

The efficiency of (Holy) Makka mud therapy (MMT) in treating various health problems: A pilot studyManal G. Abd El Wahab¹ and Salwa Sager²¹Department of Anatomy, Faculty of Medicine for Girls, Al Azhar University, Cairo, Egypt. and (YAJ) Members of Yousef Abdul Latif Jameel Scientific Chair of Prophetic Medicine Applications, Faculty of Medicine, King Abdulaziz University (KAU) Jeddah Kingdom of Saudi Arabia (KSA).²Certified nurse, Ministry of health Taif Hospital, KSA. and (YAJ) Members of Yousef Abdul Latif Jameel Scientific Chair of Prophetic Medicine Applications, Faculty of Medicine, King Abdulaziz University (KAU) Jeddah Kingdom of Saudi Arabia (KSA)omaman2005@hotmail.com

Abstract: Ancient people treated health problems and pain using mud. **Objectives:** A pilot study on Makka mud therapy (MMT) on some diseases, to put forward evidence –based treatment protocol and guidelines using (MMT). **Patients and methods:** Patients with different ages, sex, and diseases were subjected to (MMT) alone or combined with / hijama. or honey, or medical plants. Mud was prepared from Makka soil present in the sail road from kaekea area, Jazan. KSA, mixed with tap water or Zamzam water, left in sun and moon light out doors for 24 hours. Mud packs with different size, shape and thickness were applied on body areas, then removed after limited time and repeated for weeks, or months according to the disease. Methods of forming (MMT) different packs were formed of cotton sheets filled with prepared mud, or applied on shaved head to form cap of mud. Cotton gloves and socks with no finger or toe septa separation filled with 200-400 mg mud for managing (rheumatic) hands and feet. Direct application of small mud strips on the eyes and bandage on front head used to treat night blindness for 10 months. medical Follow up: blood analysis, sonar, x-ray and other investigations were done. Makka soil samples were analyzed in Egypt, Suez Canal University. It was full of Mn, Ni, Cd Pb Cu, Zn Fe ions and heavy metals. Therapeutic efficiency: Makka dry soil which is formed after rain fall in JAZAN road El kaekea was mixed with tap water or Zamzam water to prepare (MMT) packs and other methods alone or combined was studied for the first time in the present work. **Results:** Improvements in disease progress, better body functions and improved life quality occurred after (MMT), although it was temporary in some cases. **Conclusion and recommendations:** Makka mud therapy (MMT) alone or combined caused improvement of pain sensation and body function with progress in life quality in some health problem studied in this work. (MMT) may be an alternative or complementary treatment in some health problem. However. this is a pilot study and more controlled researches are needed. More improvements of the methodological quality of (MMT) are required. A protocol and guide lines for Makka mud therapy (MMT) alone or combined was founded in this study for the first time. (MMT) is safe, cheap, and save efforts and expenses travelling abroad. It is promising to study the soil of El Madina El Monawara.

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Keywords: Makka, mud, Qoraan, Sunna, disease, methodology, guide lines, pain, life quality

1. Introduction:

The review of literature showed that there were many researches were held, analyzed and concerned with mud, peloid and balneotherapy. (1-3 7) Various types of mud and peloid with different origins and contents were used alone or combined to treat different diseases and relief pain from ancient time. Many methods were applied for mud therapy to manage different health problems. The studies pointed out many molecular, biochemical and thermal mechanisms of mud pack therapy. (1- 17). mud was used in chronic diseases as psoriasis, arthritis, degenerative osteoarthritis (18-22) and rheumatic diseases, fibromyalgia as well as pain relief and relaxation.

There are many Ayat and Ahadith pointing out that the human had been created from mud: in the Quraan: surat Almoumnun -Verse 12.

Surat Taha 55 and Surat alhaj (Pilgrimage) 5 & Surat al Room (Roman) 20.

The analysis of human body composition revealed the similar contents in the body and those in present in mud. mud consisted of different minerals. Organic substances and non organic materials (8 & 15).

