

Laughter, A Great Medicine – Presenting The Evidence



Dr Michael Abrahams

Laughter, A Great Medicine

Laughter

- ▶ A physical reaction in humans and some other species of primate, consisting typically of rhythmical, often audible contractions of the diaphragm and other parts of the respiratory system

Laughter, A Great Medicine

Gelotology

- ▶ The study of humour and laughter, and its psychological and physiological effects on the human body

Laughter, A Great Medicine

- ▶ “Laughter is the best medicine”
- ▶ Proverbs 17:22 “A joyful heart is good medicine, but a broken spirit dries up the bones”

Laughter, A Great Medicine

Usually Associated With Positive Emotional States

- ▶ Happiness
- ▶ Joy
- ▶ Relief
- ▶ Excitement

Laughter, A Great Medicine



Sometimes Contrary Emotional States

- ▶ Embarrassment
- ▶ Confusion
- ▶ Nervousness

Laughter, A Great Medicine

History Of Laughter Therapy

- ▶ Surgeons used humour to distract patients from pain as early as the 13th century
- ▶ 20th century, scientific study of the effect of humour on physical wellness

Laughter, A Great Medicine

History Of Laughter Therapy

- ▶ Dr James Walsh (Laughter and Health, 1928)
- ▶ Laughter appears to reduce post-operative pain

Laughter, A Great Medicine

History Of Laughter Therapy

- ▶ Norman Cousins (Anatomy of an Illness, 1979)
- ▶ Used regimen of laughter and vitamins to treat ankylosing spondylitis
- ▶ With consent of doctors, checked himself out of the hospital and into a hotel
- ▶ Invited friends over and watched a lot of comedy films and laughed a lot
- ▶ 10 minutes of laughter gave 2 hours of pain-free sleep

Laughter, A Great Medicine

Reported Physical Benefits Of Laughter

- ▶ Boost the immune and circulatory systems
- ▶ Enhance oxygen intake
- ▶ Stimulate the heart and lungs
- ▶ Relax muscles throughout the body
- ▶ Trigger the release of endorphins (the body's natural painkillers)
- ▶ Ease digestion
- ▶ Relieve pain
- ▶ Balance blood pressure
- ▶ Improve mental functions (i.e., alertness, memory, creativity)

Laughter, A Great Medicine

▶ The Effects Of Laughter On Stress

- ▶ Hans Selye
- ▶ Has balancing mechanism that encourages two-step action of stimulation and relaxation
- ▶ Release of chemicals adrenaline and noradrenaline
- ▶ This produces a feeling of wellbeing by relieving minor stresses and strains
- ▶ Laughter also reduces anxiety, tension and depression
- ▶ Mitigates serious diseases such as hypertension, heart disease, diabetes, in which anxiety and tension are predisposing factors

Laughter, A Great Medicine

The Effects Of Laughter On Stress

- ▶ Dr Lee Berk (Loma Linda University, 2006)
- ▶ Anticipation of 'mirthful laughter' (watching a humorous video), boosts health-protecting hormones
- ▶ Beta-endorphins (alleviate depression), increased by 27%
- ▶ Human growth hormone (helps with immunity), increased by 87%
- ▶ No increases in control group

Laughter, A Great Medicine

The Effects Of Laughter On Stress

- ▶ Dr Lee Berk (Loma Linda University, 2008)
- ▶ Anticipation of 'mirthful laughter' (watching a humorous video), decreases levels of stress hormones
- ▶ Cortisol decreased by 39%
- ▶ Epinephrine (adrenaline) decreased by 70%
- ▶ Dopac (dopamine metabolite) decreased by 38%
- ▶ Chronically high stress hormone levels can weaken the immune system
- ▶ Psychoneuroimmunology

Laughter, A Great Medicine

Laughter As An Analgesic

- ▶ Laughter releases neuropeptides like endorphins and enkephalins which are natural opiates and pain suppressing agents
- ▶ The ability of laughter to release muscle tension and soothe the sympathetic nervous system also helps to control pain, as does increased circulation.
- ▶ Laughter has a multi-pronged approach for the relief of pain in conditions such as arthritis, spondylitis, etc.

