HEALING EFFECTS OF LAUGHTER TO IMMUNE SYSTEM FUNCTIONING:
A CASE STUDY

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of the Requirement for the Degree
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ABSTRACT

The healing effects of laughter have been highly underrated in this researcher’s opinion. The power of a smile or the mere sound of laughter can benefit the soul and the spirit in many ways. Laughter may be perceived as frivolous to some or as a silly way of displaying enjoyment. However, it is this researcher’s belief that laughter can be compared to a euphoric high and the feeling can be extremely addicting.

The purpose of the study was to examine the effects of laughter to the immune system and spirit of an individual; the research also includes a case study from a cancer survivor who incorporated humor in her life during her life threatening illness. The evolution of laughter, benefits to the immune system, limbic system functioning and physical health during laughter were examined as evidence to support this researcher’s belief in the healing power of mirth.

The study provides powerful evidence to support the theory of laughter truly being the best medicine and how a patient’s disposition can be affected during extremely distressful situations. It is this researcher’s belief that the effects of laughter to the body can be invaluable only if a person chooses to adopt a humorous outlook in life. It is this researcher’s belief that not only is laughter a powerful feeling of elation, but a gift to the spirit that causes the heart to dance.
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CHAPTER 1

THE PROBLEM

Introduction

For this researcher, laughter is truly medicine for the soul and body; a life without the benefit of laughter would be extremely difficult, even imaginable. Using a case study approach, the therapeutic and healing benefits of laughter were examined in the life of a cancer patient, as well as the overall benefits of laughter to the mind, body and spirit.

Development of the Problem

"We have pretty good idea about the impact that laughter and humor can have on a person's mental well-being," said Dr. Lonnie Zeltzer, who serves as associate director of the Patients and Survivors section in the Division of Cancer Prevention and Control Research at UCLA's Johnson Cancer Center. "But no one has really looked with any depth at the possible biologic links between health, having a good sense of humor and even the act of laughter itself. We will study the impact that both humor and laughter have on the immune system and pain transmission and control. It's already been suggested that if you make people laugh, they don't get as anxious, and they deal better with pain and do better in the hospital," Zeltzer said. "What we don't know, and what we hope to find out, is whether laughter actually makes a physical difference in such things as speed of healing." (About.com Newscenter, Feb. 2000)

Need for the Study

Research on stress has shown that bad stress suppresses the immune system. Dr. Stanley Tan and Dr. Lee Berk of Loma Linda University studied two types of stress: good and bad stress. Laughter is a form of good stress—or stress in reverse. They studied
groups of average adults and found that both areas of the immune system received a boost from laughter. Subjects faced a solid hour of induced laughter from videos of comedians, while a control group sat quietly out of earshot. The doctors took blood samples at 10 minute intervals before, during and after the laughter workout. They discovered that humor and exercise trigger similar physiological processes. The laughter group showed increases in the good hormones, such as endorphins and neurotransmitters and decreased levels of stress hormones, cortisol and adrenaline. When the body releases tension from laughter, the elevated levels of the body’s stress hormones drop back to normal, allowing a person’s immune system to work more effectively. Cells which produce anti-bodies increase in number and T-cells which combat viruses are activated and ready for battle. Our natural killer cells then increase in number and activity. All of this occurs as a direct result of laughter! To quote Dr. Tan, “All these neuro-hormones act like an orchestra, each instrument makes a particular note. Laughter causes the entire orchestra to be more melodious or balanced. In other words, laughter brings a balance to all the components of the immune system.” (About.com Newscenter, Feb. 2000)

**Purpose of the Study**

The purpose of this study was to examine the therapeutic and healing benefits of laughter in the life of an individual suffering from a severe illness. In the literature review, particular attention was noted to the positive effects that laughter may have on immune system functioning. Experts believe that, when used as an addition to conventional care, laughter can reduce pain and aid the healing process. Laughter offers a powerful distraction from pain.
Definition of Terms

Remiss: negligent in the performance of work or duty

Immune: having a high degree of resistance to a disease

Physiological: characteristic of or appropriate to an organism’s healthy or normal functioning

Platelet: a minute flattened body (as of ice or a mineral)

Gamma-interferon: of, relating to, or being on of three or more closely related chemical substances

Immunoglobulin A: any of the vertebrate serum proteins that are made up of light chains and heavy chains usually linked by disulfide bonds and include all known antibodies.

