

Psyche and soma

We know from personal experience that mind and body affect each other. Thinking about something can trigger feelings in our body, and pain and illness dampen our mental state. How does this actually happen inside us? And we may suspect that some of the illnesses we, and our clients, suffer have a psychosomatic element. But how exactly can psyche have this effect on soma? How mind and body affect each other may seem mysterious, and philosophical debates about the 'mind-body question' abound. But neuroscience has penetrated the mystery and offers a picture of the whole person – psyche and soma. Psychosomatic issues that have provided fertile ground for conjecture and speculation can now be explored more concretely.

The mind-body connection

Brain and body change each other via neural pathways (nerves) and biochemical pathways (hormones, peptides etc. in the bloodstream). The brain evaluates external sensory signals and triggers the movement of limbs and emotional changes in the body. It decides, for example, where in the body gets more blood when we're stressed. In the other direction, it needs blood and oxygen from the body, and sensory signals from within so it knows what's happening there. Mental activity generates emotional body states, and body states change the neural landscape in the brain, affecting how we feel, what we perceive and what we think about.¹ For example, a body made anxious by an anxious brain then biases the brain into further anxious thoughts.

A rule of thumb: the brain *initiates* what happens in the body (such as emotional states), and the body *influences* what happens in the brain (emotional states affecting the brain in a feedback loop) – though there are exceptions. To unravel mind-body mysteries, we must explore the details of what passes in either direction.

The neural pathways between brain and body mean that the brain reaches far into the body since it belongs to the *central nervous system* that includes the spinal cord. From there, it's only one more link via the *peripheral nervous system* to every nook and cranny of the body. The *autonomic nervous system* is the part of central and peripheral systems that we cannot consciously control – for example, nerves governing heart rate, and blood pressure. It sub-divides into *sympathetic* and *parasympathetic* branches for, respectively, arousal and energy on one hand, and rest and sleep on the other.

There are more *sensory nerves* from body to brain than *motor nerves* from brain to body. This is because the brain's signals to change something in the body are relatively straightforward, whereas the body's signals about its inner state are detailed and complex.

The biochemical pathways between body and brain also flow in both directions. A prime example of brain to body is the *HPA axis* (hypothalamus-pituitary-adrenal), a sequence of hormones that starts in the hypothalamus in the brain and ends with the release of adrenaline and cortisol from the adrenal glands. This is the biochemical half of the stress response, the other half being the sympathetic nervous system that makes the heart beat faster and raises blood pressure. From body to brain, biochemicals such as cortisol enter the bloodstream and get into the brain, tweaking the neural landscape.

The brain 'maps' the body: the five senses, the movement of muscles and limbs, the configuration of the body in space, and the state of the *viscera* and *internal milieu* (the organs and fluids sloshing around inside the body).¹ Mapping is dynamic, especially in the right hemisphere, as our internal somatic state is forever in flux. Body mapping means we have a 'neurosymbolic' body in our brain, which sometimes leads to strange phenomena such as body dysmorphia whereby our perception of our body differs from how it appears to others.²

Differences between the left and right hemispheres shed light on the mind-body connection, since the right is more inter-connected with the body than is the left. The right hemisphere changes inner things like heart rate and breathing, in the background, in response to what's happening around us. It triggers sympathetic arousal in the body, and therefore the stress response. It has a more complete map of the whole body, including viscera and internal milieu, than the left has, and is therefore dominant for interoception, the sense of our body from within³. It's where our felt sense of a situation arises.

The left hemisphere sees mind and body as separate, while the right sees them as an ensemble. Left says "I have a body", right says "I am my body".⁴ We can posit a *foreground mind* in the left and a *background bodymind* in the right, and a *right brain-body ensemble*. We project the wonders of

right's wholistic functioning into the apparently unsolved mysteries of the body, including 'the wisdom of the body' – such wisdom arises in the right hemisphere, informed by the body. And since bodymind is background, the psychosomatic aspect of illness easily eludes us.

Psychosomatic conditions

The potential for psychosomatic illness was recognised by Jung: “a wrong functioning of the psyche can do much to injure the body, just as conversely a bodily illness can affect the psyche; for psyche and body are not separate entities, but one and the same life.”⁵ His notion of psyche points to the right hemisphere, our inner world where body, feeling, and less conscious aspects of mind intertwine.

