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The potential role of illness expectations in the progression of medical diseases



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Abstract

To what extent can one's mind promote direct changes to the body? Can one's beliefs about the body become a physical reality, without mediating effects from behaviors? Specifically, can medical symptoms and the course of a disease be directly affected by a person's mindset about the illness?

There is a vast literature about placebo and nocebo effects, that promote physical changes by creating the expectation of a change through a primer (for example, a fake pill). Placebos, however, often imply deception, or at least ambiguity, to be effective. The concept of Illness Expectation describes the expectations, both implicit and explicit, that a person who has received a diagnosis makes about the course of the disease. It can be characterized by different degrees of rigidity, and it is argued here that these expectations can ultimately lead to changes in the disease progression. These changes may happen through behavior modifications, or through a non-behavioral pathway, which may deserve exploration efforts from the scientific literature.

Keywords: Illness expectation, Chronic disease, Mind-body connection, Health Psychology, Placebo, Nocebo

Mind, body, and placebo

The relationship between mind and body has a long history in both medicine and psychology. Beginning with Descartes, the mind/body concepts were based on a strict dualism. More recent investigations, however, demonstrate a strong interaction between mind and body, effectively collapsing the dualistic construct [1]. Among the most studied effect that the mind exerts on the body is the placebo/nocebo effect, in which physiological changes emerge following the assumption of inert or non-specific treatment components [2]. As there is no active therapeutic component in placebos, their effects are generally attributed to the patient's beliefs of efficacy of the treatment. Placebo effects, or placebo response, refer to the desirable effects, either subjective (psychological) or objective (physiological), while nocebo effects refer to the anticipated negative effects promoted by a treatment (e.g., side effects). Given their clinical relevance, there has been a growing interest in studying the placebo and nocebo mechanisms, though there are still several open questions [3]. For example, deception

(e.g., not informing the patient that the pill is inert) or, more commonly, ambiguity (e.g., patients are told that it is uncertain what treatment they are receiving) can be a source of ethical challenges. Of course, the placebo response is not always obtained through a lack of, or limited information (see, for example, the emerging open-label placebo model [4, 5]). Moreover, both placebo and nocebo responses are not restricted to inert or "fake" interventions, but they can modulate the effects of drugs and other therapies [6]. The placebo effect depends on several aspects [7], including psychological processes (e.g., implicit learning and previous experiences), social and contextual factors (e.g., the patient-provider relationship, treatment characteristics), and biological mechanisms (body's healing properties and neurophysiological processes). The beliefs about the intervention are also influenced by psychological traits, such as optimism [8] and spirituality [9], even though situational variables seem to play a bigger role for the placebo effects than individual characteristics [10].

Effects of expectations on the body

One of the main operational mechanisms of placebos is represented by cognitive expectations, which in turn are expected to promote the occurrence of physiological

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changes in the body [11]. In general, placebo and nocebo effects have been studied with a primer, such as a sugar pill, that influences or conditions the person to anticipate an effect. The expectation of a medical effect promotes both subjective and objective (physiologic) changes, with clinical improvements or worsening [12]. However, expectations are not only prompted by drugs or interventions. In fact, every individual with a medical condition develops a certain mindset toward the illness [13], with expectations that spontaneously emerge. These expectations, which represent the result of the elaboration process of the information collected about the disease [14], can promote different physiological effects [15]. For example, blood glucose levels in people with type II diabetes are influenced by perceived time and expected values, rather than being a mere physiological process [16]. Furthermore, expectations can influence the ageing process: older adults who think about ageing as associated with negative characteristics tend to experience a greater loss of physical function and a reduced survival, compared to those who held positive expectations [17].

Illness perceptions and health beliefs

Expectations about the disease are a central component of illness perceptions and health beliefs, which are well-established concepts in health psychology [18]. Illness Perception is often explored within the theoretical framework of the Common Sense Model (CSM) of Illness Representation [19]. In the CSM theory, patient's illness perceptions include beliefs about what precipitated the illness (causes), how long it will last (timeline), the impact on the patient's life (consequences), which symptoms are attributed to the illness (identity), and how the condition can be controlled or cured by the patient's behavior (personal control) or by the treatment (treatment control). In the CSM, expectations are considered as an underlying component of the different beliefs [20, 21]. Emotional components are another key aspect of the CSM, which may interfere with cognitive processing, and it could be a source of confusion during the assessment process. For example, one of the most utilized instruments for the assessment of illness perception, the Brief Illness Perception Questionnaire [22] includes items like "How much does your illness affect you emotionally?", which are somehow related to the expectations, but refer directly to the emotional domain. The same concern deals with questions about consequences in everyday life (e.g., "My illness has serious economic and financial consequences", from the Illness Perception Questionnaire Revised [23]).

