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Exercise in Antiquity and Modern Times: Catholicon for Healthy Living

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Abstract

Ancient physicians such as Herodicus, Hippocrates and Galen recommended exercises as panacea for healthy living in antiquity. Modern scholars such as Christos and Tipton have variously demonstrated the importance of exercises and sports in ancient and modern European societies citing exercises as treatments for some illnesses by the doctor in the *Hippocratic Corpus*. This paper examined the importance of exercise in antiquity and modernity, even as it serves as a catholicon for healthy living, with a view to identifying the values and relevance of exercise in dealing with illnesses and promoting good health. Sallis and Owen behavioural epidemiology was adopted as theoretical framework. The historical and comparative methodologies were adopted as the study examined the historical trajectory and cross-cultural variations of exercise in antiquity and today's world. The discourse in this study demonstrated that exercise has been functional as medicine and for healthy living in antiquity and modernity. Medical practitioners, exercise physiologists, including laymen understand its importance and further recommend exercise suitable for people of varying ages. Further studies may be

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designed to examine low to medium and medium to high intensity exercise and its health implications.

Key Words: Exercises, Health, Antiquity, Modernity

Introduction

Physical exercise is an activity characterised by vigor. Kylasov and Gavrov (2011) defined exercise as a structured physical activity that improves physical fitness and overall healthiness and wellness. Ancient medical physicians such as Hippocrates (1931), and Galen (1997) informed us of the importance of exercise in antiquity even as exercises were part of the prescription for treating some illnesses. The Hippocratic corpus (1931) explained the correlation between regimen, age and exercise, and the characteristics/properties of exercises. Galen (1997) on the other hand, demonstrated that hygiene is an important facet of medicine and that exercise is a major offshoot of hygiene. Galen explained that unless movement is vigorous, it cannot be considered as exercise. The works of these two ancient medical practitioners have been the bedrock and sources on exercises and other aspects of health. Modern authors continue to take recourse to these ancient sources even as they provide a history of exercise and its importance in medicine. Ancient authors and modern scholars have variously discussed the effects of exercises in the life of a man. However, little or no effort has been focused on the comparative possibility of exercise in antiquity and its correlates in modern times as it affects human life and living. This paper attempts to examine that.

The study adopted the historical and comparative methodologies as it examined the historical trajectory and cross-cultural similarities and variations of exercise in antiquity and today's world. The paper also examined the effects of exercise in antiquity and its advocacy in today's world. The adherence to the advice that exercise is medicine in antiquity and in our contemporaneous times was examined. The study highlighted the importance of exercises in both periods under study. Ancient medical physicians such as Hippocrates (1931) and Galen (1951) are sources for the importance of exercises in health in antiquity. The works of experts in exercise physiology served as sources for exercise in our contemporary times.

Sallis and Owen behavioural epidemiology was adopted as theoretical framework. Behavioural epidemiology refers to an approach to a research method which hinges on policies relating to physical activity and health. It also establishes findings from recent studies on the relationships between physical activity, health and population studies of levels of participation and the socio-demographic characteristics of those who are, and are not, physically active. Furthermore, this study opts for Sallis and Owen behavioural epidemiology, because it directly relates physical activity to health. It therefore means that physical activity participation behaviour is a correlate to good health acquisition.

Exercise in Antiquity

In antiquity, dating from the Cretan-Mycenean era (3000 BC) to the post-Hippocratic era (370 BC), philosophers and physicians recommended exercise as a means to healthiness and wellbeing. They documented the prophylactic and therapeutic benefits of exercises. Pythagoras was one of such philosophers. Iamblichus (1818) stated that the Pythagoreans or adherents of Pythagoras' philosophy complied with a "structured life of religious teaching, common meals, exercise, reading and philosophical study." Elliot (1971) and Gordon (1949) established the fact that Pythagoras (570-490 BC), an athlete and a medical philosopher, was an advocate of

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exercise for healthy living. Pythagoras is known as a renowned mathematician and an astronomer. He established a school at Croton where he taught, following the religious teachings of Orpheus, science and philosophy. Vogel (1966) noted that Pythagoras' school was a philosophical medical Centre, and that he, Pythagoras, was a medical philosopher because he taught and recommended that his followers observed a regimen of diet, exercise, music, and mediation. The exercises included; boxing, running, wrestling, long walks and discus throwing. Pythagoras also taught that the gods were not responsible for diseases but that men suffered from diseases due to absence of "harmony between the elements, qualities and tendencies of the bodies" (ibid).

