

# Relationship between stress and physical illness



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Outline and evaluate research investigating the link between stress and physical illness.

The presence of stress has been identified as an important attribute to psychological well-being. However, through a considerable quantity of research, Psychologists have suggested that psychological encounters are capable of altering various aspects of the immune response. Supporting this, Frese (1985) suggested that stress is frequently involved in 50-70% of all physical illness (McIlveen, Gross, 1996, p. 171). Therefore, it will be deliberated that Seyle's research led to the development of psychoimmunology; which is an area of study investigating the relationship between psychological factors and the immune system of the body. (Hayes, 2000, p. 404) This essay will analyse and combine empirical knowledge referring to psychological stress and the human immune system while emphasising relevant psychological research and composing evaluative conclusions from the information provided.

To begin with, one must be required to consider what is meant by the term "stress" and the significance this component has on an individual. As stated by Lazarus and Folkman (1984), the definition of stress is "a pattern of negative physiological states and psychological responses occurring in situations where people perceive threats to their well-being which they may be unable to meet." (McIlveen, Gross, 1996, p. 169) Subsequently, Lazarus and Folkman's definition of stress is largely accepted by those active in the area of research in this field, thus admitting further research by psychologists to establish the psychological effects of stress. While

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considering this, the consequences of stress induced on the body must be investigated. The immune system is a mechanism designed to protect and defend the body against antigens such as viruses, bacteria, toxins, and parasites. (Cardwell, Flanagan, 2012, p. 136) To guarantee maximum performance, this intricate system is attained through the release of two types of lymphocytes; B cells and T cells. (Cardwell, Flanagan, 2012, p. 136) Therefore, the purpose of the B cell is to produce antibodies which will destroy invading viruses, and the T cell assists the B cell in making antibodies, therefore, destroying invading cells which have initially survived an attack from the B cell. (Science Museum, 2014) As a result, when an individual is stressed it will leave them more susceptible to infection because the immune system is unable to eliminate antigens.

Seyle (1956), who was predominantly interested in the body's resistance to prolonged exposure in stressful situations, either through physical illness or psychological causes, identified the response to long-term stress through humans and animals. To do this he used a model known as the ' General Adaptation Syndrome'. (Hayes, 2000, p. 403) As a result of this, Seyle categorised three key stages of bodily reaction during stressful occurrences. The initial stage is the " alarm" stage which stimulates the body to release adrenaline, which is then followed by a state of " resistance", where the body's resources are used quicker than they are restored. Consequently, as the individual enters the final stage of " exhaustion" or also known as the " burnout" stage, the probability of developing a stress related illness significantly increases. (McIlveen, Gross, 1996, p. 170) Although Seyle's findings were based upon stressors, internal and external sources of stress,

(Lawton, Gross, Rolls, 2011, p. 1115) produced in non-human animals, therefore making the results non-applicable to human beings, they were still exceedingly recognised to offer a useful approach for other psychologists in their research into the interpretation of the physiological responses to a stressor.

Alternatively, Merson (2001) states that the three stages which the body reacts to, is a result of the presence of a stressor. Additionally, Merson suggested that the performance of the immune system remains at a regular level throughout the onset of stress. (Bartley, 2013, p. 27) Consequently, if the stressor continues, then the immune system's ability to perform reaches its maximum point. However, performance is at its lowest point if the stressor becomes chronic. In support of Merson's theory, several psychological studies have emphasised the observation that short-term stress does not always decrease the functioning of the immune system, but can in fact sometimes enhance it. One of these studies, performed by Dhabhar and McEwen (1997, 2001), ascertained that the immune system is roused as a result of the "fight or flight" response. (ncbi, 2006) A term signifying an individual's psychological innate energised response to an intimidating situation, to either fight or run away, basically meaning an overall state of readiness. In an experiment exposing mice to mild stress over a two hour period, Dhabhar also revealed, that large distribution of immune cells was composed by three hormones released by the adrenal gland. These hormones were norepinephrine, epinephrine and cortocosterone. (Wood, 2012) Following this, he discovered a pattern of choreographed changes in blood levels within these three hormones,

exemplifying how the immune cells from areas such as spleen and bone marrow were compelled to move to “ front line” organs. Therefore suggesting that, short-term stressors can in fact boost the performance of the immune system. However, the psychological responses of a non-human animal cannot be used to explain human performance.

Additionally, Evans *et al.* (1994) studied the activity of an antibody known as sIgA, which helps prevent infection. (Cardwell, Flanagan, 2012, p. 137) Evans *et al.* organised a talk to be given to students by other students, resulting in mild but acute stress. Although these students showed signs of an increase in sIgA, they reduced during examination periods extending over several weeks Furthermore, Malarkey *et al.* (1994) proposed that marital arguments lead to weaker immune system functioning, following the study of 90 newly-wed couples. As a result, it was suggested that stress has two effects on the immune system; acute stress enhances it, whereas chronic stress reduces it.

However, Kiecolt-Glaser *et al.* (1984) carried out a natural experiment to examine the effects of long-term stressors and find out if there was a difference in the immune response of individuals in low and high stress conditions. It was predicted that immunosuppression, measured by the quantity of natural killer cell or T cell activity, would reduce when stress levels were increased. (Lawton, Gross, Rolls, 2011, p. 120) Therefore, blood samples were taken from 75 volunteer first-year medical students, 26 females and 49 males, one month before their final exams and again on the first day of their exams, following two examinations. (Lawton, Gross, Rolls, 2011, p. 120) These were presumed to be periods of low and high stress. The students were also provided with questionnaires, such as the Social

Readjustment Rating Scale [SRRS] (docstoc, 2010) to assess any psychological symptoms which may have been present. As predicted, the findings emphasised that the blood samples taken after the examinations, contained a declined number of T cells and the immune response was suppressed in participants who suffered from psychological variables. Consequently, Kiecolt-Glaser *et al*/ concluded that the examination stress alone did in fact weaken the functioning of the immune system as the participants had a reduced amount of natural killer cells. It had also become apparent that life events, depression, loneliness, and anxiety were all results of a weakened immune response and therefore can be contributed from stress.

As a result, it is important to highlight that although Kiecolt-Glaser's study is a natural experiment, and thus high in ecological validity, which is a term that refers to whether or not a study can generalise from reserved conduct in a laboratory to natural behaviour in the real world, (Hartas, 2010, p. 77) it also lacks control over confounding variables, such as caffeine, nicotine, medication and so on as it's carried out in natural surroundings. As a result, it cannot be guaranteed that stress led to the immune response as elements that were not controlled could be accountable.