

The Wim Hof Method: Ice Baths, Risky Breathing, and the Goop Lab

The Wim Hof Method consists of breathing exercises and cold baths, promoted as a key to good health and a cure for all ills. There is, however, no good evidence that the Wim Hof Method cures anything—and, in fact, the breathing exercises may be dangerous.

MARTIN BIER

In the winter of 2014, neighbors and passersby wondered why Wubbo Ockels was submerging himself in the cold and dirty water of the canal in front of his house in Amsterdam. Wubbo was a celebrity in the Netherlands. In 1985, he was part of the crew of the space shuttle *Challenger* and became the first Dutchman in space. He had an engaging personality. After his space mission, he was often seen on TV and hosted a popular science show. He also advocated for sustainable development and green energy projects. It was after getting a diagnosis of kidney cancer that he turned to “Iceman” Wim Hof.

Hof had long been interested in yoga, meditation, karate, extreme physical feats, etc. He was already well in his forties when well-publicized stunts involving extreme cold brought him fame. He swam 200 feet under ice. Bare-chested and bare-footed, he ran half marathons in subzero temperatures. On several occasions, he spent about two hours in a tank filled with ice cubes while wearing only briefs and with just his head sticking out above the ice. More than once, the stunts landed him in the emergency room and even the intensive care. It all led to Hof being a household name in the Netherlands by 2010.

Style and approach shifted around Hof’s fiftieth birthday. The circus and spectacle were toned down. Instead, research and education were brought to the foreground. The stuntman morphed into a guru. In 2011, the company Innerfire BV was founded, and the Wim Hof Method became a brand. Cold exposure and breathing techniques were sold as a key to health and happiness. Hof became a motivational speaker; he began organizing workshops and took on consulting work. Customers could join Hof on a one-week midwinter retreat in the Sudeten Mountains in southwest Poland. There yoga in the snow, jumps in freezing ponds, and strenuous hikes wearing only shorts were on the program.

Wubbo Ockels joined on such a retreat in February 2014. Shortly before the trip, Ockels, Hof, and a handful of other devotees of the Wim Hof Method appeared on an authoritative Dutch TV talk show (<https://www.bnnvara.nl/pauwen-witteman/videos/258284> in Dutch). Ockels reports there that he is feeling great, but that he is joining the expedition to

Poland so the immune system can finish with the complete cleaning of all the cancer. Two other people at the table—a multiple sclerosis patient and an arthritis patient—describe how the Wim Hof Method gave them back a normal life.

Hof next points out that the method has three pillars. First, there are the breathing exercises “through which you go deeper into the nervous system.” Next, there is the getting used to cold “to train the cardio-vascular system which leads to stuff reaching the immune cells.” And finally, there is the mindset: “neurotransmitter making better connections with the body.”

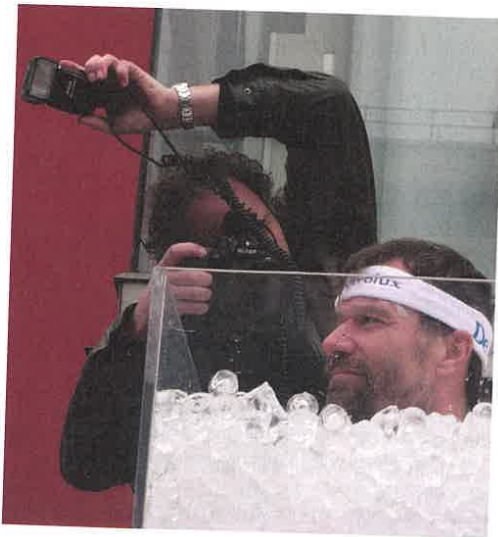
When pressed by the interviewers, Hof denies that he is making any hard medical assertions. But the disclaimer is followed by an account of how medical doctors refer people to him that they have given up on and how Hof turns these patients into success stories. He talks about “waking up powers that are inside every human being” and how “you are the miracle that you can cause yourself.”

Just three and a half months after the broadcast, on May 18, 2014, Ockels died at sixty-eight. In an interview in July 2014, Hof said “I never claimed that I was able to cure him, only that I could make him stronger ... he was too far gone already” (Zuidweg 2014).

Cryotherapy and Risky Breathing

It is a cliché that a therapy or theory must be valid if it has survived for a long time. But bloodletting and astrology show that this idea is mistaken. The best way to establish the effectiveness of a medical treatment is a double-blind clinical trial with a control group. About half of the subjects receive the “real thing” (e.g., an active ingredient) while the other half receives a sham treatment or placebo. The “double-blind” means that for each individual case, neither the patient, nor the treating physician, knows whether what is administered is real or fake. In the end, it is the statistician who gets all these data plus the outcomes. The statisticians know who is in which group, and they ultimately figure out whether the real treatment has a statistically significant edge—that is, whether or not it is effective.