Oxygenation: the process of impregnating, combine or supplying the blood with oxygen

Mirth: gladness or gaiety as shown by or accompanied with laughter

Disposition: the tendency of something to act in a certain manner under given circumstances
CHAPTER 2

LITERATURE REVIEW

Introduction

Adults laugh approximately 15 times per day, while children laugh about 400 times a day! Laughter is not the same as humor. Laughter is the physiological response to humor. Laughter consists of two parts-a set of gestures and the production of a sound. When we laugh, the brain pressures us to conduct both those activities simultaneously. When we laugh heartily, changes occur in many parts of the body; even the arm, leg and trunk muscles. Under certain conditions, the human body performs what the dictionary terms as “rhythmic, vocalized, expiratory and involuntary actions” actions; better known as laughter. People often store negative emotions, such as anger, sadness and fear, rather than expressing them. Laugher provides a way for these emotions to be released; laughter is used as a cathartic mechanism. Increasingly, mental health professionals are suggesting “laughter therapy,” which teaches people how to laugh at issues that are seldom perceived as funny and to cope in difficult situations by using humor. Following the example of a real-life funny doctor, Patch Adams (portrayed by Robin Williams in a movie by the same name), many doctors and psychiatrists are becoming more aware of the therapeutic benefits of laughter and humor. (www.howstuffworks.com)

Fifteen facial muscles contract and stimulation of the zygomatic major muscle (the main lifting mechanism of your upper lip) occurs. Meanwhile, the respiratory system is upset by the epiglottis semi-closing the larynx, so that air intake occurs irregularly, thus causing a gasp effect. In extreme circumstances, the tear ducts are activated, so that while the mouth is opening and closing and the struggle for oxygen intake continues, the face
becomes moist and often red (or purple). The noises that usually accompany this bizarre behavior range from sedate giggles to boisterous outbursts. (www.howstuffworks.com)

Also, one of the key features of natural laughter is its placement in speech, linguists say. Laughter usually occurs during pauses at the end of phrases. Experts say this suggests that an orderly process (probably neurologically based) governs the placement of laughter in speech and gives speech priority access to the single vocalization channel. This strong relationship between laughter and speech is much like punctuation in written communication; hence the term "punctuation effect."

(www.howstuffworks.com)

Behavioral neurobiologist and pioneering laughter researcher Robert Provine joked that he had encountered one major problem in his study of laughter. The problem was that laughter disappeared just when he was ready to observe it, especially in the laboratory. One of his studies looked at the sonic structure of laughter. He discovered that all human laughter consists of variations on a basic form that consists of short, vowel-like notes repeated every 210 milliseconds. Laughter can be of the "ha-ha-ha" variety or the "ho-ho-ho" type, but not a mixture of both, he says. Provine also suggests that humans have a "detector" that responds to laughter by triggering other neural circuits in the brain, which, in turn, generates more laughter. This explains why laughter is so contagious.

Humor researcher Peter Derks describes laughter response as "a really quick, automatic type of behavior. In fact, how quickly our brain recognizes the incongruity that lies at the heart of most humor and attaches an abstract meaning to it determines whether we laugh," says Derks. (www.howstuffworks.com)
In certain clinics, laughter is beginning to take the place of anti-depressant drugs, which reduces the need for painkillers. According to psychiatrist Robert Holden, who directs the laughter clinics for England’s National Health Services, “smiling and laughing produce happy chemicals called endorphins which work in the brain to give an overall feeling of well-being.” (www.hey lady.com)

Evolution of Laughter

According to John Morreall, a philosopher at the University of South Florida, the first human laughter may have begun as a gesture of shared relief at the passing of some form of danger. Morreall speculates that it is “a signal that now we can relax.” When someone laughs, muscles relax throughout the body. Since this relaxation inhibits the biological fight or flight response, laughter may be a signal of trust in one’s companions, or a “ritual disarming.” (www.globalideasbank.org)

“Laughter occurs when people are comfortable with one another, when they feel open and free. And the more laughter, the more bonding within the group,” says Mahadev Apte, a cultural anthropologist at Duke University in Durham, North Carolina. This feedback loop of bonding-laughter-more bonding, and the desire not to be singled out from the group, may explain why laughter is often contagious. (www.globalideasbank.org)

“Laughter”, says Provine, “like other human behavior, must have evolved to change the behavior of others. During an embarrassing or otherwise threatening situation, laughter may serve as a gesture of appeasement, a way of deflecting anger.” Also, if the threatening person joins the laughter, the risk of confrontation may dissipate. “If I can
change our discourse from serious to not serious, I’m not threatened so much any more,” says Laurence Mintz, a cultural historian at the University of Maryland in College Park. (www.globalideasbank.org)