Thus far, most published research referencing the Illness Perception construct focuses on the role of disease representations in explaining both coping and outcomes

in patients with a wide range of health conditions [24, 25]. Specifically, health psychologists have explored how disease representations can lead to lifestyle modifications, eventually leading to changes in the medical outcomes [26]. For example, adherence to the medical treatment, or lifestyle choices like eating, exercising, or smoking, can be influenced by illness representations. A person who perceives that nothing can change the course of the disease, for example, may be more prone to avoid exercising or taking prescribed medicine [27]. In other words, the effects of Illness Perceptions on the body (namely, on the course of the disease or its symptoms) have been mainly explored as mediated by behavior changes [28]. The main difference between the construct of Illness Perception and Illness Expectation is their specificity: while the former is a multifaceted concept that includes several aspects of the illness experience, the latter is a specific element, the anticipation of the future illness-related scenarios, which is merely cognitive.

Emotions and somatic changes

While the influence of psychological factors on the body has been explored with the mediating effect of behavior changes, there is also a vast literature that has investigated the relationship between negative affects, such as stress and depression, and medical outcome. Fields such as psychoneuroendocrinology and psychoneuroimmunology have been explicitly created to investigate these relationships. Briefly, we know that negative emotions (e.g., depression, stress) have, among other effects, a strong impact on human physiology [29], often reflecting on poorer medical outcomes, in the case of chronic diseases. For example, depressive states and stress have been associated with reduced survival rate in patients with cancer [30]. The mechanisms underlying these associations are still under investigation.

Illness expectations

Despite the vast placebo/nocebo literature, expectations are not typically manipulated directly and are often discussed in unison with an inert agent. Expectations seem to have a role in illness beyond the delivery of (fake) treatments. This situation leaves some ambiguity when the findings on placebo effects apply and when they do not. For this reason, it could be relevant to isolate a specific model, that specifically refers to the expectations that a person has toward his/her illness. I suggest to define this construct "Illness Expectation" (IE). IE is the cognitive schema that defines the expected characteristics of the disease progression and future-oriented beliefs about the symptoms. Like other expectations [20], IEs can manifest as explicit (conscious) future-directed cognitions, or they may be implicit, without an individual's

full awareness. There could be a certain level of overlap between conscious and unconscious processes [31], but though they do not necessarily converge. For example, a person can be well-informed about the expected trajectory of his/her disease, but it is also possible that, implicitly, (s)he represents future developments of the symptoms in a different way. The expectations are based on the supposed knowledge about the diagnosis and the illness [32]. They are therefore influenced by the information received, as well as by the cognitive and emotional elaboration processes, which rely on personal history and skills. Verbal information, patient-clinician interactions, and prior experiences or previous conditioning, as well as personality and other psychological factors (e.g., optimism) may influence the expectation creation, similar to how they influence the placebo response [33, 34]. Illness Expectations could be seen as a specific form of response expectancy, defined by Kirsch [35] as the anticipation of non-volitional responses.

As with other psychological constructs, IEs reflect individual differences, that is, people with the same diagnosis and who have received similar information may have different expectations. The same psychological traits that influence the development of the treatment expectations, which may modulate the placebo response, may be involved in the characterization of Illness Expectations. For example, it is possible that optimism and spirituality have a positive impact, which would be in line with the positive associations found with these two variables and health [36]. At the same time, social and contextual aspects, such as the patient-physician relationship and trust, social support, could play a role in modulating the expectations. Future studies are required to understand the possible role of these variables.

A crucial factor that mediates the effects of IE is cognitive rigidity. As a cognitive schema, expectations may additionally incorporate different degrees of rigidity, ranging from a mild expectation to a very strict conception of what “will” happen in terms of disease progression. The concept of rigidity, in this context, refers to an inability to maintain a dynamic view of one’s status, effectively keeping evaluations static over time [37]. In other words, rigid IEs tend to be very emphatic and resistant mental sets, which could be similar to certain core beliefs in the cognitive-behavioral approach [38]. It is effectively a form of mindlessness, in which an idea is unchanged over time even with changes in situation or context [39, 40]. Cognitive rigidity, which is the reverse of cognitive flexibility, is generally considered a stable characteristic over time [41]. Similar to flexibility, however, rigidity could change over time, for example as a result of a psychological intervention [42].