Another ancient physician who emphasized on the therapeutic effects of exercise (Light 1965) was Herodicus (500 BC). He used to be the teacher of Hippocrates (Sigerist 1961), and he was a physician whose specialty was dietetic medicine. Herodicus has been recognized as the father of sports medicine. Georgoulis, *et al.* (2007) noted that Herodicus was criticized by Hippocrates and Plato for recommending too strenuous, exercises, for his patients.

Hippocrates who lived between 460 and 370BC was another physician who advocated exercises for the body for healthy living. He stated that "eating alone will not keep a man well, he must also take exercise" (*Hippocratic Corpus,* translated by Jones, W.H.S.1923). Singer (1922) states that Hippocrates was referred to as the father of scientific medicine. Hippocrates stated that, ". . . food and exercise, while possessing opposite qualities, yet work together to produce health" (*Hippocratic Corpus,* translated by Jones, W.H.S.1923). Hippocrates did prescribe exercise as part of treatment for a patient suffering from consumption or tuberculosis; the prescription was walking. Hippocrates went on further to note that moderate exercises warmed and thinned the body, purged away humor and dealt with obesity. He also stated that inactivity, disproportionate exercises and intake of less food could cause diseases (ibid). Furthermore, Hippocrates emphasized the importance of exercises in *Acute Diseases* when he stated that exercises contribute towards the recovery of the sick and of immense benefit to the health of whosoever adopted it (*The Genuine Works of Hippocrates: Acute Diseases,* P. 62, translated by Adams, F. 1939).

Archagathus of Peloponesia who settled in Rome at about 219 BC and Aselepiades of Bithynia in Greece (124 or 129-40 BC), were also physicians who believed in exercises as treatment to diseases. Scarbrough (1969) informs us that both prescribed walking exercises for patients who were suffering from consumption, dropsy and hemiplegia.

Aulus Cornelius Celsus (25 BC-50 AD), the physician who authored *De Medicina,* wrote that medicine was a composition of a triangle of emphasis among dietetics, pharmacology, and surgery. He stated that dietetic is a combination of food and fluid consumption, exercise, bathing, and relaxation. The exercises included reading aloud, drill, walking leisurely, and mild running (*De Medicina Books I-V,* translated by Spenser, 1935).

With Galen or Claudius Galenus (129-210 AD), exercise was a means of treating illnesses in medicine. To Galen, hygiene was an important aspect of medicine and exercise was an important arm of hygiene. Galen stated that the usefulness of exercises was in twofold; the first one was for the evacuation of excrements, and the second one was for the good form of the body. Further benefits of exercises according to Galen were; insensitivity and strength and function of the organs, readier metabolism, better nutrition and diffusion of all substances (*Galen's hygiene (De sanitate tuenda),* translated by Green, Charles, Thomas 1951). Berryman

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(2003; 2010) documented that Galen's influence in the use of exercise in medicine endured for over one thousand and four hundred years. Longet (1842) noted that Galen was a physician whose theory and concept influenced greatly, the practice of medicine. He further documented that Galen was famous for his use of exercise in his treatment of patients diagnosed with various diseases. Galen noted that these factors could aid in healing the body and getting rid of diseases. The factors included: "things consumed, things being eliminated from the body, exercises such as walking, riding, massage and sleep, and things happening from without." Siegel (1973) and Berryman (1989) both documented that Galen developed a medical theory based on the concept of natural conditions. This theory included natural and non-natural conditions. The natural conditions were "kata physin and diseased, and pathological. The non-natural conditions included air; motion and rest; sleeping and waking; that which was taken in; that which was secreted; and emotions and passions" (ibid). Galen categorized exercise as vigorous as to cause laboured breathing. He also thought that exercise was motion that was slow, swift, atony, vigorous, gentle and violent. He noted that exercise that were prescribed for health purposes must be moderate (Tipton, 2008). Galen further recorded that the kind of exercise that should interest one was the exercise with the small ball. Galen stated; "The form of exercise deserving our attention is therefore that which has the capacity to provide health of the body, harmony of the part, and virtue in the soul, and these things are true of the exercise with the small ball" (*Galen: Selected Works*, p. 302, translated by Singer, 1997). Galen prescribed exercises for patients who were suffering from diseases such as arthritis, depression, dropsy, epilepsy, gout, tuberculosis, and vertigo (*Galen' Hygience (De Sanitate Trenda)*, translated by Green, 1997). Galen taught that exercises are responsible for the thinning of the body, hardening and strengthening of the muscles and elevating blood volumes and of course, achieving a healthy condition for the one who practices it (ibid).

