

## Appendix A. Supplementary data

No.	Source	Title	PEDro Score
1	PEDro	Karagülle M, Karagülle MZ. Effectiveness of balneotherapy and spa therapy for the treatment of chronic low back pain: a review on latest evidence. <i>Clin Rheumatol.</i> 2015;34(2):207–14.	10
2	NCBI/PMC	Dolbeth M, Stålnacke P, Alves FL, Sousa LP, Gooch GD, Khokhlov V, et al. An integrated Pan-European perspective on coastal Lagoons management through a mosaic-DPSIR approach. <i>Sci Rep.</i> 2016;6(March 2015):1–12.	10
3	NCBI/PMC	Zampieri RM, Adessi A, Caldara F, Codato A, Furlan M, Rampazzo C, et al. Anti-inflammatory activity of exopolysaccharides from <i>Phormidium</i> sp. ETS05, the most abundant cyanobacterium of the therapeutic euganean thermal muds, using the zebrafish model. <i>Biomolecules.</i> 2020;10(4).	10
4	NCBI/PMC	Masiero S, Maccarone MC, Magro G. Balneotherapy and human immune function in the era of COVID-19. <i>Int J Biometeorol.</i> 2020;64(8):1433–4.	10
5	NCBI/PMC	Fraioli A, Mennuni G, Fontana M, Nocchi S, Ceccarelli F, Perricone C, et al. Efficacy of spa therapy, mud-pack therapy, balneotherapy, and mud-bath therapy in the management of knee osteoarthritis. A systematic review. <i>Biomed Res Int.</i> 2018;2018.	10
6	NCBI/PMC	Valeriani F, Margarucci LM, Spica VR. Recreational use of spa thermal waters: Criticisms and perspectives for innovative treatments. <i>Int J Environ Res Public Health.</i> 2018;15(12).	10
7	NCBI/PMC	Kim MH, Choi G, Elzatahry A, Vinu A, Choy Y Bin, Choy JH. Review of clay-drug hybrid materials for biomedical applications: Administration routes. <i>Clays Clay Miner.</i> 2016;64(2):115–30.	10
8	NCBI/PMC	Carbajo JM, Maraver F. Sulphurous mineral waters: New applications for health. <i>Evidence-based Complement Altern Med.</i> 2017;2017.	10
9	NCBI/PMC	Murakami S, Goto Y, Ito K, Hayasaka S, Kurihara S, Soga T, et al. The Consumption of Bicarbonate-Rich Mineral Water Improves Glycemic Control. <i>Evidence-based Complement Altern Med.</i> 2015;2015.	10
10	NCBI/PMC	Bullitta S, Re GA, Manunta MDI, Piluzza G. Traditional knowledge about plant, animal, and mineral-based remedies to treat cattle, pigs, horses, and other domestic animals in the Mediterranean island of Sardinia. <i>J Ethnobiol Ethnomed.</i> 2018;14(1):1–26.	10
11	NCBI/PubMed	Verhagen Arianne P, Bierma-Zeinstra Sita MA, Boers Maarten, Cardoso Jefferson R, Lambeck Johan, de Bie Rob de VHC. Balneotherapy (or spa therapy) for rheumatoid arthritis (Review). 2015;	10
12	NCBI/PubMed	Fioravanti A, Giannitti C, Cheleschi S, Simpatico A, Pascarelli NA, Galeazzi M. Circulating levels of adiponectin, resistin, and visfatin after mud-bath therapy in patients with bilateral knee osteoarthritis. <i>Int J Biometeorol.</i> 2015;59(11):1691–700.	10
13	NCBI/PubMed	Maeda T, Kudo Y, Horiuchi T, Makino N. Clinical and anti-aging effect of mud-bathing therapy for patients with fibromyalgia. <i>Mol Cell Biochem [Internet].</i> 2018;444(1–2):87–92. Available from: <a href="http://dx.doi.org/10.1007/s11010-017-3233-4">http://dx.doi.org/10.1007/s11010-017-3233-4</a>	10
14	NCBI/PubMed	Gálvez I, Torres-Piles S, Ortega E. Effect of mud-bath therapy on the innate/inflammatory responses in elderly patients with osteoarthritis: a discussion of recent results and a pilot study on the role of the innate function of monocytes. <i>Int J Biometeorol.</i> 2020;64(6):927–35.	10