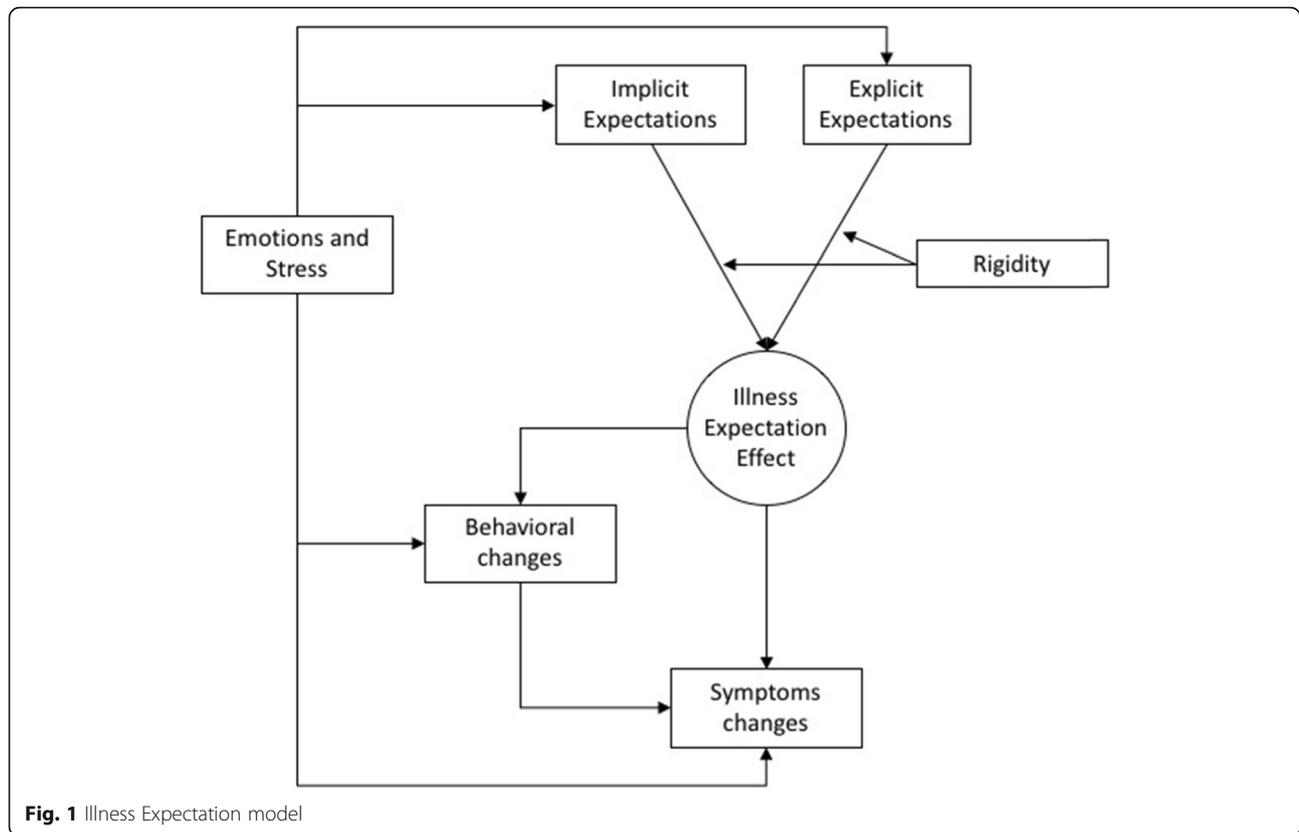
Under the lens of the Illness Expectation model, the placebo response is not necessarily the arising of new,

treatment-related expectations, but it could represent the modification of a previously existing mindset. However, the IE effects are not limited to placebo responses. Placebos are an external manipulation, often achieved with some form of ambiguity or deception (e.g., a “fake” pill), while IEs are self-created, although they can be influenced by external manipulations (e.g., doctor’s opinions, information from other patients).

It is here suggested that IE could influence symptoms and disease progressions (i.e., medical outcomes) with two ways: a behavioral way and a non-behavioral way (Fig. 1). The former refers to behavioral changes, including adherence to the treatment and lifestyle (physical activity, eating habits...) modifications. The non-behavioral way refers to the physiological changes “directly” influenced by the expectations, mirroring the placebo/nocebo effect, but observed without a primer.

While expectations and rigidity focus emphasize the cognitive level of the mind/body interaction, emotions and stress can also interact with the process, with different pathways. Emotions (e.g., fear) could influence both implicit and explicit expectations. They could lead to behavioral changes, and direct effects of negative emotions on the body (e.g., immune system) are documented [29]. A peculiarity of this model is the role of rigidity, which could represent a clinical target for psychological interventions. There are several psychological approaches that could improve flexibility and discourage rigid thinking. Future studies could explore how these interventions could modify the IE effects on the body.

The IE model, at the present, is based on indirect evidence from the scientific literature and organized through this theory. Empirical studies are warranted to test its validity and provide direct data-driven conclusions. One of the first problems that should be addressed by this field is the development of tools for the expectation assessment. While there are existing instruments that assess expectations, most of them focus on treatment expectations. For example, The Credibility/Expectancy Questionnaire [43] explores treatment credibility and expectancy, while the Stanford Expectations of Treatment Scale [44] considers both positive and negative expectations. Although very important, treatment expectancies do not include the illness expectations as a whole. Furthermore, considering the potential role of both implicit and explicit components, self-reported measures may not be able to fully assess the construct. The use of instruments to assess implicit components should be considered. Studying the effects of IE manipulations on the body may provide important confirms/disconfirms to the mind/body connection hypothesis, with the potential to lead to several clinical implications. Perhaps the most important and ambitious one would be a better understanding of how we can use a mechanism



similar to the placebo effect, without the ethical burden of deception. The meaningful use of the placebo effect without deception has been suggested as a highly relevant research topic in psychology [3]. It could push to the limits our current understanding of the mind/body connection, with yet to be explored opportunities for clinical interventions.

Abbreviations

CSM: Common Sense Model; IE: Illness Expectation

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