Mindfulness and a Healthy Body

Since February 17, 2022, there have been a series of talks on the theme “How Do You Want to Live?”, and this talk concludes that series with a focus on how contemporary scientific research explores the ways regular mindfulness of breathing meditation increases a person's physical well-being in a variety of ways.

The discussion will explore how persistent attention to the sensations of breathing alters the functions within the brain that are associated with a variety of processes elsewhere in the body, involving pain management, stress reactivity, immune response, metabolism and perhaps even longevity.

The ability to skillfully manage one’s physical health and well-being goes beyond the importance of staying healthy—as we grow older in this culture, the social costs of illness and physical decline are mounting. If we don’t as individuals become proactive regarding our own health, the large-scale impacts regarding health insurance and Medicare are mounting. Insurance companies increase their rates and Medicare may go bankrupt as a result of ineffective health routines. Additionally, the larger societal costs associated with poor health practices cause significant disruption to our cultural well-being; the consequences of the covid-19 pandemic are just a precursor to what can happen as current trends continue. A large segment of the population is obese, lacking in exercise, good nutrition and adequate sleep, and all of these contribute to one’s vulnerability to chronic illnesses.

I was diagnosed with Type 2 diabetes in 1999, despite reasonable fitness. This occurred because of a genetic predisposition to the disease—my father died from complications related to it, plus other issues associated with his poor health routines. I determined not to repeat this, and my response to the disease was strengthened by my already existing meditation practice, plus my lifelong history of physical activity—my body acts as if I don’t have diabetes because of the self-discipline associated with regular meditation practice, which supports a good nutrition, appropriate medication and other coping strategies. Despite this, I have had several medical procedures over the decades, addressing health issues which would likely have been more severe without my proactive lifestyle.

The processes described during the talk are based on a regular practice of mindfulness of breathing, body scanning, or lovingkindness meditation. Contemporary research also supports the benefits of other contemplative modalities such as Zen, Transcendental Meditation, hatha yoga, or tai chi.

Research into the effects of contemplative practices began after WWII, when Americans in Japan began to investigate how Zen meditation practices affect various functions such as blood pressure and general physiological arousal, using devices that became useful as “lie detectors” (The term is in quotes, as a person can be trained to not physiologically react to stressful stimulation, so the anxiety associated with lying was not registering reliably enough to be admissible in legal proceedings.). This level of technology also became known as biofeedback.

As the technology of neuroscientific research became more sophisticated in the 1990’s, Functional Magnetic Resonance Imaging (FMRI) significantly increased the sophistication of the research, along with Electroencephalography (EEG), which tracks the frequency and amplitude of electrochemical processes in the brain. FMRI tracks the flow of blood into neurological pathways that then can be associated with various mental tasks, when the test subject is inside a very large machine that tracks the blood flow very precisely and transmits the data to a computer for observation. EEG readouts use electrodes that are typically arrayed on what looks like a bathing cap; the electrodes sense the various electrical activities in the brain, but not as precisely located as is the case with the FMRI data.

These various data streams can be associated with changes in the metabolism elsewhere in the body. Additional technologically sophisticated devices can assay the contents of the blood, metabolic cellular activities and other indicators of physiological functions. This allows for a more in-depth and holistic understanding of the interactions between the brain and the rest of the body.

A major stress reaction in the body is inflammation, which involves the injection of the hormone cortisol into the bloodstream. The effect of cortisol in an emergency is beneficial, supporting adaptive behaviors. Chronic stress, however, provides an ongoing saturation of cortisol in the bloodstream which, over time, causes oxidation and inflammation of the red blood cells, and this contributes to cardiovascular disease, as well as having degenerative effects on other organ systems, including the brain, the intestines and may even contribute to some kinds of cancer.

The effects of inflammation can also be associated with the degradation of telomeres, the “caps” at the end of each DNA molecule. Every time a DNA molecule is replicated, the telomere releases the bond between the two spirals of the structure, allowing the typical splitting of the molecule for replication. Oxidation, activated either by an environmental toxin or just through aging, diminishes the integrity of the telomere, which increases the degradation of the next generation of that DNA. Current research associates this telomeric dysfunction to the aging process, including the onset of dementia and other ailments that afflict older humans.

This sort of dysfunction is also associated with various immune disorders, such as Multiple Sclerosis (MS), fibromyalgia, arthritis, and Irritable Bowel Syndrome (IBS). It is unclear whether these disorders are caused by inflammation, but they can definitely be aggravated by the condition.

Chronic pain, which may be produced by injury, is also aggravated by the emotional reactivity associated with this condition. There is also an association between obesity, diabetes and aggravated stress reactivity. Those persons afflicted by pain, obesity and diabetes also struggle with impulsive reactivity, which also negatively affects metabolic functions. People will naturally be inclined to tense up as a reaction to pain, and this causes a “ripple effect” for skeletomuscular functions. Obese people may have developed an impulsive need to eat more than is nutritionally wise, and diabetics may have problems managing to avoid what are called hyperglycemic foods, which rapidly are transformed into sugars in the body.

HOW CAN MINDFULNESS MEDITATION PRACTICE BE HELPFUL IN ADDRESSING THESE PROBLEMS?

In 1979, Jon Kabat-Zinn developed Mindfulness Based Stress Reduction (MBSR) at the University of Massachusetts teaching hospital in Worcester, Massachusetts. He has been practicing mindfulness meditation since the 1960’s, and is closely associated with Richard Davidson and Daniel Goleman, both of whom are seminal figures regarding the introduction of mindfulness meditation to the West. I first learned of Kabat-Zinn’s work in the book “Healing and the Mind”, also produced as a tv documentary, by Bill Moyers.

MBSR was created to provide the support of mindfulness and mild forms of yoga for those individuals experiencing chronic pain and the effects of chronic diseases aggravated by stress. The program lasts 8 weeks and certified MBSR instructors are found around the world currently. It is very well-researched and regarded as an “evidence-based” intervention, which means it has the support of carefully reviewed and published research. It has been shown to reduce the need for pain medication among those who have chronic pain syndrome and increase the functionality of those afflicted with otherwise disabling health problems.

Some interesting research tracked the longevity and functionality of those affected by cancer. The research is mostly associated with breast cancer and demonstrates that those recovering women who practice mindfulness meditation or are involved in support groups live significantly longer than those in control groups.

There is also research that is tentative in its conclusions regarding the effects of mindfulness meditation practices for reducing the inflammation that leads to the diminishment of telomeric functioning associated with aging, reducing the likelihood or severity of various disorders of aging such as arthritis, cognitive decline or dementia, as well as frailty.

Additional research suggests that a benefit of mindfulness meditation is the increase in effective immune responses. One research investigation involved the generation of antibodies, primary elements of immune response systems in the body. College students were invited to receive flu shots; the control group got the shots, but no other intervention, while the study group got the flu shots and also practiced mindfulness of breathing meditation. After some time, each group provided a blood sample, and it was discovered that there was a larger population of antibodies in the group who meditated than the control group. Other studies focused on the association between compassion meditation in experienced meditators and the amount of interleukin IL-6, a protein that functions to enhance immune responses.