Exercise in Modern Times

In today's narratives and actions, fitness practices are being utilized for healthy living. Medical practitioners and exercise physiologists advise and encourage people to make exercise a part of life. Several other health and sports organizations also attest to the importance or relevance of exercises or sports to life and healthy living. Nomikos, Trompoukis, Lamprou, and Nomikos (2016) discussed the importance of exercise in antiquity as well as in today's America. They stated that various research studies have shown that exercise is important in preventing and treating both physical and mental health. It is so important that the American College of Sports Medicine (ACSM), with support from the American Medical Association and Office of the Surgeon General have launched a campaign with a view to mobilizing health care providers to incorporate exercises in their practices with people in order to manage or treat diseases that impair health and quality of life. Blair (2009), stated that physical inactivity is the biggest problem of the 21st century with regards to health and healthy living. Tipton (2014 pp.6-9) stated that exercise prescription for health and disease prevention began in antiquity. He further argued that Susruta of India and Hippocrates of Greece were physicians who had prescribed exercises as catholicon for healthy living. Hippocrates prescribed exercise for a patient suffering from consumption. It has been noted that exercise can help in the treatment of obesity, diabetes and a sedentary lifestyle. Jonas and Phillips (2009) maintained that a lifestyle of exercise has several health benefits for the participant. They recommended 30 minutes of moderate physical activity for at least five days weekly, or 20 minutes of vigorous exercise for at least three days weekly. They also advised doctors to be cautious to ensure that their patients

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maintain safety even in this regime; a balance to the exercises would ensure success for the participant. Machado (2017) noted the importance of regular aerobic exercises in the treatment of mild to moderate major depression. Blumenthal, Babyak, Doraiswamy, Watkins, Hoffman et *al* (2007) stated that participants enjoy physiological, psychological and social benefits through exercises. Aerobic exercises contribute to autonomic balance which effects can improve mental health. The American Heart Association recommended that adults should: get a minimum of 150 minutes of moderate or 75 minutes of vigorous exercises per week or a combination of both; moderate to high intensity muscle strengthening activity; avoid sitting for long hours; and be active for at least 300 minutes or five hours per week. They also recommended that 3-5-year olds should be encouraged to be physically active; 6-17-year olds should get 60 minutes moderate aerobic activity in a day. Saraulli *et al.* (2017) stated that physical exercise causes brain wellbeing due to its effective neuroprotective action and low social cost.

Benefits of Exercise to Health

This study documents several, among others, of the benefits of exercise to health. Several epidemiological and clinical studies have established that exercise has many profoundly positive underpinning effects on physical fitness and health. The primary primitive effect of exercise is that it extends life span and enhances working capability, as well as physical fitness. Physical fitness is the body's ability to function efficiently and effectively. It is defined as a set of physical attributes that allow the body to respond or adapt to the demands and stress of physical effort.

Exercise Controls Human Weight

It is a well-known fact that exercise helps to maintain or reduce one's weight especially with obese people. Klein *et al.* (2004) stated that obesity has implications for cardiovascular diseases such as coronary heart disease, heat failure, stroke, ventricular dysfunction, and cardiac arrhythmias. While some scholars such as Miller *et al*. (1997) and Curioni & Lourenco (2005), argued that exercises alone are not sufficient towards weight loss without maintaining the right diet; others stated that exercise (aerobic) alone can lead to weight loss. Donnelly *et al.* 2013, stated that aerobic exercise alone aids in weight reduction among obese men and women and those who maintain a sedentary lifestyle. Swift *et al* (2013) documented that a very high volume of exercise training can result in clinically weight loss. Haskell *et al* (2007) stated that obese people would enjoy cardiovascular benefits if high physical activity and exercise training form an integral part of treatment for obese people. Many medical practitioners, gym instructors and exercise physiologists would advise a diet and exercise regime in order to achieve desired results with maintaining or reducing weight. These exercises among others will go a long way in contributing to one's health. 150 minutes of moderate intensity aerobic activity, 75 minutes of vigorous intensity aerobic activity, or an equivalent mix of the two per week is a good place to start.