Mud had been proved to have a healing power due to its direct mechanical, biochemical, and physical properties as well as anti inflammatory and antitoxic effects. Luis et al 2016.

Besides mineral absorption, mud applications were highly therapeutic due to mud's special thermal properties. Due to its high mineral content, it is storing

the heat very easily when it is warmed – it is thermopexic. The mud is absorbing the water like a sponge, being capable, in the same time, to melt it perfectly – it is hydropexic. The outcome expectations include less pain and swelling over affected areas of the body, which makes it useful in the treatment of edema.

The review of literature made by Luis et al 2016 showed that there were different enzymatic and molecular mechanisms of action of mud pack therapy application, pointing out the reduction in the levels of TNF- α , IL-1 β , PGE2 and LTB4 [1, 2, 3], the increase in the synthesis of noradrenalin, cortisol, beta endorphins and insulin growth factor [4] or stimulation of cartilage metabolism through diverse reactions [5, 4–6].

The effectiveness of mud pack therapy was supported by recent studies comparing its effects with those achieved by another thermotherapy methods and those that showing a possible changes in molecular and enzymatic markers. Changes had been observed in the levels of TNF- α , IL-1 β , PGE2 and LTB4, which were responsible for the inflammatory mechanism and articular pain [7, 3]. The reduction of nitrogen release and reactive oxygen, and other reactions, had been linked to stimulation of the cartilage metabolism [9, 4, 6, and 10]. Bellometti et al. [11] showed an increase in pituitary hormones due to hypothalamic–pituitary axis activation as a response to the thermal stress produced by the high specific heat of the mud pack [9]. The influence on enzymatic activity had also been reported

[12, 14]. Jokic et al. [13] observed a significant decrease in catalase activity and superoxide dismutase after applying mud pack therapy at 42°C, indicating and establishing a direct relationship with pain relief.

However Future studies with an appropriate methodological design should continue to research the influence of Makka mud pack (MMP) therapy on biochemical markers, establishing follow-up periods [11] and analysing cost-effectiveness vs drug therapy, as well as cost-effectiveness of therapy in the same country vs travelling abroad seeking treatment and cure.

2. Material and Methods:

Makka soil analysis:

Makka soil was analyzed chemically especially for the present work and was made in Egypt Suez Canal University Sues Canal.

Head of the Department Prof Dr. Mohamed Ahmed Nasr.

Soil analysis Makka after rain Alkaekea Jazan Road and was full of elements, ions and heavy metals which included Mn, Ni, Cd, Pb, Cu, Zn, Fe.

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No	EC dSm	ph	Cations meq-l					HC O3-	CO3 -2	r 4				
			Ca+	Mg+	Na+	K+								
4	2,16	7,85												
			4.80	3.40	12.93	0.87	9.50		2.60					
							Element	Fe	Ni	Cd	Pb	Cu	Mn	Zn
								38.2886	1.6809	0.0018	0.1842	1.2701	13.4979	2.4517
No			T.N ppm	T.P ppm	T.K ppm				O.M%					
4			175	Trace	240				0.2905					

Makka Mud (MM) preparation

Mud preparation was formed from Makka soil, mixed with tap water or Zamzam water in the room temperature to be semisolid. Then used after 24 hours after exposure to sun and moon light outdoors in open air exposure.

Application of one centimeter mud thickness with different methods on the diseased body areas for hours daily or weekly for weeks or months were tailored according to the patient case. Assessment of body functions as Visual acuity and lens clearance were held according to case needs at base line, after

two weeks and at the end of one month from stating MMT.

Medical Investigations:

Some investigations like x-ray image analysis, ultrasound, CAT scan and blood tests were done and specific tests for nervous system as well as. Pain assessments. Inquiring and questioning the patients and their relatives about the improvement of their life Quality.