Somatisation is the tendency to have physical symptoms in response to stress or emotion, a normal feature of life in which the body expresses mental or emotional distress. Psychosomatic symptoms are physical symptoms that occur for psychological reasons.⁶ The patient complains of *symptoms* that cause real distress and disability, but the doctor cannot find any *signs* of illness. The patient is experiencing something rooted in emotional distress rather than infection or injury (or modern medicine is missing something!). To qualify as psychosomatic, this distress should be suppressed or dissociated rather than expressed.⁷ But we cannot know any of this for sure, so clear distinctions between illnesses with psychological and physiological causes may be impossible.² Maybe all illness has a psychological element, while no illness is purely psychological in origin.

The two most common psychosomatic symptoms are fatigue and pain, which cannot be objectively measured.⁶ Others are non-cardiac chest pain, pelvic or abdominal pain, painful peeing, shortness of breath, itching and rashes, blurring of vision, and hearing loss. Psychosomatic symptoms can affect any part of the body, and involve palpitations, paralysis, convulsions, or almost any sort of disability. Every bodily function can malfunction, and any biochemical can be over-produced or under-produced. Other illnesses thought to be linked to emotional suppression and poor affect regulation include asthma, heart disease, ulcerative colitis, back pain, tension headaches, and intestinal problems.^{8,9}

Unsurprisingly, childhood abuse and neglect are all associated with psychosomatic disorders.⁶ Psychosomatic illness is often triggered by a traumatic event, such as bereavement (especially if tragic or guilt-ridden), serious physical or sexual assault, or by feeling trapped in, for example, debt or marital disharmony. Early childhood trauma, including attachment trauma, can leave the right brain-body ensemble and the autonomic nervous system in a state of chronic readiness to deal with threats, including interpersonal ones – which links with polyvagal theory, especially for gut problems.¹⁰

The two main players in psychosomatic conditions are the stress response and the immune system, so let's explore these.

Stress and illness

We get sick from activating the stress response (via the sympathetic nervous system and HPA axis) too often, too long, and for purely psychological reasons.¹¹ Ongoing stress doesn't make us ill per se, but it does increase the risk of disease, “making it more likely for the roof to cave in at some point”.¹² This happens via an over-activated cardiovascular system and chronically high blood pressure (the sympathetic nervous system), and chronically high cortisol (the HPA axis) suppressing the immune system, leaving us more prone to infection and less able to fight back once infected (as happens when we're stressed and catch a cold).

The stress response accounts for some but not all psychosomatic symptoms.⁶ Under chronic stress, the sympathetic nervous system can be activated for long periods at a low level, causing high blood pressure or heart palpitations. Bodies react in sympathy to the mind's distress. Cortisol plays an important role: normally, rising levels influence the hypothalamus and pituitary gland to reduce any further release, a feedback loop that prevents an over-active bodily response to stress. The failure, under chronic stress, of this feedback loop to dampen cortisol release is implicated in psychosomatic illness.

Another scenario is the under-secretion of cortisol that can lead to chronic fatigue syndrome, fibromyalgia, and rheumatoid arthritis.¹² Low cortisol is associated with unresolved trauma and implies poor recovery from stress (for which cortisol is needed).

Too little sleep

Stress and anxiety can mean disturbed sleep, and sleep deprivation is itself a stressor, creating a vicious circle.¹² Insufficient sleep can contribute to all sorts of health problems: cardiovascular disease, stroke, congestive heart failure, and type 2 diabetes. Routinely sleeping less than six hours a night “demolishes your immune system”, increasing the risk of cancer.¹³ And too little sleep links with hormones that make you want to eat more (weight gain).

The immune system

Combine psychology, neuroscience and immunology and you get *psychoneuroimmunology*, the science of mind–body interaction via the immune system that comprises cells, including white blood cells, found all over the body and brain. There are *macrophages* which ‘eat’ bacteria, *lymphocytes* which produce antibodies that help macrophages fight infection, and *cytokines*, proteins secreted by macrophages that circulate in the bloodstream enlisting the help of other macrophages.