Exercise Reduces the Risk of Cardiovascular Disease

Heart disease and stroke are two of the leading causes of death in the United States. One of the causes of premature disability and death in women worldwide, is coronary heart disease (Stampfer *et al.* 2000). These can be linked to physical inactivity among others. But following the guidelines and getting at least 20-60 minutes/3 days per week of moderate intensity of

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sporting and recreational activity can put one at a lower risk for these diseases. It is possible to reduce risk even further with more physical activity. Regular physical activity can also lower blood pressure and improve cholesterol level. Shashi (2012) and Schuler *et al*. (2013) noted that cardiovascular disease is preventable, however inactivity or a sedentary lifestyle, has implications for increased cardiovascular disease, obesity, diabetes mellitus cancer and even death. It has been noted that people who are less physically active are prone to heart diseases.

Exercise Reduces the Risk of Type 2 Diabetes and the "Metabolic Syndrome"

It has been noted that exercise or physical activity is an integral component in the prevention and treatment plan of type 2 diabetes. Regular sporting activities can reduce the risk of developing type2 diabetes and metabolic syndrome. Metabolic syndrome is a condition in which one has some combination of too much fat around the waist, high blood pressure, low HDL cholesterol, high triglyceride, or high blood sugar. And the more physical activity one does, the lower the risk will be. Colberg et al. (2010) and McCarthy (2015) agreed that exercise can and does reduce the risk of type 2 diabetes. They noted the acute and chronic effects of exercise training in patients with type 2 diabetes. The effects include: reduction in weight, reduction in the risk of mortality and cardiovascular disease, reduction of hypertension and metabolic control. Balducci *et al.* (2006) also stated that exercise do have implications for the prevention of type 2 diabetes. In other words, the benefits of exercise for patients with type 2 diabetes are; your body uses insulin in such a way that it controls your blood sugar, it burns fat. The following strengthens the muscles, reduces blood pressure, cuts LDL (bad) cholesterol, increases HDL (good) cholesterol, improves blood flow, reduces the risk of stroke and cardiovascular diseases; it boosts energy and reduces stress.

A new study conducted by the University of Eastern Finland stated that vigorous exercise reduces the risk of type 2 diabetes and cardiovascular diseases in children (Health Europa, 2018). Exercises that are beneficial to patients with type 2 diabetes include: 150-minute aerobic exercise three days a week such as brisk walking and done in such a way that raises the heart rate. Others include; continuous activity (walking, using the stairs, and moving around all day); aerobic exercises (brisk walking, swimming or dancing); strength training (lifting weights); and flexibility exercises such as stretching (American Diabetes Association, 2018).

Exercise Reduces the Risk of Some Major Cancers

Several studies have shown that exercise reduces the risk of mental health as well as other diseases such as some certain kinds of cancers. Being physically active in sports lowers the risk for colon, breast and endometrial cancers. Moore *et al.* (2016) noted that physical activity reduces the risk of several cancers such as esophageal, liver, kidney, lung, stomach cancer of the cardia (top portion of the stomach), endometrial, myeloid leukaemia, myeloma, colon, head and neck, rectal, bladder and breast cancers. People who participate in sports have a lower risk of colon cancer than do people who are not active. Women who participate in sports and recreational activity have lower risk of breast cancer than do women who live near sedentary life. Moore et al, suggested that physical activity should be promoted in order to help reduce the risk of cancer in the efforts of attempting to prevent and control cancer. It is recommended that healthy adults aged between 18 and 65, should participate in 150 minutes per week of brisk walking, as well as a healthy diet, as this would reduce the risk of cancer (Wiley-Blackwell, 2010). They recommended that active people should continue to exercise irrespective of their ages.

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Exercise Improves Mental Health and Mood

Regular physical activity can help keep thinking, learning and judgmental skills sharp as one ages. It can also reduce the risk of depression and may help keep better mental health. Research has shown that doing aerobics or a mix of aerobic and muscle-strengthening activities 3 to 5 times a week for 30 to 60 minutes can give mental health benefits. Some scientific evidence has also shown that even lower levels of physical activity can be beneficial. Exercise reduces anxiety, depression and negative mood even as it improves self-esteem and cognitive function (Callaghan, 2004). Sharma *et al.* (2006) documented that lifestyle modification can become important in individuals diagnosed with serious mental illness. Guszkowska (2004) also stated that aerobic exercises such as swimming, cycling, jogging, walking, gardening and dancing have proven to reduce anxiety and depression thereby producing a healthy mood for the individual. Guszkowska continued to state that the improvements in the mood of the individual are proposed to be caused by "exercise-induced increase in blood circulation to the brain and by an influence on the hypothalamic-pituitary-adrenal (HPA) axis and, thus, on the physiologic reactivity to stress." Richardson *et al.* (2005) suggested life style changes that focus on the increase of moderate and intense physical exercises, for they may be the most appropriate for patients with mental health. The anti-depressant effect of regular exercise is comparable to the potent anti-depressant like Zoloft (Sertraline). Such regular exercise is 30 minutes of moderate to intense physical activity a day, for three to five days a week.

