Physical and cognitive development in old age research paper example

War, Intelligence

Introduction

As people grow older there are certain biological and cognitive changes that take place in the body. The human body experiences decreased capabilities in its respiratory, cardiovascular, digestive, neural and urinary functions. Due to the adverse challenges that the elderly face in their later life, it would be great for the various scientists and experts to come together and research more on the theories of aging or the causes of aging. They can come up with more treatments that will increase the immunity system of the old people. This way the older people are able to live their last years on earth facing lesser risks in contracting diseases such as cancer, congestive heart failure and other adverse conditions.

Theories of Aging

There are different theories that have been put forward to explain what causes the physiological or biological changes in late adulthood. There is the cellular clock theory that was given by the Leonard Hayflick in the year 1977. He explained that the human cells are capable of dividing up to seventy or eighty times however as someone advances in years the cells lose some of their ability to divide themselves. In a research study that he conducted he found that in the older generation, the cells were dividing less than the usual eighty or seventy five times. Due to the reduced ability, he forecasted that the potential human being’s lifespan was up to the years of 120 or 125. Scientists have now explained that every human being has a time limit which has come to be known as the Hayflick time limit. Hayflick did not give the

explanation as to why the cells were unable to divide themselves at the same capacity.

Scientists in the recent years have been able to explain that the reduction in the capability to subdivide is caused by the tips of the chromosomes. There are telomeres which are DNA sequences that cap the body chromosomes. As the cells subdivide, it has been observed that the telomeres become shorter and shorter. After 70 or 80 times of subdivision, the telomeres are greatly reduced such that there is no longer any subdivision (Shay & Wright, 1999, p. 150).

The second biological theory of aging is known as the free radical theory. As the people become older, in their processes of normal metabolism there is the increased production of unstable oxygen molecules known as free radicles. As these unstable molecules move within the body they cause certain disorders such as cancer and arthritis. In a research study that was conducted on obese individuals, it was noted that overeating increases the amount of free radicals in the body. If the individuals were put on a program where they have to reduce the in calorie consumption, the damage caused by the radicals was greatly reduced.

The free radical theory was proposed in 1956 by Denman Harman. He had noted certain similar relationships or parallels between the ionizing radiation that includes cancer, mutagenesis and cellular damage and the effects of aging. At first the theory did not gain much support among the scientists however in the year 1969, there was the discovery of SOD, superoxide

dismutase, and the theory started to gain credibility (Beckman & Ames, 1998). This is an enzyme that reduces or degrades the superoxide radical cells. It was noted that when certain organisms were injected with externally produced antioxidants their lifespans increased.

There is also the mitochondrial theory of aging. Denman Harman, an expert who had introduced the free radical theory of aging also came up with the mitochondrial theory of aging. The mitochondria in the body are cells whose purpose is to provide energy in the body. In aging, the mitochondria in the body start to decay affecting their ability to provide the cells in the body with energy. The individual gets highly affected by the decreased capabilities of the cells to perform their functions. The mitochondria start to decay or mutate due to oxidative stress. They are exposed to the electric transfer chain cycle and the oxygen that is released in the process. This theory of aging is actually a refinement or advancement of the free radical theory of aging. When the cells are inactive and inefficient there is increased production of the reactive oxygen species which in turns leads to the decay and mutation of more mitochondrial cells. It is a vicious cycle that leads to oxidative damage, cell dysfunction, aging and death (Alexeyev, Ledoux & Wilson, 2004).

Lastly there is the theory of hormonal stress in aging which states that as the people grow older, there is stress which lowers the body’s resistance and causes it to get diverse diseases as times goes by (Parsons, 2003). There is a hormone known as the cortisol which increases in the body as time goes by. This hormone affects the hypothalamus organ in the brain and causes it to

have reduced capabilities. The hypothalamus in the body plays a vital role since it is responsible for instructing other glands in the body to release their hormones in order to regulate and protect the body.

Cognitive Development

In old age, there is a reduction in the speed of information processing in the elderly. This affects their cognitive or mental processes. The brain does not function as efficiently and the elderly also lose the desire to be more accurate in their mental processes. There are two systems in the human brain that are responsible for helping an individual pay attention to his environment. There is the posterior attention system that is concerned with paying attention to the visual environment. The anterior system assists an individual to direct focus on a particular object where there are many external stimuli. It has been observed that in the elderly people, there is a decreasing function of the anterior attention system.