Patients and Methods:

It was not reported the therapeutic efficiency of makka mud which was formed after rain fall in JAZAN road El Kaekea. The present work aims to study for the first time a pilot study on the effect of mud therapy on different patients with different ages, sex and various health problems, The study cases were as follows: 1-Night blindness, 2- head injury and hemiplegic after car accident, 3-case was diagnosed as Cerebral palsy and brain atrophy, 4-difficult learning and speech in hyper kinetic child.

Patients and Methods with details:

In the present study: the cases (four) studied were with different age, sex, and had various diseases and health problems:

All the patients had KSA nationality.

Case 1: Adult female patient age around 55 years old, suffering from night blindness. Her vision record before Makka mud packs therapy (MMT) 1.25 in the right and left eye as distance:-. after 10 months treatment with Makka mud packs therapy (MMT) on the head combined with Hijama and medical plants put under feet, her vision record was 2.5 in the right and left eye Her improved vision was temporary, deterioration and regression of vision acuity had occurred when MMT was stopped, and improvement of vision had occurred again when MMT was re-applied again.

Case 2: young teenager female aged 14 years had a car accident and went in coma and severe health hazards and received medical treatment and an complementary (MMT) for one year on her head.

Case 3: New born infant aged 8 months, weighting 5 kilos, suffering from epileptic fits, hydrocephaly and brain atrophy. Chest problems: Asthma and wheezes. The patient suffered from difficult suckling and eye squint as well as impaired some reflexes eye. The patient was treated with mud packs around the head circumflex combined with colostrum, negilla sativa, thym natural honey diets for one month every two hours, and change the packs every one and half hour, and in the night there was no mud packs.

The patient was under Oxygen therapy in (Bakshan>>Hospital) three times a day.

Results of the Makka mud (MMT) complementary therapy combined treatment: There

was improvement in the epileptic fits almost disappeared.

There was improvement in suckling mother breast for feeding. there was improvement in body reflexes and improvement of squint and eye reflexes, Case 4-: from mother (a nurse living in kark in KSA) talk: The history of the disease and treatment of a child 8 years old now, stated when he was 4 years old. Child suffered from hyper active syndrome (ADHA), dissociation, low concentration, difficult learning, difficult speech. Autism was a differential diagnosis K and the child was free from that the child underwent medical treatment and an adjuvant Makka mud therapy (MMT) for two months. The packs were formed of mud mixed with zamzam water, left in the open air for 24 hours to be exposed to moon and sun light.

The head of the child was completely shaved. The mud pack was formed as a cap on the child head with thickness of one cm and left for one hour and repetition occurred of the Makka mud (MM) directly on the shaved head to form head MM cap like pad every 24 hours for two months.

After the two months of therapy with Makka mud (MM) mixed with Zamzam water, the child had improved body functions, and the life quality became better, the child showed more concentration, could speak easier, more fluent less conversation and less hyper kinetic, and he was doing well merging with his friends.

Summary of the results:

All the cases had under gone Makka mud therapy (MMT) either alone or combined. the mud was mixed with tap water or zamzam water. All the cases treated with MMT showed improvement in disease prognosis, improvement in body function and, better well being, relaxation and decrees in pain or pain relief, as well as improvement in quality of life of the cases and their relatives. The therapeutic efficiency of make mud (MM) which was formed after rain fall in JAZAN road El kaekea-KSA was not reported previously. The present work aims to study for the first time a pilot study on the effect of mud therapy on different KSA patients with different ages, sex and various health problems.

New regime Methodology

Proposed combined guideline suggested

In the present study the diseases and health problems caused patient suffering from pain which interfered with work capacity, life quality and body functions as well as mood and psychological changes, However disabling health problems affected the patients relatives as well. Thoses symptoms lead in this work to tailor various types of treatment for each case in different lines of management. Makka mud (MMT) packs formed either by mixing with Zamzam

mineral water, or tap water in room temperature, combined with herbal (sidr, *nigella sativa*), in addition to /or honey, or olive oil, or hijama were used according to each case needs. The treatment duration, and repetition occurred according to each case progress. The type of Makka mud packs, bandages, face masks, eye strips, head cap. Application on the knee. Putting the mud in cotton sheaths full of mud, filling cotton gloves socks with no finger separation with mud, or application of mud on the breast, the abdomen in the form of cotton packs full of mud. Some cases showed temporal improvement for short, medium, or long time after (MMT).