Exercise Improves New Brain Cell Development that Leads to Cognitive and Memory Retention

Sports and recreational activities stimulate the formation of new brain cells. Research has shown that the areas of the brain that are stimulated through exercise are responsible for memory and learning, for older adults who engage in regular exercise have better performance in tests implying decision-making process and problem solving. DiSalvo (2013) stated that regular endurance exercise such as jogging, strengthens and grows the brain. The exercise stimulates the production of the protein FNDC5 (fibronectin type III domain containing 5) into the bloodstream. While one consistently exercises, the FNDC5 then intensifies the production of another protein in the brain called Brain Derived Neurotrophic Factor (BDNF). This protein in turn fuels the growth of new nerves and synapses and also conserves the survival of the remaining brain cells. It has been noted that the hippocampus, which is the centre of emotion, memory and the autonomic nervous system, shrinks in late adulthood and so leads to impaired memory and the risk of dementia. However, Erickson *et al.* (2011), having done a randomized controlled trial with 120 older adults, note that with aerobic exercise, hippocampal volume is increased by 2 percent and reversing age-related loss which is accompanied by improved memory function. Duzel *et al.* (2016) also agreed that lack of exercise is a risk factor for cognitive decline such that the hippocampus is comprised in late adulthood, and also due to neurodegenerative conditions such as Alzheimer and fronto-temporal dementias. Therefore, start exercising and start running, consequently, and watch your brain cells grow.

Exercise Improves Sexual Function and Better Sex Life

Regular involvement in sports and recreation improves or maintains better sex life. Physical improvement in muscle strength and tone, endurance, body composition and cardiovascular function. All these enhance sexual functioning in both men and women (Lorenz & Meston

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2014). Research discovered that men who exercise regularly are less likely to have erectile dysfunction and impotence than men who do not (London & Vega 2015).

Exercise Causes Physical Fitness

Physical fitness is the body's ability to function efficiently and effectively. It is defined as a set of physical attributes that allow the body to respond or adapt to the demands and stress of physical effort. Physical conditioning however, is the performance capacity of an individual. Physical conditioning refers to the development of physical fitness through the adaptation of the body and its various systems to a sporting exercise programme. This implies that though two or more people may be physically fit, one of them may be found to be better conditioned due to his level of sport and recreational training or participation.

Components of Physical Fitness

One of the most acceptable definitions of physical fitness was that 'physical fitness is the ability to carry out daily tasks with vigour and alertness, without undue fatigue, and with ample energy to enjoy leisure-time pursuits and respond to emergencies. This definition implies that physical fitness is important for everyone irrespective of age, gender, or occupation. The only source where physical fitness can be derived is participation in sport and recreational activities. There are health related components of physical fitness and they include; cardiovascular endurance, skeletal muscle endurance, skeletal muscle strength, flexibility and body composition. These are required for good health and well-being and helps to underpin working capability of individuals irrespective of age, sex, stature, socio-economic status, occupation, culture, religion or race. Possessing good health-related fitness is related to lower risk of illness and improved quality of life.

Conclusion

It is important that before one begins to exercise, one should obtain the advice of an expert. It has been noted that too much of exercise is bad for the health. In order to be safe, moderation is required when setting out to begin to practice exercise training for one's health. Ancient medical practitioners understood the relationship between exercise and healthy living. They recommend exercise for the treatment of certain diseases. While some modern research may tend to discard information about antiquity, the modern scholar could scrutinize such information as they may present leads to new discovery that would be beneficial to humanity. While ancient medical practitioners who prescribed exercise as medicine may have not been propagandizing exercise as medicine, however, it seems to be the recent trends in treatments of diseases. Recently, the pictures and videos of Jared Wells a twenty-two-year-old man suffering from cystic fibrosis or lung cancer has gone viral. The reason is that from the lean and seemingly defeated body by the disease, the picture of a body that has been physically built up through exercise, meets the eyes. Jared Wells enrolled in a gym where he spent hours exercising. After eight months, he entered for a body building competition where he placed fourth. The exercise did attenuate the risk of that disease, cystic fibrosis. Jared Wells is a living proof. The ancients were well aware of the benefits of exercise and utilized it. Today, we are drawing from the teachings and experiences of the ancients. Further studies may examine other methods employed by ancient medical practitioners in treating diseases.

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