Physical Health During Laughter

The process of belly laughter results in definite muscle relaxation. When a person laughs, the muscles (that do not participate in the belly laugh) relax. After one finishes laughing, the muscles involved in the laughter begin to relax. Therefore, the action takes place in two stages. Regarding cardiac exercise, a belly laugh is equivalent to an “internal jogging.” Laughter can provide good cardiac conditioning, especially for those who are unable to perform physical exercise. Laughter also assists in reducing stress hormones. Laughter reduces at least three neuroendocrine hormones associated with stress response. These include epinephrine, cortisol, and dopamine. Laughter also assists in immune system enhancement. Many clinical studies have shown that humor strengthens the immune system. During pain reduction, humor allows a person to “forget” about pains such as aches, arthritis, etc. In addition, blood pressure during laughter is affected; women appear to benefit more than men in preventing hypertension. Finally, during respiration, frequent belly laughter empties the lungs of more air than it takes in, resulting in a cleansing effect-similar to deep breathing. This is especially beneficial for patients who are suffering from emphysema and other respiratory ailments. (www.holisticonline.com)

The Limbic System

The limbic system is a large part of the laughing process. The limbic system is a network of structures located beneath the cerebral cortex. This system is important
because it controls some behaviors that are essential to the life of all mammals. Interestingly, the same structures found in the human limbic system may also be found in the brains of evolutionary ancient animals such as the alligator. In the alligator, the limbic system is heavily involved in smell and plays an important role in defending territory, hunting and eating prey. In humans, the limbic system is more involved in motivation and emotional behaviors. While the structures in this highly developed part of the brain interconnect, research has shown that the amygdala, a small almond-shaped structure deep inside the brain, and the hippocampus, a tiny, seahorse-shaped structure, seem to be the main areas involved with emotions. The amygdala connects with the hippocampus as well as the medial dorsal nucleus of the thalamus. These connections enable the limbic system to play an important role in the mediation and control of major activities such as friendship, love and affection, as well as the expression of mood. The hypothalamus, particularly its median part, has been identified as a major contributor to the production of loud, uncontrollable laughter. (www.faculty.washington.edu)

Laughter-Immune Therapy

The physiological study of laughter has its own name, labeled “gelotology.” Research has shown that laughing is more than just a person’s voice and movement. Laughter requires the coordination of many muscles throughout the body. However, laughter is not always good medicine. There are a few cases when laughing actually caused a heart attack or a stroke. Additionally, immediately after abdominal surgery, patients should not laugh too hard because they could tear out their stitches accidentally. Those patients suffering from broken ribs are also advised to be careful when laughing. (www.unisci.com)
How laughter affects the nervous system and the rest of the body is not completely understood. A new area of neuroscience termed “psychoneurimmunology” studies the interactions between the brain and the immune system. The field of psychoneuroimmunology combines the methods and techniques of psychology, neuroscience and immunology. Psychoneuroimmunological experiments usually focus on how stress affects the nervous system and disease states. Laughter has been proven to cause changes in the autonomic nervous system, as well as alter stress hormones and neurotransmitter levels. Laughter is one of the body’s safety valves; a counter balance to tension. When the tension is released, the elevated levels of the body’s stress hormones drop back normal, thereby allowing our immune systems to work more effectively.

(www.angelfire.com)

Laughing 100 times is the equivalent to 10 minutes on the rowing machine or 15 minutes on an exercise bike! Humor is a great way to get in touch with one’s feelings and maintain some control over them in difficult situations. Laughing causes many people to feel good for a reason. The physiological effects on the body perform many amazing feats. For instance, laughter appears to reduce levels of certain stress hormones and growth hormones. Laughter provides a safety valve that shuts off the flow of stress hormones and the fight-or-flight compounds that come into action in times of stress, rage or hostility. Stress hormones suppress the immune system, increase the number of platelets (which can cause obstructions in arteries), and raise blood pressure. Laughter also helps to increase the immune system. When in a state of elation, natural killers that destroy tumors and viruses increase, as do Gamma-interferon (a disease fighting protein) T-cells, which are a vital part of the immune response, and B-cells, which make disease-
destroying antibodies. It also increases the concentration of salivary immunoglobulin A, which defends against the entry of infectious organisms through the respiratory tract. Laughter essentially brings balance to all the components of the immune system. Also, blood pressure is lowered, and there is an increase in vascular blood flow, as well as an increase in oxygenation of the blood which further assists healing. Laughter may cause hiccups and coughing, which will clear the respiratory tract by dislodging mucus plugs. Laughter also gives your diaphragm, abdominal, respiratory, facial, leg and back muscles a workout. So essentially, laughter is an all over body workout. It is possible to have fun, keep fit, and stay healthy in one easy step—just laugh! There also has been some belief that laughter may help prevent many life-threatening diseases such as heart disease.