15	NCBI/PubMed	Yücesoy H, Geçmen İ, Adıgüzel T, Karagülle M, Karagülle MZ. Efficacy of balneological outpatient treatment (hydrotherapy and peloidotherapy) for the management of chronic low back pain: a retrospective study. <i>Int J Biometeorol.</i> 2019;63(3):351–7.	10
16	NCBI/PubMed	Gomes C de SF. Healing and edible clays: a review of basic concepts, benefits and risks. <i>Environ Geochem Health.</i> 2018;40(5):1739–65.	10
17	NCBI/PubMed	Awad ME, López-Galindo A, Setti M, El-Rahmany MM, Iborra CV. Kaolinite in pharmaceuticals and biomedicine. Vol. 533, <i>International Journal of Pharmaceutics.</i> Elsevier B.V.; 2017. p. 34–48.	10
18	NCBI/PubMed	Forestier R, Suehs C, Françon A, Marty M, Genevay S, Sellam J, et al. Usual care including home exercise with versus without spa therapy for chronic low back pain: Protocol for the LOMBATHERM' study, a multicentric randomised controlled trial. <i>Trials.</i> 2020;21(1):1–12.	10
19	NCBI/PubMed	Fioravanti A, Bacaro G, Giannitti C, Tenti S, Cheleschi S, Guìdelli GM, et al. One-year follow-up of mud-bath therapy in patients with bilateral knee osteoarthritis: a randomized, single-blind controlled trial. <i>Int J Biometeorol.</i> 2015;59(9):1333–43.	10
20	NCBI/PubMed	Forestier R, Erol Forestier FB, Francon A. Spa therapy and knee osteoarthritis: A systematic review. <i>Ann Phys Rehabil Med.</i> 2016;59(3):216–26.	10
21	NCBI/PubMed	Varzaityte L, Kubilius R, Rapoliene L, Bartuseviciute R, Balcius A, Ramanauskas K, et al. The effect of balneotherapy and peloid therapy on changes in the functional state of patients with knee joint osteoarthritis: a randomized, controlled, single-blind pilot study. <i>Int J Biometeorol.</i> 2020;64(6):955–64.	10

22	NCBI/PubMed	Cheleschi S, Gallo I, Tenti S. A comprehensive analysis to understand the mechanism of action of balneotherapy: why, how, and where they can be used? Evidence from in vitro studies performed on human and animal samples. <i>Int J Biometeorol.</i> 2020;64(7):1247–61.	10
23	NCBI/PubMed	Morer C, Roques CF, Françon A, Forestier R, Maraver F. The role of mineral elements and other chemical compounds used in balneology: data from double-blind randomized clinical trials. <i>Int J Biometeorol.</i> 2017;61(12):2159–73.	10
24	NCBI/PubMed	Morrison KD, Misra R, Williams LB. Unearthing the Antibacterial Mechanism of Medicinal Clay: A Geochemical Approach to Combating Antibiotic Resistance. <i>Sci Rep.</i> 2016;6(August 2015):1–13.	10
25	Web of Science	Özkuk K, Gürdal H, Karagülle M, Barut Y, Eröksüz R, Karagülle MZ. Balneological outpatient treatment for patients with knee osteoarthritis: an effective non-drug therapy option in daily routine? <i>Int J Biometeorol.</i> 2017;61(4):719–28.	10
26	Web of Science	Gálvez I, Torres-Piles S, Ortega-Rincón E. Balneotherapy, immune system, and stress response: A hormetic strategy? <i>Int J Mol Sci.</i> 2018;19(6).	10
27	Web of Science	Carretero MI. Clays in pelotherapy. A review. Part I: Mineralogy, chemistry, physical and physicochemical properties. Vol. 189, <i>Applied Clay Science.</i> Elsevier Ltd; 2020. p. 105526.	10
28	NCBI/PubMed	Pascarelli NA, Cheleschi S, Bacaro G, Guidelli GM, Galeazzi M, Fioravanti A. Effect of mud-bath therapy on serum biomarkers in patients with knee osteoarthritis: Results from a randomized controlled trial. <i>Isr Med Assoc J.</i> 2016;18(3–4):232–7.	9
29	NCBI/PubMed	Bernetti A, Mangone M, Alviti F, Paolucci T, Attanasi C, Murgia M, et al. Spa therapy and rehabilitation of musculoskeletal pathologies: a proposal for best practice in Italy. <i>Int J Biometeorol.</i> 2020;64(6):905–14.	9
