

## Letter to the Editor

## Absence of Evidence or Evidence of Absence?

Dear Editor,

In his opinion,<sup>1</sup> Dr. Nayernouri, giving related and unrelated proofs and analogies from particle physics to astrophysics, attempts to convince the reader that traditional Iranian medicine (TIM) is not an acceptable way of practicing medicine. Most of his claims are based on the belief that there is no scientific rationale behind the TIM, but as a reader, I wish I could find an evidence-based argument to support his own assertions. He further states that the resurgence of interest in traditional medicine over the past years is “partly due to the fact that certain illnesses... cannot yet be cured by modern medical treatments and so people with such afflictions grasp at the straws that any non-conventional medicine may offer, but so far, there is no real evidence that their suffering has been mitigated by such means.”<sup>1</sup> If we even accept that there is no evidence supporting TIM, it does not mean that the treatment is not useful—absence of evidence is not evidence of absence.

In fact, the phrase “there is no evidence to suggest” is one of the most commonly used ambiguous phrases in the literature of evidence-based medicine.<sup>2</sup> For example, the phrase may be interpreted as “this has been proven to have no benefit” (corresponding to evidentiary bases of US Preventive Services Task Force [USPSTF] grade D), which has far different implications compared to alternative meanings such as “scientific evidence is inconclusive or insufficient” (corresponding to USPSTF grade I) or “this is a close call, with risks exceeding benefits for some patients but not for others” (corresponding to USPSTF grade C).<sup>2</sup> In a systematic review of randomized controlled trials published in *BMJ*, the authors found no evidence supporting that use of parachute can prevent death and major trauma related to gravitational challenge.<sup>3</sup> Of course, here, it is not reasonable to interpret the “absence of evidence” as the “evidence of absence.”

I do agree with Dr. Nayernouri that scientific facts should be tested through scientific methodology and clinical trials. It is noteworthy that one of the very first controlled clinical trials was conducted by Rhazes, long before the establishment of modern medical sciences. In his book, *Liber Continens* or *Al-Hawi*, Rhazes describes his controlled trial designed to determine the effect of bloodletting on the outcome of patients with meningitis.<sup>4</sup>

I am personally not a fan of TIM, but I believe it is not reasonable to reject all aspects of an old school of medicine solely based on assumptions. Even if like some scholars, such as Dr. Vessal, we believe that modern medicine is indeed continuation of traditional medicine,<sup>5</sup> rejecting all parts of the paradigm becomes more problematic. Unlike what Dr. Nayernouri mentioned, classical mechanics have not been replaced by the theory of relativity; even now, scientists use the classical Newtonian mechanics to design the path of a space probe in interplanetary travel programs. We should not see things as black and white.

**Conflicts of Interest:** I have no conflicts of interest.

Farrokh Habibzadeh MD  
Farrokh.Habibzadeh@theijoem.com

## References

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Reply;

## Absence of Evidence or Evidence of Absence

Dear Editor;

I am grateful to Dr. Habibzadeh for his comments regarding my essay as it has given me the opportunity to clear up some of the misinterpretations that may have ensued from my opinions.

Apparently, Dr. Habibzadeh could find “no evidence-based argument to support the assertions” in my essay and he considers this as ‘absence of evidence’.

My attempt was to show that throughout the past few centuries, our knowledge of the external world had increased through the advances made in scientific fields, including medicine, and that various ‘beliefs’ or dogmatic assertions made by ancient ‘sages’ have been demonstrated to be untenable. I also attempted to give some solid illustrative examples of these shifting ‘world views’ for those readers who might have difficulty following theoretical and conceptual developments.

To be misunderstood shows a lack of explanatory ability on the part of the author; to be misquoted is a misdemeanor on the part of the critic; but to be misinterpreted shows a lack of comprehension on the part of the reader.

I will systematically answer some of Dr. Habibzadeh's criticisms below:

1. I have given no proofs or analogies from ‘Particle physics’ nor have I mentioned ‘astrophysics’ in my article. I did, however, give an example of ‘classical astronomy’ from the ‘geocentric’ views of Ptolemy to the ‘heliocentric’ concept propounded by Copernicus and his followers including Kepler, Galileo, and Newton who rationalized celestial mechanics. This example was chosen to illustrate the evolution of ideas through centuries of observation and rationalization culminating in a ‘Paradigm shift’ to offer a better model of reality. ‘Astrophysics’ is a completely different ‘kettle of fish’. Dr. Habibzadeh is of course welcome to maintain the ‘geocentric’ view if he finds it more reassuring. My only mention of ‘particle physics’ was in passing with relation to an understanding of the structural model of chemical elements tabulated by Mendeleyev. If this model of chemical elements is offensive to the sensibilities of the practitioners of Traditional Medicine who maintain the reality of the four basic elements of Air, Fire, Water and Earth together with the quintessential element of soul, then perhaps I and others, including Mendeleyev, owe them an apology.