Anger and fear are two common emotions frequently responsible for the cause of heart attacks. (www.thinkquest.org)

Humor as a Diagnostic Tool

In “Anatomy of an Illness”, late editor Norman Cousins described how he recovered from a typically irreversible and crippling connective tissue disease with a regimen that including laughing at Marx Brothers’ movies. Cousins found relief for the pain of his degenerative disease when he laughed his way to health by watching humorous videos.

Another interesting side note is that faking laughter will also cause the body to respond as though the laughter is real. The physiological changes we discussed that occur with real laughter will also take effect even when we just pretend to laugh. There is definite truth is the saying “He who laughs...lasts!” (www.heylady.com/rbc/laughter)
If humor is listened to carefully, it may assist in realizing a person’s fears or worries. When a person jokes around, he or she may be indirectly giving the impression that something is bothering him. The old adage, “Many a truth is said in jest” is applicable in this situation. Humor may be an important, often overlooked tool. The more adjusted one is, chances are the more satisfying a lifestyle one will lead. In addition, a person who maintains a positive disposition is more apt to respond to the humor in jokes, cartoons, and everyday situations. It is this researcher’s belief that one should try to find humor in everyday events.
CHAPTER 3

METHODOLOGY

Introduction

The purpose of this study was to examine the therapeutic and healing benefits of laughter in the life of an individual suffering from a severe illness. Studies involving laughter have shown that laughing does assist in reducing pain during the healing process and may prevent certain illnesses by increasing endorphin levels. It is this researcher’s belief that the ability to maintain humor is beneficial for the overall disposition and spirit of a person.

Research Design

This investigation was designed as a descriptive study and will be examined as a case study of an individual. The purpose of a descriptive research design is to "systematically describe the facts and characteristics of a given phenomenon or area of interest" and the following case study is an "intensive description and analysis of a phenomenon or social entity such as an individual, group, institution, or community" (Merriam and Simpson, 2000, p. 109). This case study description is concerned with the phenomenon of laughter as it exists at this particular time and entails the examination of laughter’s healing effects to the immune system. This researcher conducted an interview with an educator and cancer survivor who strongly believes humor is a therapeutic tool and recommends that humor be incorporated in life as a part of a daily routine.

Source of the Data

Information gathered from the literature review was combined with interview data from a cancer survivor to draw conclusions about the positive effects of laughter on the
healing process of individuals suffering from severe illnesses. The interviewee was asked various questions regarding the subject of laughter. This interview was conducted in her home over a period of two hours.

Assumptions and Limitations

The findings from this case study "cannot be generalized in the same manner as findings from random samples; generalizability related to what each user is trying to learn from the study." (Merriam and Simpson, 2000)
CHAPTER 4
CASE STUDY INTERVIEW

Introduction

Sandra Cohen is a retired educator and a firm believer in the power of laughter to overcome illness. She has battled cancer three times over the past fifteen years and feels that her courage to laugh aided her during the most frightening times of her illness. She has participated in many twelve-step support groups and often speaks to various organizations regarding her coping methods during her devastating diagnoses. The interview took place in her home and involved the discussion of humor as treatment during her illness. Our discussion involved the use of humor in her life and how she has faced adversity through humorous outlooks and spiritual strength.

How did cancer affect your willingness to laugh at your situation?

Regarding my cancer, I realize that laughter and willingness to be optimistic was essential to my recovery. It gave me strength while coping with a life threatening illness. In the beginning, I felt my diagnosis was unfair and extremely frightening; however I realized I needed to maintain a positive attitude or else my fear would consume my body and my fight for survival. I have had guilt feelings over the physical, mental and spiritual methods I previously used by taking myself as well as life events too seriously. I felt in the past I was very self-centered and did not incorporate God in my life. Now, I am very spiritual and feel my connection with God has helped me in my recovery of my illness. I realized that when I forget to laugh at myself, especially as well as at people places and things in my life, it seems to bring about a relapse of toxicity. It is important to be aware of God’s presence and be thankful for my health and the ability to feel joy each day.
Did you ever feel laughter was misused while you were battling cancer?