30	Web of Science	Viseras C, Carazo E, Borrego-Sánchez A, García-Villén F, Sánchez-Espejo R, Cerezo P, et al. Clay minerals in skin drug delivery. <i>Clays Clay Miner.</i> 2019;67(1):59–71.	9
31	NCBI/PubMed	Ortega E, Gálvez I, Hinchado MD, Guerrero J, Martín-Cordero L, Torres-Piles S. Anti-inflammatory effect as a mechanism of effectiveness underlying the clinical benefits of pelotherapy in osteoarthritis patients: regulation of the altered inflammatory and stress feedback response. <i>Int J Biometeorol.</i> 2017;61(10):1777–85.	8
32	NCBI/PMC	Kamioka H, Nobuoka S, Iiyama J. Overview of systematic reviews with meta-analysis based on randomized controlled trials of balneotherapy and spa therapy from 2000 to 2019. <i>Int J Gen Med.</i> 2020;13:429–42.	7
33	NCBI/PMC	Lee CW, Li C. The process of constructing a health tourism destination index. <i>Int J Environ Res Public Health.</i> 2019;16(22).	7
34	NCBI/PubMed	Spilioti E, Vargiami M, Letsiou S, Gardikis K, Sygouni V, Koutsoukos P, et al. Biological properties of mud extracts derived from various spa resorts. <i>Environ Geochem Health.</i> 2017;39(4):821–33.	7
35	NCBI/PubMed	Eröksüz R, Erol Forestier FB, Karaaslan F, Forestier R, İşsever H, Erdoğan N, et al. Comparison of intermittent and consecutive balneological outpatient treatment (hydrotherapy and peloidotherapy) in fibromyalgia syndrome: a randomized, single-blind, pilot study. <i>Int J Biometeorol.</i> 2020;64(3):513–20.	7
36	NCBI/PMC	Gowda S, Mohanty S, Saoji A, Nagarathna R. Integrated Yoga and Naturopathy module in management of Metabolic Syndrome: A case report. <i>J Ayurveda Integr Med [Internet].</i> 2017;8(1):45–8. Available from: <a href="http://dx.doi.org/10.1016/j.jaim.2016.10.006">http://dx.doi.org/10.1016/j.jaim.2016.10.006</a>	6
37	NCBI/PubMed	Ionescu E V., Tica I, Oprea C, Iliescu DM, Petcu LC, Iliescu MG. Adiponectin correlation with bioclinical benefits of using natural therapeutic factors in knee osteoarthritis. <i>Acta Endocrinol (Copenh).</i> 2017;13(3):308–13.	6
38	NCBI/PubMed	Xiang J, Wu D, Li J. Clinical Efficacy of Mudpack Therapy in Treating Knee Osteoarthritis: A Meta-Analysis of Randomized Controlled Studies. <i>Am J Phys Med Rehabil.</i> 2016;95(2):121–31.	6
39	NCBI/PubMed	Gungen GO, Ardic F, Findikoglu G, Rota S. Effect of mud compress therapy on cartilage destruction detected by CTX-II in patients with knee osteoarthritis. <i>J Back Musculoskelet Rehabil.</i> 2016;29(3):429–38.	6
40	NCBI/PubMed	Masiero S, Litwocenko S, Agostini F. Rehabilitation in an Italian thermal setting: a new therapeutic strategy for patients with musculoskeletal disability—the results of an Italian survey. <i>Int J Biometeorol.</i> 2020;64(6):951–4.	6
41	NCBI/PubMed	Tran Thi Man, Tran Thi Lan, Nguyen Anh Duong PLA. Assessment of the usability of Tam Bo bentonite (Di Linh - Lam Dong) for peloid. <i>Vietnam J Earth Sci.</i> 2020;42(4):384–94.	6
42	NCBI/PMC	Chary-Valckenaere I, Loeuille D, Jay N, Kohler F, Tamisier JN, Roques CF, et al. Spa therapy together with supervised self-mobilisation improves pain, function and quality of life in patients with chronic shoulder pain: a single-blind randomised controlled trial. <i>Int J Biometeorol.</i> 2018;62(6):1003–14.	5
43	NCBI/PubMed	López PC. Balneotherapy treatment for patients suffering from low back pain. <i>Balneo Res J.</i>	5

		2019;10(10.2):167–73.	