2. ‘Absence of evidence as evidence of absence’: This phrase

is a sophistry; a ruse to question any observational statement. The philosophers of science, from Francis Bacon to Karl Popper and Lakatos have attempted to clarify acceptable evidence and I refer Dr. Habibzadeh to their works. Evidence-based medicine (a phrase which I have used only once in my essay) means that any medical practice must be shown to be more effective than a 'sham' procedure or a placebo. I have emphasized that if Traditional Medical practices are to be given serious consideration, then they must be judged by the same rigorous criteria that modern medical procedures have to undergo. I have also emphasized that the medical knowledge of today does not purport to be complete and it is certain that in the future we shall have better understanding of diseases and methods of treatment than we have today. This fact was stated clearly by Razi as I have quoted in my article. I must also mention that scientific methodology rests on a rational process of theoretical model making which is then tested by experimental observations which might support or falsify that model in which case the model is discarded. Although this 'scientific process' may not be the best methodology that might exist, but so far it seems superior to any others that have existed.

3. Dr. Habibzadeh quotes two 'tongue-in cheek' articles [his reference 2 and 3] in support of his 'absence of evidence' argument but it seems that he did not appreciate their sense of humor. The article by Smith(GCSS) and Pell (JPP) parodied the fact that no "double blind, randomized, placebo controlled, crossover trial" had been carried out to determine whether it was safer to jump out of a flying airplane with or without a parachute. I shall quote their end note verbatim in order to highlight their jocularity: "Contributors GCSS had the original idea. JPP tried to talk him out of it. JPP did the first literature search but GCSS lost it. GCSS drafted the manuscript but JPP deleted all the best jokes. GCSS is the guarantor and JPP says it serves him right". This article may have been written on the first day of April (Fool's Day) and may have been delayed in publication. Braithwait's article [his Ref. 2] is in a similar vein but not so humorous. Quoting these articles reflects badly on Dr. Habibzadeh's sense of humor as well as his judgment.

4. The fourth article Quoted by Dr. Habibzadeh is by Selma Tibi which refers to Razi's performance of a controlled trial to determine the effect of bloodletting on the outcome of patients with meningitis. Both in my present essay and my previous article concerning Zakariya Razi,<sup>1</sup> I have praised Razi "as one of the most advanced thinkers of his time, both in his logical and empirical methodologies" and have described him as "a true scientist in its modern connotations and even superior to many who followed him in the succeeding centuries...". I wish that some of the advocates of Traditional Medicine would follow in his footsteps and keep an open mind to embrace new knowledge rather than continue to regurgitate Galen and his followers.

5. In his editorial, Dr. Vessal<sup>2</sup> begins with the sentence "Traditional medicine is the repertoire of cumulated medical experience of a given civilization", with which I totally agree. I have written in my essay that "to write about and teach the *history* of Traditional

Iranian Medicine as part of our heritage is commendable, but to teach it as a practical science and recommend its theories, methods and practices to replace or even to supplement modern scientific medicine is tragic and retrogressive". I wonder if Dr. Vessal's child had meningococcal meningitis, he would agree to a series of bloodletting procedures in lieu of antibiotics. I also beg to differ with his statement of the "low cost of the locally available skills and medicinal herbs". Traditional Iranian medical practitioners charge the official government approved fees for all medical consultations (and sometimes more), and simple herbal medications are no longer necessarily cheaper than non-proprietary brands. Furthermore, no one is trying to reinvent the wheel but again no one would attempt to fit a wooden chariot wheel of 2000 years ago on a Formula One Ferrari. The concept of treating the ill has not changed but the means and methods have advanced. The aim of medical practice is to treat illnesses to the best of our present abilities and techniques but not with a broken wooden wheel.

6. Dr. Habibzadeh is correct in pointing out that calculations for "space probes in interplanetary travel programs..." are based on Newtonian Laws of Motion and Gravitation, and therefore, maintains that they have not been replaced by the theory of relativity. Although a discussion of physics or pragmatism fall outside the subject matter of my article, I feel compelled to digress. The Newtonian laws of motion and gravitation are perfectly adequate for terrestrial objects and planetary trajectories, but are absolutely inappropriate for the physics of the very small (quantum mechanics) and the gravitational effects of the very large (from stars to black holes). For Newtonian physics, space and time have absolute values, but in Einstein's relativistic concepts, Space and time are woven into a single continuum (space-time) which can be distorted (warped) by a large gravitational field. They are both parts of modern scientific concepts but with different applications. We can still use a grandfather clock to tell the time of day but we need 'atomic clocks' for Global Positioning Systems (GPS). We do not necessarily discard useful objects or ideas because they have been superseded by conceptually or technologically more advanced mechanisms, but we must be confident of their *utility*. Traditional medicine *must demonstrate* its utility in order to have a place in our medical practice.

And finally, although I have attempted to answer most of Dr. Habibzadeh's criticisms to the best of my ability, yet I remain unclear as to their relevance to the main thesis of my article. I do recommend, however, that he should reread my essay more carefully.

Touraj Nayernouri  
Iranian Academy of Medical Sciences, Tehran, Iran.

## References

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