Laughter, A Great Medicine

- ▶ **Laughter As An Analgesic**
- ▶ In a 1996 study that investigated pain relief, surgery patients were found to require lower doses of analgesics when they watched funny films than when they watched serious movies
- ▶ When they viewed "annoying comedies," their use of analgesics increased

Laughter, A Great Medicine

Laughter As An Analgesic

- ▶ Cogan et al (Journal of Behavioral Medicine, 1987)
- ▶ Discomfort thresholds higher in subjects after bouts of laughter

Laughter, A Great Medicine

Laughter And Immunity

- ▶ With respect to cellular immunity, watching a one-hour comedy video has been found to produce:
 - ▶ Increased number of B cells
 - ▶ Increased number of, and activation of T cells
 - ▶ Increased number of Helper T cells (the cells attacked by the AIDS virus)
 - ▶ Increased ratio of helper/suppressor T cells
 - ▶ Increased number of, and activity of, natural killer (NK) cells
 - ▶ Increased levels of gamma interferon

Laughter, A Great Medicine

Laughter And Immunity

- ▶ Lee S. Berk (Clinical Research 1989)
Laughter may attenuate some stress-related hormones and modify natural killer cell activity, resulting in immunomodulation
- ▶ Labott (Journal of Behavioral Medicine, 1990)
Laughter results in improved immunity
- ▶ Canada's University of Waterloo (Well Being Journal)
Laughter increases the levels of immunoglobulin IgA and IgG
- ▶ Norman Cousins (Prevention March 1988)
Laughter serves as a blocking agent against disease

Laughter, A Great Medicine

Laughter And Immunity

- ▶ Laughter, by improving body immunity, can mitigate a host of chronic diseases such as bronchitis, common cold, rheumatoid arthritis, allergies, etc.
- ▶ Improving immunity may also be a supplementary measure in the control of AIDS

Laughter, A Great Medicine

Cancer And Laughter

- ▶ Berk and Tan (1996)
- ▶ Examined laughter-immunity connection
- ▶ Healthy fasting males viewed funny video film for an hour
- ▶ Blood samples taken of interferon-gamma (IFN) before, during and after watching the film
- ▶ Increased activity in IFN, after watching the funny video, lasting until the following day
- ▶ IFN activates the CT-Cells, B-Cells immunoglobulins and natural killer (NK) cells

Laughter, A Great Medicine

- ▶ **Cancer And Laughter**
- ▶ Laughter also fights against tumour cells
- ▶ In laughter clubs, many cancer patients lead much healthier lives due to positive attitude towards life
- ▶ Laughter can possibly be used as a preventive measure against cancer

Laughter, A Great Medicine

- ▶ **Laughter As An Aerobic Exercise**

- ▶ Dr W. Fry

- 100 laughs a day equal to 10 minutes of rowing or jogging

- ▶ Maciej Buchowski (Vanderbilt University)

- 10-15 minutes of laughter burned 50 calories

- ▶ Lloyd (Journal of General Psychology, 1938)

- Laughter is combination of deep inhalation and full exhalation, inspiring “excellent ventilation, wonderful rest and profound release”

- Laughter increases the lungs' vital capacity and oxygenation

Laughter, A Great Medicine

Effect Of Laughter On Cardiovascular System

- ▶ Dr Michael Miller (University Of Maryland School Of Medicine)
- ▶ Laughter appears to cause the tissue that forms the inner lining of blood vessels, the endothelium, to dilate or expand, in order to increase blood flow
- ▶ Emotionally-wrenching movies that produced mental stress, on the other hand, caused vasoconstriction – tightening of the blood vessels, which reduces blood flow
- ▶ Findings suggest that laughter may do the cardiovascular system some good while mental stress will slow down blood flow
- ▶ Thirty minutes of exercise three times a week, and 15 minutes of laughter daily probably good for the vascular system

Laughter, A Great Medicine

Effect Of Laughter On Diabetes And Cholesterol

- ▶ Lee Berk, DrPH, MPH (Psychoneuroimmunologist at Loma Linda University) and Stanley Tan, MD, PhD (Endocrinologist and diabetes specialist at Oak Crest Health Research Institute)
- ▶ Examined effect of “mirthful laughter” on individuals with diabetes
- ▶ Laughter, as a preventive adjunct therapy in diabetes care, raised good cholesterol and lowered inflammation

Laughter, A Great Medicine

Effect Of Laughter On Diabetes And Cholesterol

- ▶ 20 high-risk diabetic patients with hypertension and hyperlipidaemia divided into two groups: Group C (control) and Group L (laughter)
- ▶ Both groups started on standard medications for diabetes, hypertension (ACE inhibitor or ARB) and hyperlipidaemia (statins)
- ▶ Both groups followed for 12 months, testing blood for stress hormones epinephrine and norepinephrine; HDL cholesterol; inflammatory cytokines $\text{TNF-}\alpha$ $\text{IFN-}\gamma$ and IL-6, which contribute to the acceleration of atherosclerosis and C-reactive proteins (hs-CRP), a marker of inflammation and cardiovascular disease
- ▶ Group L viewed self-selected humour for 30 minutes in addition to the standard therapies described above