Method used during (MMT)

In the present study different methods and guide lines treatment of Makka mud therapy (MMT) were used:

1- application of mud packs in the form of head cap with one cm thickness after complete head shave to manage a 4 years old boy with hyperkinetic dissociation syndrome with difficult speech and learning was performed.

2- Applying Makka mud packs on the front area of the head, and small strips of Makka mud spread directly with wooden spatula on the eye lids to treat night blindness was held.

3- However in patients suffering from rheumatoid in the hands and feet, cotton hand gloves and feet sox were full of -200-400 gm of mud respectively for each one hand or foot of the pairs of gloves and sox. were used, although the patient did not continue the therapy.

a. Spreading of prepared Makka mud mixed with tap or Zamzam water was performed on different size cotton towels or parts of cotton sheet, then were applied on different body areas included the abdomen. chest, knees, for legs to treat cellulites. A cotton sheet was spread and filled with Makka mud prepared by mixing Makka soil with Zamzam water with one cm thickness. The pad was wrapped around the female thigh, there was loss of thighs thickness.

The Makka mud therapy was prepared by mixing mud with tap or zamzam water, left in moon and sun light for 24 hours, and packs of one c m thickness were formed.

All the patients showed improved body functions, decrease pain sensation. Improved quality of life of them and their relatives.

3. Results

Patients:

Four cases underwent treatment with Makka mud therapy mixed either with tap water or Zamzam water as a complimentary therapy for different diseases for a limited time. Different pack methodology and

different body part application areas were performed by the cases.

Case 1: Adult female patient suffering from night blindness. Her vision was distance:-2.5 in the right and left eye. After 10 months treatment with Makka mud MM packs, (The paks were formend of A SHEATH OF cotton and MM was applied on the cotton sheath) therapy on the head combined with Hijama and medical plants were put under her feet.

Method:

The packs were formed on Makka mud mixed with Zamzam water, the mixture was left for 24hours outdoors to be exposed to moon and sun light, and a small strip like bandage of Makka mud was applied directly on the closed eye lid with (0.5-1) cm thickness on each eye as well as a bigger Makka mud pack was applied on the front of the head.

Results of examination after therapy: Her vision was distance:-1.5 in the right and left eye, but developed cylinder 0,25 in both eyes and axis20.

The patient reported improvement in her vision and quality of life.

However, the night blindness returned after stopping the treatment for three months, and improvement re -occurred when re using Makka mud (MMT) packs, eg the improvement was temporal and related to Makka mud (MMT) therapy, That situation of improving and regression after using and stopping the Makka mud therapy (MMT), was recorded by the patient complain and was proved by vision and eye examination. Improvement had occurred after Makka mud therapy (MMT), then deterioration occurred after ceasing mud therapy.

Case 2: Young adult female patient suffered from severe head injury and coma travelled to hospital after car accident in the year2005.

Her medical reports in different SAUDI ARABIA (KSA) Hospitals were as follows:

Physical findings: the patient was incubated and ventilated. BP: 140/90 PULSE 100/MIN Temp: 37.7.

Neurologically she was comatose with Glasgow coma score of 5/15withleft sided hemi paresis with face edema and left raccoon eye. The pupils showed right RRR pupil and left dilated non reactive pupil (traumatic mydriasis). There was evidence of bleeding from nose and subleagal hematoma in the left side.

Investigations:

Hb, WBC, HCT, SGPT, SGOT. Urea creatine, bleeding profile, repeated Na, Ca, Serum osalirity, CBC and chest X ray. **Skeletal** survey, NAD.

CT scan brain: multiple fissure fracture with simple parietal depressed fracture, right parietal area of brain contusion and **brain edema**. Follow up C T scan revealed enlarging right fronto-temporal subdural hygroma with mass effects.