Laughing aloud may be misunderstood and may not be appropriate such as in a devastating accident or life threatening illness. However, using humor in a kind considerate fashion may lighten the atmosphere and relieve tension. Appropriateness and being politically correct are key.

Are there ever times you feel laughter is inappropriate in certain situations?

Yes, when someone takes pleasure in another's misfortune or at another's expense. For example, while watching Holocaust documentaries where Nazi officers delighted in torturing prisoners; and when I see violence and macabre situations depicting insane and maniacal behaviors. Also, when the phrase "I've fallen and I can't get up" became a reality and my mother-in-law fell and broke her up and later was hospitalized. There was also a time when I fell after my surgery in my room and was immobilized for a few minutes; that was very scary for me.

What aspects of your life cause you to laugh?

My grandchildren, my little puppy, my children, my husband, my lighthearted friends, comedies shows, funny movies, silly songs, music, a good joke, a pun, and humorous books.

How do you incorporate humor in the classroom?

Students really appreciate a humorous attitude. It creates an atmosphere conducive to communication and learning. This makes my job and student participation more fun and enjoyable. Often times it can eliminate the air the hostility or tension in school. I can recall one instance when I was observed during an evaluation by my
administrator. I had made an error by mispronouncing a word and said something funny to diffuse the situation. I admitted being human and used humor in the situation. Later, I discovered the administrator commented on this in my evaluation about the positive use of humor I chose in that particular situation.

**Have you always incorporated humor in your life or at what age did you realize it was an effective tool in coping?**

I was always serious as a youngster and did not laugh often. Around the age of 40, I really knew to lighten up and not take life too seriously. Someone told me, “Sandi, you need to lighten up.” I have made a conscious pursuit in my old age to laugh more than cry and to laugh so hard that I cry!

**Did your family use humor to ease stressful situations?**

My family laughed a great deal and I do recall laughing quite a bit as a child; however not to the extent I do now.

**What are some of your favorite funny movies?**

I love movies such as Office Space, Best in Show, Out to Sea, The Money Pit, and Rush Hour.

**Who are some of your favorite comedians?**

I really enjoy Jim Carrey, Walter Matthau, Cid Caesar, Robin Williams and Billy Crystal.

**Have you seen Patch Adams and what do you think of the film?**

Yes, I really enjoyed Robin Williams and the movie. I think his attitude toward illness was wonderful. He was so wonderful with the patients and used humor in a
positive fashion. I think every hospital would benefit from a doctor like the one he portrayed in the film.

**Do you believe that just by smiling one could feel better mentally?**

I believe the power of a smile can work wonders. Laughing at myself breaks down barriers with others and eases many situations. Eventually, if I keep smiling, I start to feel better about my surroundings and I notice my mood improves.

**Do you believe it is important to laugh daily?**

Yes, there would definitely be a hole in my soul if I did not laugh every day. I believe everyone should take time to laugh and appreciate how fortunate we are to be able to feel the pleasure of a warm smile and a great laugh.

**Do you believe laughter aides in healing the body?**

Absolutely, the process of releasing endorphins in the blood system affects the physiological state of the body. I believe laughter helped me overcome great adversity when I experienced such depression during my illness. Laughter, I feel, really does help to heal one’s physical and mental state during stressful times.

**How do you diffuse stressful situations when it is difficult to use humor?**

Meditation is always helpful for me, as well as getting on my knees to pray. Also, I make a conscious contact with a higher power, say the serenity prayer and adopt an attitude of gratitude. I also repeat positive affirmations and exercise daily.

**How often do you laugh?**

I try to laugh as often as I can. In this world, it is essential.
CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The study examined various ways that laughter can be used as therapy for overcoming illness. Gelotology, the study of laughter and psychoneuroimmunology were discussed, in addition to the overall physical health benefits of laughter. Interview data was also collected as evidence to support this researcher’s belief in the therapeutic effects of laughter for those suffering from illness.

Conclusions

The information presented provides an overall positive view of the therapeutic significance of humor both emotionally and physically. From the information presented by this researcher, it can be assumed that humor plays a crucial role in the prevention and suppression of illness and stress in everyday life.

Recommendations

This researcher recommends that in addition to traditional and holistic medicine, laughter may be used as a defense in the healing process, however grave the illness. This researcher finds laughter essential and recommends that it be incorporated in each person’s daily routine. For this researcher, one would truly be remiss without having laughed at least a few times per day. It was this researcher’s intent to bring an awareness of the healing power of laughter and to hope that in the future, when stories of life threatening illness are told and those precious lives are saved, this will be attributed to the natural gift of laughter.