The elderly therefore show a decline in their capability to focus on a particular object however when it comes to general attention of the environment around them, they capabilities remain constant. There is also the ability of an individual to do parallel processing or to multitask. It has been noted that the elderly can outperform their younger family members when it comes to parallel processing where one of the tasks being performed is automatic. The elderly have been reading for more years, they therefore exhibit higher skills when it comes to word recognition. It is important to note that the superior capabilities exhibited by the elderly are restricted to those processes which they have been performing for a long time and they

have cumulative experiences. The elderly also face great challenges when it comes to their memory. This can be attributed to the fact that their brain is slowly shrinking in size. The elderly usually experience great trouble or difficulties remembering the distant events more than the distance events (Craik, 1994). An elderly person would narrate the prom he attended in high school more accurately than the meal he ate yesterday evening. Most of the elderly people get the Alzheimer’s disease where they can even forget their family members for select periods of time. There are three processes involved in processing memory which the elderly have difficulty with. The elderly experience difficulty in encoding, storing and retrieving information. It gets tougher to retrieve information in their brain or conduct memory searches (Bashore, Ridderinkhof & Van der Molen, 1998). They tend to have so many alternatives and options than the younger generation.

Their intelligence also suffers a decline. Research has shown that the IQ of the elderly decreases over time. Their problem solving capabilities diminish over time (Schaie, 1994). They are those who argue that their intelligence does not diminish so much; rather their observed behaviour is due to their interaction with new and unfamiliar problems. There are scholars who offered an explanation to explain the decrease in intelligence in the elderly which is known as the dual process model. There are two aspects of intelligence known as the mechanics and pragmatic dimension. The mechanics intelligence dimension refers to the fluid intelligence while the pragmatic aspect refers to practical reasoning of the individual. It is noted that the level of mechanics intelligence decreases in old age.

Experts say that this is expected since this is usually the intelligence that an individual received when they were young and they do not need it in old age. However the pragmatic dimension of intelligence remains constant as the elderly really need this type of intelligence. They remain practical which can be likened to being wise in old age. The wisdom enhances their quality of life and social interaction since the younger people desire to interact with them a lot and hear from them. It also assists them practice honesty and integrity. There is also crystallized intelligence which remains stable and constant in old age. This is intelligence that the elderly people have acquired through cumulative education.

Physical Development in Late Adulthood

There are several changes that happen in the body as an individual approaches late adulthood. The organ systems have begun to degenerate impairing physical activities and processes. The systems start to become less efficient in their operations. Older people begin to lose weight drastically due to factors such as lower metabolism, lower appetites and poorer health. There is a reduction in the muscle and tissue muscle. The loss of weight is aggravated more by the compression of the spinal cord and the softening of the tissues. The older people begin to have a stooping posture with their head bent forward.

There are those who experience the total loss of their teeth in the ages of sixty four to seventy four. The risk of dental diseases such as gingivitis and inflammation of the gum tissues is also very high at this age. Some of them neglect to take care of their teeth by getting medical attention either due to

lack of finances or they get dentures that do not fit appropriately. As a result they get malnutrition as they can only consume foods that are easy to chew. This makes them not to be able to consume fruits, vegetables and various kinds of meat.

Their overall movement is also restricted due to deterioration of the vertebrae. They become less restricted in their movement. Some develop osteoporosis which leads to their bones breaking easily (Hinton, Moody & Davis, 2002). They become very stiff losing flexibility in movement due to the loss of elasticity in their bone muscles. Most of them experience a lot of back pain with some of them getting arthritis and rheumatism. Others get muscle cramps and gout, a disease where there is the formation of uric acid crystals in the joints especially in the feet.

The cardiovascular system in late adulthood is not spared either. There is high accumulation of fat in the heart issues which causes hardening of the arteries. There is extra pressure or stress on the heart and a lot of the older people develop high blood pressure and other heart related diseases. The elderly have to be more serious in taking physical exercises as this relieves the situation (Stratton, Levy, Cereueira, Schwartz & Abrass, 1994). The elderly usually get tired easily, they lack the energy that the young people and the middle age exhibit. This is because they have less cardiac activity which decreases or slows down the heart rate. A lot of the elderly people succumb to death due to hear diseases such as heart attack and congestive heart failure. There is a low supply of oxygen to the heart due to the hardening of the arteries and thick heart valves.