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The patient received **medical treatment especially antibiotics**, physiotherapy and an adjuvant complement therapy by (MMT) mud packs put around the circumference of the head for one year in the following regime:

Three times application of Makka mud packs (MMP) on the head circumference for three hours, daily and the fourth applied **mud pack** was kept on the head and the patient slept all-night with the Makka mud (MM) pack which thickness was one cm. Combined therapy with hijama occurred and herbat treatment and honey.

Follow up:

Minimal right subdural hybroma.

Hospital report:

No more depressed bone could be seen.

Right temporo-parietal hypodense (sequence of contusion): The initial diagnosis was.

On the year 2007 Patient state .

The patient had left sided upper motor neuron (UML) findings, lefts side hemi paresis. Her vital signs were within normal LIMITS. Systemic examination was unremarkable.

The patient was recommended to have occupational rehabilitation and physiotherapy.

On the year 2018 Patient state

The patient continued until now is rehabilitation and physiotherapy. The patient is now a college student graduate, the dysarthria had been less. the hemiplegic symptoms and signs decreased. though unstable gait similar to that of Parkinsons could be noted. Patient can speak slowly and with slight difficulty. However there had been improvement in fixing and adjusting the course and fine adjustment of the hand clock watch to point out the exact time by hours and seconds. The patient could not fix the hand watch before combined medical and physiotherapy (MMT).

Case 3: New born female infant aged 8 months, weight ing 5 kilos, suffering from epileptic fits. hydrocephaly and brain atrophy. Chest problems: Asthma and wheezes. The patient suffered from difficult suckling and eye squint as well as impaired some reflexes eye.

The patient was treated with mud packs around the head circumflex combined with colostum, negilla sativa, thym natural honey diets for one month every two hours, and change the packs every one and half hour, and in the night there was no mud packs.

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The head of the child was completely shaved. The mud pack was formed as a cap on the child head with thickness of one cm and left for one hour and repetition occurred of the Makka mud MM application on head to form a head mud cap like pad every 24 hours for two months.

After the two months of therapy with Makka mud mixed with Zamzam water, the child had improved body functions, and the life quality became better, The child showed more concentration, could speak easier, more fluent less conversation and less hyper kinetic, and he was doing well merging with his friends. The quality of the life of the child relatives had improved.

4. Discussion:

What is The Geology of Makka Soil and How was The Mature Makka Mud (Mmt) Efficient Therapeutically

In the present study the mud used for therapy was from Makka mud JAZAN road El kaekea. Makka mud analysis showed that it was full of minerals and heavy metals as and it was full of elements: Mn, Ni, Cd, Pb Cu, Zn Fe And ions and heavy, that was in accordance of the surrounding rocks and mountain geology in the ail road, which dissolve after rain fall. The mineral content might be the effective therapeutic component.

That agreed with what Quraan mention suret Fater verse 27. In the present study the mud used was formed by mixing tap water or Zamzam water with Makka spoil from Kaekea area. That combination brought about synergistic effects and formed a combined therapy what was similar to the finding of Mihelčić et al., 2012 who studied the Physico-

chemical characteristics of the peloid mud from Morinje Bay (eastern Adriatic coast, Croatia): suitability and for use in balneotherapy. They mentioned that.

The study conducted in the Morinje Bay (Central Dalmatia, Croatia) included the investigation of the sedimentological, physico-chemical and geochemical properties of the Morinje Bay sediments in order to assess the suitability of the material for wellness-related purposes including medicinal use. The sedimentological characteristics of the Morinje mud were in accordance with the geological origin of the material; the sediment was fine grained, composed mostly of carbonates, quartz and clay minerals. The composition of the sediment determines the physico-chemical properties of the mud. The high content of carbonate minerals diminishes adsorbing the characteristics of the mud to some extent; however, they were still comparable to some commercial mud already successfully used for medicinal purposes. Geochemical analyses had shown that trace metals concentrations in the Morinje Bay samples were mostly in the range with similar material from unpolluted Adriatic environments. Only the concentrations of Cu, Pb, Zn and As were slightly higher than in the reference material, but still within acceptable limits.