It was in the 1980s that “whole body cryotherapy” was



A demonstration by "Iceman" Wim Hof in Rotterdam on March 24, 2007. Source: aad | Flickr.

first studied with a degree of scientific rigor. With special cold-air chambers in which all variables are under control, clinical studies were undertaken. The Wikipedia page about cryotherapy describes some of the outcomes. No spectacular results emerged. An obvious obstacle to getting hard conclusions is, of course, that no sham or placebo is possible when the treatment consists of exposing the patient to extreme cold. Many studies involved just a few patients and could only be considered preliminary. Evidence of the efficacy is lacking, and there are actual risks associated with exposure to cold. In short, the possible benefit is not worth the risk.

Breathing is the other pillar of the Wim Hof Method. Participants are instructed to breathe deeply and rapidly, i.e., to hyperventilate. After doing so for a few minutes, they are supposed to hold their breath for a few minutes. *Hypoventilation* is the medical term for this. Medical science may not exactly know all the effects of application of extreme cold, but what hyperventilation and hypoventilation do is very well understood.

Suddenly holding your breath after a bout of heavy breathing, i.e., hypoventilation after hyperventilation, is particularly hazardous. Hyperventilation leads to the lungs holding a high oxygen concentration and a low carbon dioxide concentration. Upon next holding one's breath, the oxygen concentration decreases as the carbon dioxide concentration increases. It is then possible that the oxygen concentration gets too low before the carbon dioxide concentration gets sufficiently high to give a strong impetus to take a breath. Passing out is the result. Many healthy people have drowned through what is commonly called shallow-water blackout.

Instructing people to hyperventilate or hypoventilate in the vicinity of baths or pools—especially alone—is a very bad idea.

Support from Celebrities and the Goop Lab

The Netherlands is a small country. It has eighteen million people and is about twice the area of New Jersey. You cannot be world famous just in the Netherlands; taking your venture to the land of opportunity is the next logical step.

The American endeavors of Hof and Innerfire BV have been fruitful. Cold baths are becoming more fashionable in America and the name Wim Hof rapidly pops up when searching "cold bath." Hof's 2020 book *The Wim Hof Method* made *The New York Times* bestseller list, and he has been interviewed on *The Joe Rogan Experience*. He has also made appearances on shows of Russell Brand and Jordan Peterson. Celebrities such as Kendall Jenner, Madonna, and Lizzo have all become ice-bath-devotees and Hof followers. Even quality news outlets such as *The New York Times* and the *Smithsonian* feature articles about the trend—articles with very little critical analysis and a lot of enthusiastic adulation (Learn 2018; Williams 2022).

The biggest success was when, in 2020, Hof was the central figure in the second episode of the Netflix series *The Goop Lab with Gwyneth Paltrow*. The Goop Lab has taken the advancement of dubious health claims to a new level, and it has already been much discussed (Palmer 2020). Of course, the show is supposed to "entertain and inform" and not provide "medical advice." But—as with the Dutch talk show—the upfront disclaimer comes across as absurd when the next half hour is just an unashamed promotion of the Wim Hof Method with intermittent breaks for two-minute testimonials of happy patients.

Like myself, Hof was born in 1959 in a lower-middle-class environment in the Netherlands. At the age of twelve, he was sent to vocational school. He has no formal medical or scientific training. His background is far removed from the wealthy and wellness-obsessed California of Gwyneth Paltrow. Dutch culture does not feature self-help books at the check-out counter of the grocery store. "Act normally, that's already crazy enough" is as much psychobabble as you may ever encounter in the Netherlands.

It is therefore all the more astounding to see how smoothly Hof relates to Paltrow and her team when he appears on the show. His huge size and crude appearance form a sharp contrast with Paltrow and her associates. Hof gives Paltrow a hug and blazes with self-confidence as he proclaims utter nonsense about immune systems and hormonal imbalance. His meaningless verbosity is interspersed with guru platitudes about how he is merely helping people in the development their own potential. We hear things such as "You become the alchemist of life itself" and "Follow your feeling. Your feeling is the guide. Don't force the guides." Halfway through the show, we see him do yoga barefoot in the snow. "Snowga" is what this is apparently called.

Hof instructs Paltrow and her entourage to do the rapid heavy breathing routine. Paltrow ominously mentions twice that it makes her feel like she is going to pass out, but nothing is made of this. Just once during the breathing exercises, Hof tells the group that they should not do it while driving

or when in a pool. However, not much later we see how the same people do exactly this kind of breathing right before a winter jump into Lake Tahoe.

Already in 2016, an article in the Dutch newspaper *Het Parool* listed pool drownings that were possibly related to Hof's breathing exercises (Duin 2016). Problematic is of course that an autopsy cannot reveal whether a drowning was preceded by Hof's breathing regimen. Therefore, evidence that these exercises were involved was circumstantial.