Psyche affects the immune system via the stress response: “the brain has a vast potential for sticking its nose into the immune system’s business”.¹² Normally, cortisol activates it and then suppresses it to avoid over–shooting into auto–immunity, but severe and sustained stress can lead to the HPA axis releasing too much cortisol for too long, thereby suppressing the immune system below baseline, increasing the risk of immune–related illnesses. The opposite can happen too: chronic emotional stress, from bereavement or social isolation for example, can lead to an over–active immune system. Excess cytokines and macrophages can inflame the arteries, triggering heart attacks and strokes.¹⁴

In the reverse direction, soma can affect psyche via the immune system. Cytokines fight infection in the body by triggering fever, but they can also cross the *blood–brain barrier* to ‘inflamm’ the mind, causing depressive symptoms including excessive or chronic fatigue.¹⁴ Furthermore, changes to immune cells following trauma can make the immune system over–sensitive to social stress and threats so it kicks off unnecessarily with disproportionate inflammatory responses, triggering depressive symptoms.

Autoimmune disorders

The immune system can cause illness as well as protect against it – autoimmune disorders, such as allergies, rheumatoid arthritis, ulcerative colitis, and MS.¹⁵ Lymphocytes can mistake the body’s own proteins for alien proteins and mount an immune response. Macrophages churn out cytokines that cause inflammation, and this can go on for years. Psychoneuroimmunology means that trauma may play a role, but this doesn’t necessarily mean that it causes autoimmune disorders.

Inflammation

The immune system generates *inflammation* in the body as more blood goes to the injured area. It becomes red and swells up painfully, lymph fluid leaking through blood vessel walls to attack alien invaders.¹⁴ Inflammation must be kept in balance by cytokines and neuropeptides: enough to fight infection, not so much that it becomes damaging. Chronic stress can mean chronic inflammation in joints, connective tissue and organs, and chronic high blood pressure causes inflammation in blood vessels. Both are fertile ground for serious illness such as heart disease and cancer to develop. The gut is naturally in a permanent state of controlled inflammation to deal with the alien invaders we eat, and chronic stress means the balance can tip over into inflammatory bowel disease.

In the other direction, inflammation in the body can lead to biochemicals crossing the blood–brain barrier to affect how we feel and what we think about – and to trigger depression.¹⁴

Psychosomatic conditions in therapy

The science demonstrates how stress and trauma can *contribute* to psychosomatic illness via the right brain–body ensemble affecting the stress response and the immune system. Whether they *cause* illness is less clear. Furthermore, clinical experience shows that emotional expression and psychological transformation don’t necessarily lead to physiological healing. A psychosomatic disorder is really a hypothesis.

When we suspect a person’s psychology might underlie their illness, we may be tempted to interpret an illness as psychologically meaningful.⁷ The left hemisphere can be categorical and dogmatic, while the right is needed for a shared understanding of the psychological aspect of an illness to unfold between therapist and client. Reflecting on the possible meaning of symptoms can be done jointly,

rather than the therapist being the expert, or looking them up in a book. They can reflect on what purpose the illness serves and where the gain lies.⁶

To avoid shaming and angry reactions, it's often better to talk to people about their stress levels than interpret illness psychologically: "you're not mad, you're suffering from stress, anxiety and trauma in ways you haven't yet realised". Therapist and client can work to identify stress and reduce it, and they can work to resolve old traumas.

Conclusion

Chronic stress and unresolved trauma can contribute to psychosomatic conditions via excessive sympathetic arousal, too much or too little cortisol release, sleep disruption, immune suppression, or an over-active immune system generating inflammation and autoimmune conditions. The troubled mind feeds into poorly regulated physiology.

Maybe 30% of GP consultations are for psychosomatic symptoms.⁶ Psychosomatic illness is not imaginary but reflects something real happening in the brain as well as the body. It's easy to be unaware how stressed we are – it may be a constant background state. We all somatise, and from the right hemisphere's perspective our stress and distress will inevitably be reflected in the way brain, mind and body function as an ensemble. There's probably a psychological element in any illness, and it's the aspect of illness that therapy is able to address.

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