In the present study the mud mixed with water was left in the sun and moon light for 24 hours before used for therapy. That exposure to open air and sun and moon light, as well as sun warmth lead to the formation of living mud (mature mud or mature peloid) that was full of planktons and growing microorganisms that produce organic materials that might form part of the therapeutic efficiency of the Makka mud therapy.

That coincided with Curri et al., 1779 who observed and studied organic components of thermal mud: morphohistochemical and biochemical studies on lipid components of mud of the Terme dei Papi (Laghetto del Bagnaccio, Viterbo). They mentioned that in previous findings the lipidic fractions extracted acc. to Folch from the mature muds of the majority of the Italian thermal springs hot baths was studied, with the aim to identify the organic substrates of their therapeutical activity. The organic components of the "mature" peloids were produced by the metabolism of the microphytozooplankton growing spontaneously in the clay-substrate, in contact with the hot water. The Popes thermal springs (Bagnaccio's Lake) were characterised by an unique environmental situation, because the muds were naturally matured in the hot thermal water, but not in artificial baths. The morphohistochemical aspects of thermal algae growing in the Bagnaccio's lake had been studied by means of Computerised Optic Probe Video-

Microscopy, using a not contact zoom objective 70-400x. Peloid types, both the "white" and the "black" contains yellow pigments, fragments of hyphae, monocellular algae, Diatomeae, Cyanophyceae and few other species. The biochemical aspects of the muds extracts were characterised by the presence of Phospholipids (PC, PE, PS, SP), a series of Hydrocarbons ranging from C30 to C38, Phytosterols (beta-sitosterol, Campesterol, Stigmasterol and traces of Cholesterol), Free Fatty Acids (Palmitic, Palmitoleic, Myristic, Stearic, Oleic and Linoleic, heptadecenoic and heptadecanoic) and Terpenes (beta-amirrhine, 24-methylene-cyclo-arthanole). They added that in their opinion, the therapeutic effects of the mature muds were related to its organic components, with special regards to Phospholipids, Phytosterols and Terpenes. The richness of these components in the Popes Thermal springs seemed to be great interest in the dermatological and cosmetic applications, other then the traditional use.

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3-However in patients suffering from rheumatoid in the hands and feet, cotton hand gloves and feet sox were full of -200-400 gm of mud respectively for each one hand or foot of the pairs of gloves and sox. were used, although the patient did not continue the therapy.

4- Spreading of prepared Makka mud mixed with tap or Zamzam water was performed on different size cotton towels or parts of cotton sheet, then were applied on different body areas included the abdomen chest to treat cancer breast, knees, for thigh and leg to treat cellulites. A cotton sheet was spread and filled with Makka mud prepared by mixing Makka soil with Zamzam water with one cm thickness. The pad was wrapped around the female thigh, there was loss of thighs thickness.

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The need of advanced methodology

Those methods were practically applied after the nurse Salwa Saker and were revised theoretically by Prof Dr Abd wahab M G by as a preparatory simple

method, more Improvement of the methodology and guide line of treatment are needed. Mud (MM) bathes and pre-prepared mud packs of various sizes could be suggested and looking forward.

In the present study MMT long, medium size, short length of cotton sheets were filled with mud to be applied on different body areas, Cotton Gloves and sox filled with 200-400 mg mud were used for diseased hands and feet, direct application of mud on eye lids and front of the head using wooden spatula was to manage night blindness, More improvements of the methods of MMT are needed, For example ready pre-prepared disposable packs could be manufactured and used. Pre prepared Makka mud mixture filled in different disposable cotton caps could be used put in plastic containers and could be sold.