Laughter, A Great Medicine

Effect Of Laughter On Diabetes And Cholesterol

- ▶ Patients in laughter group (Group L) had lower epinephrine and norepinephrine levels by second month, suggesting lower stress levels
- ▶ Increased HDL (good) cholesterol
- ▶ Lower levels of TNF- α , IFN- γ , IL-6 and hs-CRP levels, indicating lower levels of inflammation
- ▶ At end of one year, significant improvement in Group L
- ▶ HDL cholesterol rose by 26 percent in Group L (laughter), and 3 percent in the Group C (control)
- ▶ Harmful C-reactive proteins decreased 66 percent in laughter group vs. 26 percent for the control group

Laughter, A Great Medicine

Effect Of Laughter On Diabetes And Cholesterol

- ▶ Study suggests that the addition of an adjunct therapeutic mirthful laughter Rx (a potential modulator of positive mood state) to standard diabetes care may lower stress and inflammatory response and increase “good” cholesterol levels
- ▶ Mirthful laughter may lower risk of cardiovascular disease associated with diabetes mellitus and metabolic syndrome

Laughter, A Great Medicine

Laughter And Gene Regulation

- ▶ Kazuo Murakami (Foundation for Advancement of International Science, Bio-Laboratory in Japan)
- ▶ Laughter has the ability to regulate genes and arouse latent genetic expression in type 2 diabetes
- ▶ Has tremendous effect on gene expression in the DNA formation
- ▶ Laughter used to trigger energy inside a person's DNA, potentially helping to cure a disease
- ▶ Diabetics laughed at a comedy show performed by top stand-up comedians after listening to a monotonous college lecture
- ▶ Blood glucose levels dropped significantly after laughing as compared with levels after listening to boring lecture
- ▶ 23 genes activated with laughter
- ▶ 18 of these genes control immune response and cell signal transmission

Laughter, A Great Medicine

Effects Of laughter On infertility

- ▶ Dr Shevach Friedler (Fertility and Sterility)
- ▶ 219 women undergoing IVF
- ▶ Odds of success greater among women entertained by a professional "medical clown" for fifteen minutes immediately after embryos implanted
- ▶ 36 percent became pregnant, versus 20 percent of women who had comedy-free recovery after embryo implantation
- ▶ Women who laughed were more than twice as likely to become pregnant, when other factors -- like age, type of infertility and the number of embryos implanted -- were taken into account

Laughter, A Great Medicine

Effects Of Laughter On Memory

- ▶ Loma Linda University
- ▶ 20 healthy older adults in 60s and 70s
- ▶ Measured stress levels and short-term memory
- ▶ One group sat silently, not talking, reading, or using cell phones
- ▶ Other group watched funny videos
- ▶ After 20 minutes, participants gave saliva samples and took short memory test

Laughter, A Great Medicine

Effects Of Laughter On Memory

- ▶ Participants who viewed funny videos had much higher improvement in recall abilities, 43.6 percent, compared with 20.3 percent in the non-humour group
- ▶ Humour group showed considerably lower levels of cortisol, the "stress hormone," after watching the videos
- ▶ Non-humour group's stress levels decreased just slightly

Laughter, A Great Medicine

Effects Of Laughter On The Elderly

Ghodbin (Int. J. Community Based Midwifery, 2015)

Statistically significant correlation between laughter and:

- ▶ General health ($P=0.001$)
- ▶ Somatic symptoms ($P=0.001$)
- ▶ Insomnia ($P=0.001$)
- ▶ Anxiety ($P=0.001$)
- ▶ No statistically significant correlation among laughter therapy, social dysfunction ($P=0.28$) and depression ($P=0.069$).

Laughter, A Great Medicine

Effects On Laughter On The Elderly

- ▶ Ko HJ (YouGeriatr Gerontol Int., 2011)
- ▶ Laughter therapy considered to be useful, cost-effective and easily-accessible intervention that has positive effects on depression, insomnia, and sleep quality in the elderly

Laughter, A Great Medicine

Points To Consider

- ▶ Most studies of laughter small
- ▶ Studies of laughing have often not looked at the effects of other similar activities, like screaming, or other forms of distraction
- ▶ We are thirty times more likely to laugh when we are with other people than when we are alone
- ▶ People who laugh a lot may just have a strong connection to the people around them
- ▶ Cultural and racial factors must be taken into consideration when conducting studies

Laughter, A Great Medicine

Conclusions

- ▶ Sufficient evidence exists to suggest that laughter has some positive, quantifiable effects on certain aspects of health
- ▶ It would be appropriate for laughter to be used as a complementary/alternative medicine in the prevention and treatment of illnesses
- ▶ Larger studies are needed

THE END