44	NCBI/PubMed	Hou C, Liang L, Chu X, Qin W, Li Y, Zhao Y. The short-term efficacy of mud therapy for knee osteoarthritis: A meta-analysis. <i>Medicine (Baltimore)</i> . 2020;99(17):e19761.	5
45	NCBI/PubMed	Gálvez I, Torres-Piles S, Ortega E. Innate/inflammatory bioregulation and clinical effectiveness of whole-body hyperthermia (balneotherapy) in elderly patients with osteoarthritis. <i>Int J Hypertherm [Internet]</i> . 2018;35(1):340–7. Available from: <a href="https://doi.org/10.1080/02656736.2018.1502896">https://doi.org/10.1080/02656736.2018.1502896</a>	5
46	NCBI/PubMed	Ma'or Z, Halicz L, Portugal-Cohen M, Russo MZ, Robino F, Vanhaecke T, et al. Safety evaluation of traces of nickel and chrome in cosmetics: The case of Dead Sea mud. <i>Regul Toxicol Pharmacol [Internet]</i> . 2015;73(3):797–801. Available from: <a href="http://dx.doi.org/10.1016/j.yrtph.2015.10.016">http://dx.doi.org/10.1016/j.yrtph.2015.10.016</a>	5
47	NCBI/PubMed	Carbajo JM, Maraver F. Salt water and skin interactions: new lines of evidence. <i>Int J Biometeorol</i> . 2018;62(8):1345–60.	5
48	NCBI/PubMed	Tenti S, Manica P, Chelleschi S, Fioravanti A. Sulfurous-arsenical-ferruginous balneotherapy for osteoarthritis of the hand: results from a retrospective observational study. <i>Int J Biometeorol</i> . 2020;1561–9.	5
49	Web of Science	Cantista P, Maraver F. Balneotherapy for knee osteoarthritis in S. Jorge: a randomized controlled trial. <i>Int J Biometeorol</i> . 2020;64(6):1027–38.	5
50	Web of Science	Barhoumi T, Bekri-Abbes I, Srasra E. Physicochemical characteristics and suitability of curative pastes made of Tunisian clay minerals and thermal waters for use in pelotherapy. <i>Comptes Rendus Chim [Internet]</i> . 2019;22(2–3):126–31. Available from: <a href="https://doi.org/10.1016/j.crci.2018.11.006">https://doi.org/10.1016/j.crci.2018.11.006</a>	5
51	Web of Science	Glavaš N, Mourelle ML, Gómez CP, Legido JL, Rogan Šmuc N, Dolenc M, et al. The mineralogical, geochemical, and thermophysical characterization of healing saline mud for use in pelotherapy. <i>Appl Clay Sci</i> . 2017;135:119–28.	5
52	PE德罗	Alfieri FM, Barros MCC, Carvalho KC de, Toral I, Silva CF da, Vargas e Silva NC de O. Geotherapy combined with kinesiotherapy is efficient in reducing pain in patients with osteoarthritis. <i>J Bodyw Mov Ther</i> . 2020;24(1):77–81.	4
53	NCBI/PMC	Kim M, Lee KH, Han SH, Lee SJ, Kim CG, Choi JH, et al. Effect of Peat Intervention on Pain and Gait in Patients with Knee Osteoarthritis: A Prospective, Double-Blind, Randomized, Controlled Study. <i>Evidence-based Complement Altern Med</i> . 2020;2020.	4
54	NCBI/PMC	Tékus V, Borbély, Kiss T, Perkecz A, Kemény, Horváth J, et al. Investigation of Lake Hévíz Mineral Water Balneotherapy and Hévíz Mud Treatment in Murine Osteoarthritis and Rheumatoid Arthritis Models. <i>Evidence-based Complement Altern Med</i> . 2018;2018.	4
55	NCBI/PMC	Naumann J, Sadaghiani C, Bureau N, Schmidt S, Huber R. Outcomes from a three-arm randomized controlled trial of frequent immersion in thermoneutral water on cardiovascular risk factors. <i>BMC Complement Altern Med [Internet]</i> . 2016;16(1):1–8. Available from: <a href="http://dx.doi.org/10.1186/s12906-016-1241-7">http://dx.doi.org/10.1186/s12906-016-1241-7</a>	4
56	NCBI/PMC	Couteau Céline, Coiffar L. Phycocosmetics and Other Marine Cosmetics, Specific Cosmetics Formulated Using Marine Resources Céline. 2020;	4