The need of advanced methodology and techniques agreed with 20-24 who reviewed the methodology of mud therapy Porcheret et al., 2007(20) in collaboration with the primary care rheumatology Society developed an evidence-based model of care to treatment of knee pain in older adults in primary care In balneotherapy as an effective intervention [23]. These results agree with those obtained by Bartels et al. [2] on the need to carry out randomized controlled trials that reflect the potential effects of specific techniques. Studies of Fraioli et al. [21] and Evcik et al. [22] were classified as having a high risk of bias, as neither article specified the presence of a blinded researcher, blinded patient or randomization. The first of these studies also showed an uncertain intervention for the control group and the second had a small sample size and did not establish dropouts during follow-up.

Nevertheless, there are also studies with a high-quality methodology, like the one from Flusser et al. [23] that assessed functional capacity gained through the application of mud packs with different quantities of mineral components included in the mixture. The only limitation of the study was the lack of homogeneity in population distribution.

Pain sensation after (MMT)

In the present work there was improvement in pain and quality of life after (MMT) in all patients with different degrees. The longer the duration of MMT, the better improvement in decrease pain sensation, That was in accordance with the studies that analyze the effects of mud therapy on pain (24-31).

Many investigators [(24-31)] had analysed the effects of mud pack therapy on body functions and pain perception, and in some cases the influence on the need for medication []. All the reviewed studies used a visual analogue scale (VAS) assessment of pain as the measurement tool The duration of the intervention ranged from 2 to 3 weeks. The studies' main objective was to analyse the effects of mud

therapy on pain, basing the methodological design on the establishment of a comparison of the benefits of a physiotherapy and balneotherapy treatment and where the previous therapy was applied but mud therapy was added. Others analyzed perceived pain through a mud-based therapy and through an association of mud therapy and drug therapy, or simply through a control group.

In the present study pain sensation and improved body functions had occurred after natural Makka mud packs therapy (MMT). The longer the (MMT), the more the improvement in function and pain sensation. The results of the present study coincided with the study of Flusser et al. who showed an 11.07% improvement with the application of natural mud pack therapy. The improvement was maintained during a 3-month follow-up period.

The results of the present study agreed also with Vath et al. [29] who pointed out that the duration of the intervention influences pain intensity. The perceived pain was less in individuals to whom the treatment was applied for 12 days than in those who received a 6-day application. This improvement has been related to specific changes found in biochemical markers that were involved in articular cartilage degeneration [3 2, 35].

Effects of MMT on the Quality of life:

In the present study MMT, the quality of life had improved in the patient and their relatives after improved health problems and body functions.

That agreed with [5,28,31] who studies of the impact of mud pack therapy on the quality of life of patients with knee OA Unlike the previous reviewed variables, the measurement tools used were heterogeneous In a study of 349 subjects diagnosed with knee OA, Forestier et al. [5] estimated an improvement of 54.4% for the experimental group after 3 weeks of treatment compared with an improvement of 29.7% obtained by the control group according to the outcomes of the SF-36 (short form health survey) questionnaire that was used. Yilmaz et al. [31] studied a smaller group of subjects (n = 46) during a similar intervention period and using the same assessment scale. The improvements obtained were at least 10% in each dimension that constitutes the questionnaire. Fioravanti et al. [30] analysed in one of their studies the perceived quality of life for a subject with knee OA who receives mud pack therapy treatment. The subjects of the study (n = 80) were randomly divided into two groups (experimental and control) and the first received daily treatment for a total of 2 weeks. The results showed an improvement in the quality of life close to 30%. Finally, Evcik et al. [22] applied the Nottingham Health Profile (NHP) questionnaire to three study groups and obtained an improvement in pain and sleep dimensions in all the

groups, showing better results in the group of subjects who received a treatment of mud pack therapy and thermal baths.

Conclusion and recommendations:

Makka mud therapy (MMT) alone or combined may be an alternative or complementary effective treatment in clinical disease management and health problems, although MMT was temporary in some cases. However, this is a pilot study and more controlled researches are needed. More improvements of the methodological quality of (MMT) are required. A protocol and guide lines for Makka mud therapy (MMT) alone or combined was founded in this study for the first time. (MMT) is not expensive and save efforts and expenses travelling abroad. It is promising to study the soil of El Madina el monawara.

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