Devotees, Apostasy, and Claims of Abuse

Devotees of the Wim Hof Method eagerly point to an article that appeared in 2014 in the prestigious *Proceedings of the National Academy of Sciences* (Kox et al. 2014). There it is reported how Dutch scientists recruited twenty-four volunteers. Twelve of them received an extensive ten-day training program in the practices of the Wim Hof Method, and the remaining twelve were the control group. Group assignment was random, and some beneficial effects of the training were found. But the setup of this trial was of course far from double blind, and *demand characteristics* biases may be a serious issue here. This phenomenon is well-known among clinicians and refers to the fact that participants may modify their behavior and responses if they are aware of the experiment's purpose. Commonly, subjects want to be cooperative and contribute to an experiment's success.

The Wim Hof Method is like chiropractic, homeopathy, and acupuncture in that it pretends to be a health-and-healing system that is based on science. But more than these other dubious approaches, the Wim Hof Method comes with religious ritual and a personality cult. In the *Goop Lab* episode, we see how six people do the breathing exercises while lying stretched out on the floor in a circle with the feet all together in the center of the circle. In other videos, we see rituals that are mindful of baptism. Hof is always center stage. In the *Goop Lab* episode, Paltrow introduces him as "the living example of mind over matter." Not much later, Hof is given prophet status when she asks him "Do you ever think about why you are the chosen person to discover this and brought it to the world?" Hof's answer is a cliché: "I see my function now: to help millions and millions of people." In the *Goop Lab* episode and in many other videos and articles, Hof recounts how he suffered a traumatic loss when he was younger and how he was a lost soul until he found redemption through The Method.

As is common in cults, it is inevitable that apostates emerge. Scott Carney is an American journalist with a record of debunking quackery and pseudoscience. He initially took this critical attitude to Hof, but he ended up being converted and writing an enthusiastic book about Hof and The Method (Carney 2018). However, ultimately he turned, and, in 2023, he created a critical website about the Wim Hof Method and the surrounding culture (see scottcarney.com).

September 2024 brought new developments. Hof's ex-wife and their children came out with their story. Two journalists from the Dutch newspaper *De Volkskrant* had done a

thorough investigation and published a long article. A free English translation of the article was made available by the newspaper (<https://www.volkskrant.nl/kijkverder/v/2024/the-outside-world-knows-wim-hof-as-the-eccentric-iceman-his-family-suffered-domestic-violence-v1176564/>). In short, Hof terrorized his family. Police reports, hospital records, court documents, and emails back up gruesome stories of abuse and domestic violence. At this point, it remains to be seen to what extent these revelations will hamper Hof's international exploits.

There is nothing wrong when someone feels reinvigorated after a cold bath or shower and makes it part of a daily routine. Likewise, meditation is a wonderful thing if it makes someone feel or function better. But the Wim Hof Method is based on poorly substantiated claims about health benefits of an exercise regimen that may be actually hazardous.

For over thirty years, Wubbo Ockels stood for science, engineering, and common sense. It is sad that, in the end, he became one more instance to illustrate that critical scientific judgment toward poorly substantiated medical treatment is often thrown out the window when faced with fatal disease and imminent death. And it's also sad that there are always those who appear willing to recklessly profit from the despair of people that face a serious health crisis. ■

References

- Carney, S. 2018. *What Doesn't Kill Us: How Freezing Water, Extreme Altitude, and Environmental Conditioning Will Renew Our Lost Evolutionary Strength*. Emmaus, PA: Rodale Books.
- Duin, R.J. 2016. Oefeningen Iceman Wim Hof Eisen Slachtoffers. *Het Parool* (May 28). Online at <https://www.parool.nl/nieuws/oefeningen-iceman-wim-hof-eisen-slachtoffers-be5fa5d0/> (in Dutch).
- Kox, M., et al. 2014. Voluntary activation of the sympathetic nervous system and attenuation of the innate immune response in humans. *Proceedings of the National Academy of Science* 111(20): 7379–7384. Online at <https://www.pnas.org/doi/full/10.1073/pnas.1322174111>.
- Learn, J.R. 2018. Science explains how the Iceman resists extreme cold. *Smithsonian Magazine* (May 22). Online at <https://www.smithsonian-mag.com/science-nature/science-explains-how-iceman-resists-extreme-cold-180969134/>.
- Palmer, R. 2020. A psychic fraud investigator weighs in on the Goop Lab. *SKEPTICAL INQUIRER* (February 17). Online at <https://skepticalinquirer.org/exclusive/a-psychic-fraud-investigator-weighs-in-on-the-goop-lab/>.
- Williams, C. 2022. Cold water plunges are trendy. Can they really reduce anxiety and depression? *The New York Times* (February 21). Online at <https://www.nytimes.com/2022/02/20/well/mind/cold-water-plunge-mental-health.html>.
- Zuidweg, M. 2014. Zomerinterview (1): Wim Hof. *VOX Magazine* (July 14). Online at <https://www.voxweb.nl/nieuws/zomerinterview-1-wim-hof> (in Dutch).



Martin Bier is a professor of physics at East Carolina University. At the age of twelve, he devised a way to fly on his bicycle. But not much later he figured out that the design involved violations of basic laws of physics. Later again, he obtained advanced degrees in physics and mathematics from the University of Amsterdam and Clarkson University.