57	NCBI/PubMed	Gomes CF, Gomes JH, da Silva EF. Bacteriostatic and bactericidal clays: an overview. <i>Environ Geochem Health [Internet]</i> . 2020;42(11):3507–27. Available from: <a href="https://doi.org/10.1007/s10653-020-00628-w">https://doi.org/10.1007/s10653-020-00628-w</a>	4
58	NCBI/PubMed	Drobnik J, Stebel A. Central European ethnomedical and officinal uses of peat, with special emphasis on the Tolpa peat preparation (TPP): An historical review. 2019; Available from: <a href="https://doi.org/10.1016/j.jep.2019.112248">https://doi.org/10.1016/j.jep.2019.112248</a>	4
59	NCBI/PubMed	Stier-Jarmer M, Frisch D, Oberhauser C, Immich G, Kirschneck M, Schuh A. Effects of single moor baths on physiological stress response and psychological state: a pilot study. <i>Int J Biometeorol</i> . 2017;61(11):1957–64.	4
60	NCBI/PubMed	Martínez-Villegas N, Suárez Muñoz M, González-Hernández P, Melián Rodríguez C, Barrios Cossio J, Hernández Díaz R, et al. Inorganic and organic characterization of Santa Lucía salt mine peloid for quality evaluations. <i>Environ Sci Pollut Res</i> . 2020;27(14):15944–58.	4
61	NCBI/PubMed	Hahm SC, Shin HJ, Lee MG, Lee SJ, Cho HY. Mud Therapy Combined with Core Exercise for Chronic Nonspecific Low Back Pain: A Pilot, Single-Blind, Randomized Controlled Trial. <i>Evidence-based Complement Altern Med</i> . 2020;2020.	4
62	NCBI/PubMed	Cozzi F, Galozzi P, Ciprian L, Zanatta E, Polito P, Oliviero F, et al. Mud-bath treatment of seronegative spondyloarthritis: experience at the Euganean Thermal Area. <i>Int J Biometeorol</i> . 2020;64(6):937–41.	4
63	NCBI/PubMed	Kasapoğlu Aksoy M, Altan L, Eröksüz R, Metin Ökmen B. The efficacy of peloid therapy in management of hand osteoarthritis: a pilot study. Vol. 61, <i>International Journal of Biometeorology</i> . 2017. p. 2145–52.	4
64	Web of Science	García-Villén F, Sánchez-Espejo R, Carazo E, Borrego-Sánchez A, Aguzzi C, Cerezo P, et al. Characterisation of Andalusian peats for skin health care formulations. 2017; Available from:	4

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<b>65</b>	<b>Web of Science</b>	Sergio Cardoso da Silva P, Koyaishi Torrecilha J, Flávio de Macedo Gouvea P, Francis Máduar M, Maria Barros de Oliveira S, Antonio Scapin M. Chemical and radiological characterization of Peruíbe Black Mud. 2015; Available from: <a href="http://dx.doi.org/10.1016/j.clay.2015.09.016">http://dx.doi.org/10.1016/j.clay.2015.09.016</a>	<b>4</b>
<b>66</b>	<b>Web of Science</b>	Sánchez-Espejo R, Cerezo P, Aguzzi C, López-Galindo A, Machado J, Viseras C. Physicochemical and in vitro cation release relevance of therapeutic muds “maturation.” 2015; Available from: <a href="http://dx.doi.org/10.1016/j.clay.2015.08.007">http://dx.doi.org/10.1016/j.clay.2015.08.007</a>	<b>4</b>
<b>67</b>	<b>Web of Science</b>	Iliescu MG, Profir D, Surdu O, Marin V, Demirgean S, Almasan RE, et al. Statistical view through balneal activity in Techirghiol medical area. <i>J Environ Prot Ecol.</i> 2018;19(1):382–91.	<b>4</b>
<b>68</b>	<b>Web of Science</b>	Armijo F, Maraver F, Pozo M, Isabel Carretero M, Armijo O, Ángel Fernández-Torán M, et al. Thermal behaviour of clays and clay-water mixtures for pelotherapy. 2016; Available from: <a href="http://dx.doi.org/10.1016/j.clay.2016.02.020">http://dx.doi.org/10.1016/j.clay.2016.02.020</a>	<b>4</b>