There are those who have to deal with serious respiratory diseases such as pneumonia, emphysema and cancer of the lungs. Lung cancer is associated with prolonged incidences of smoking, air pollution and other hazards. The risks in getting the disease increases more with old age. Emphysema causes one to experience great difficulty in breathing. There is also a lot of restriction when it comes to movement. Pneumonia on the hand refers to the inflammation of the lungs.

There are several factors that cause the elderly to be susceptible to the disease. Those ones who have been bedridden for a while get it a lot since the lungs have not been able to clear due to the decreased activity. The elderly also have lower immunity levels, poor circulation and lower lung efficiency causing them to have a high risk than others in contracting pneumonia. Generally, the elder people respiratory system has a lower capacity than normal in inhaling and exhaling air. Their chest muscles and diaphragm tend to weaken and these organs are vital for expansion and contraction. The lungs also become elastic due to a change in the collagen composition.

The digestive disorders also increase more in old age. The elderly find themselves dealing with diseases such as gall bladder conditions, hernia, gastritis and constipation. There is difficulty in bowel movement causing them to get haemorrhoids and constipation. These conditions can be solved by a change in the dietary components where their meals have more fibre than usual. The hiatal hernia is experienced by the elderly who are overweight. This is where a portion of the individual’s stomach slides and

moves next to the oesophagus causing a lot of indigestion, chest pain and difficulty in swallowing.

There are those who also suffer from diverticulitis where a certain part of the intestine becomes inflamed. It causes the individual a lot of pain and nausea. There is also a change in the bowel habits. It can be rectified through surgery where the affected part has not ruptured or perforated. There are also gall bladder conditions where stones are formed from the insoluble substances in the bile. They are very painful and the individual experiences a lot of vomiting and nausea.

There are also complications that arise in the reproductive and urinary system. The kidney is highly affected becoming inefficient where the individual cannot control his bowel movement. It is an embarrassing problem as the individual cannot retain any urine in the urethra, it is involuntarily released. For the men, the prostate gland gets enlarged and they are at a greater risk of getting prostrate and bladder cancer.

The women face even more complications as they usually get cysts and prolapsed uterus. They are also face the greatest risk in contracting breast, vulva and cervix cancer. Breast cancer has been observed to be the leading cause of death in elderly women in the United States.
In the brain, there is slower nerve cell transmission causing the reaction time of the elderly to be very slow. The situation is further aggravated by the slow transmission of oxygen to the brain. There is also a decrease of the nerve and brain cells. This is dangerous where the elderly are involved in activities

such as driving (Owsley & McGwin 1999). The reduced oxygen flow causes disturbances such as insomnia, memory difficulties and irritability. The elderly sleep for very short periods of time. They also get sensory deprivation which has serious implications for their mental abilities.

Their vision gets weaker and it is not acute as it used to be. They are also at risk of getting eye conditions such as glaucoma, cataracts and vitreous humour of the eyeballs. There are those individuals who become completely blind. There is loss in hearing experienced more by the men than the women. The men usually work in places with hazardous noises more than the women. Most men over the age of sixty five usually have experienced different levels of hearing loss. These hearing handicaps make the elderly maintain very little social interaction. The elderly also complain a lot that the food they eat is bland or tasteless. They prefer to use a lot of salt, pepper and other spices to improve its taste. They behave this way since they have also lost a significant level of their taste and smell perception. They have a decreased number of taste buds and their tongue needs a higher level of stimulation. They also have limited nerve fibres in the nose which is dangerous. They are not able to smell burning food or smoke in the house.

Conclusion

The risk of getting certain cancers and disorder increases with old age. There are also changes in the attention span of the elderly. It decreases as time goes by. There are also decreased visual and sensory capabilities. The IQ also reduces. There are several theories that have been proposed to explain the reduced physiological capabilities which have been greatly debated by

scholars over time. These theories need to be further researched and certain treatment solutions obtained that will greatly assist the aged in the society. The aged should be appreciated in the society and their later years should be taken care of.

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