bath additives and mud baths."
Deutsche Apotheker Zeitung 157(40).

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

**GERMANY**
"Myth or reality - transdermal magnesium?"
Nutrients 9(8).

**SPAIN**
"The role of mineral elements and other chemical compounds used in balneology: data from double-blind randomised clinical trials."

**CHINA**
"Effect of a 21-day balneotherapy program on blood cell counts, ponogen levels, and blood biochemical indexes in servicemen in sub-health condition."
World balneotherapy research update 2018

Miscellaneous

"Revised guideline for the diagnosis and treatment of acquired idiopathic generalized anhidrosis in Japan."

"Can balneotherapy improve the bowel motility in chronically constipated middle-aged and elderly patients?"

"Therapeutic action of the waters of San Nicolás Spa, Alhama de Almería."
Anales de la Real Academia Nacional de Farmacia 83(5): 157-185.

"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.

"Why individuals choose balneotherapy and benefit from this kind of treatment."
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

Responses n=3622
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

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Very severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>back pain</td>
<td>208</td>
<td>157</td>
<td>134</td>
<td>15</td>
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<tr>
<td>arthritis</td>
<td>187</td>
<td>100</td>
<td>104</td>
<td>2</td>
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<tr>
<td>tiredness/fatigue</td>
<td>158</td>
<td>139</td>
<td>82</td>
<td>2</td>
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<tr>
<td>stress</td>
<td>171</td>
<td>119</td>
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<tr>
<td>anxiety</td>
<td>125</td>
<td>98</td>
<td>114</td>
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<tr>
<td>overweight</td>
<td>154</td>
<td>113</td>
<td>42</td>
<td>2</td>
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<tr>
<td>injury</td>
<td>98</td>
<td>95</td>
<td>83</td>
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<tr>
<td>depression</td>
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<td>58</td>
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<td>cancer</td>
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<td>5</td>
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<tr>
<td>drug or alcohol problems</td>
<td>12</td>
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<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>
| 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

With thanks to Peninsula Hot Springs for images