Laughter Effects

Jacqui Fahey | Educator

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It is common knowledge that the mind influences the body and vice versa. *An ancient medical principle, "**vis medicatrix naturae**"* includes reference to the innate ability of the body to heal itself.

Recent decades have witnessed the growing links in research between neuroscience and the immune system.

Psychoneuroimmunology (PNI) is an expanding field of research that suggests in addition to its established psychological benefits, humour including laughter may have physiological effects on immune functioning. According to PNI theory and some humour studies, humour may influence health through moderation of stress chemicals and/or immune-enhancement ([1]-[9]).

Laughter is a highly complex process. Joyous or mirthful laughter is considered a positive stress (eustress) that involves complicated brain activities leading to a positive effect on health. Norman Cousins was a pioneer in the idea that beliefs, thoughts and emotions have biological effects ("biotranslation"). In his ground-breaking work ([10]), Cousins documented his use of laughter in treating himself for autoimmune disease, with medical approval and oversight, into remission ([11]).

Though studies have been small, researchers have found humour and laughter may improve our health in some of the following ways;

- Recent research observed a 43% decline in moderate pain intensity after a six-week humour therapy program in elderly people with chronic pain. The program consisted of 6, weekly, one-hour group sessions which included humorous video clips, games, comical stories, humorous music and jokes. It was concluded that humour therapy can have an impact on pain intensity and, thus, be employed in social groups of elderly individuals such as those in nursing homes ([12]).
- A 2018 randomized controlled trial found cortisol levels significantly decreased in laughter yoga (LY) and comedy movie groups. Dehydroepiandrosterone (DHEA) levels were not

affected.

120 healthy university students experienced LY which involved watching a comedy movie (spontaneous laughter), or reading a book. Effect of spontaneous laughter on cortisol lasted longer than that of simulated laughter ([13]).

- A study exploring the modulation of neuro-immune parameters during mirthful laughter found increases in natural killer cell activity, increase in immunoglobulins G and M (IgG and IgM) with several of these effects lasting 12 hours into recovery from initiation of the humour intervention ([6]).
- Researchers examined the effects of laughter on neuroendocrine hormones involved in classical stress responses. It was found that mirthful laughter reduced serum levels of cortisol, dopac , epinephrine, and growth hormone. The authors concluded that since increased cortisol and epinephrine levels during stress are immunosuppressive, decreasing their levels may diminish the suppression of the respective immune components and laughter may play a role in immune-modulation ([4]).
- Researchers found that even the anticipation of a laughter event reduced the stress hormones cortisol, epinephrine and dopac for their experiment group. Epinephrine (also known as adrenaline) and dopac were reduced by 39%, 70% and 38% respectively (statistically significant compared to the control group) ([11], [14]).

There are numerous challenges in researching humour and laughter, particularly when the focus of study is spontaneous humour in health-care interactions. Humour is multi-faceted, with social, cognitive, perceptual and emotional aspects.

What it is determines, to some extent, *if or how* it is recognized, understood and reciprocated (or not) ([15]). Humour might be complex, but, according to patients, *it is an activity worth engaging in*, with one study exploring patients' perspectives on the use of humour in health care ([15]).

Humour and laughter is a resource that is easily available and can be a low-cost strategy to reduce stress.

Researchers conclude that more studies are needed, however with a growing body of biological evidence, there is increasing support that laughter plays an important factor in understanding humanity and in contributing to human well-being ([16]).

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