



## Heart's Role in the Human Body: A Literature Review

Sami Ur Rahman and Muhammad Hassan

Department of Computer Science, University of Malakand, Chakdara

*Received: September 1, 2014*

*Accepted: November 13, 2014*

---

### ABSTRACT

Heart in the human body is a muscular organ that pumps blood to the different organs. However, there are some studies that advocate for some additional functionalities of the human heart. Our long term goal is to visualize this extra ordinary role of the human heart through computer technology. In this article we present our initial study about the different views from ancient philosophers to modern scientists that believed heart's role beyond the pumping machine. We believe that this initial study will also be interesting for research community of the social science field.

**KEYWORDS:** Heart, Spiritual heart, Social Relationship, Behavior, Personality

---

### 1. INTRODUCTION

In different cultures in the history, heart has been considered as the basis of sensation, emotions, excitement and intelligence. In modern era heart has been considering as the king of body which supply blood to different organs. Similarly people used to sense the feeling of love and other affecting states in the heart region. However such roles are emphasized by the scientists in the past with the brain in the head. Recent studies (DeBoer, Karemaker, & Strackee, 1987; McCraty, 2002) shows that the heart be in touch with the brain in information processing, emotion, perception and physical condition. In this article we review those viewpoints that advocate heart's role beyond the pumping machine.

**2. Views about heart: From ancient to modern philosophers.** The study of heart has been remained the field of interest for the philosophers and scientists of ancient period as well as scientists and philosophers of medieval and modern age.

**2.1 The views of ancient philosophers about heart.** Heart has been discussed by different ancient philosophers. Here we give a summary of different school of thoughts about the nature of heart.

**2.1.1 Aristotle.** Aristotle was born in 384 BCE. He was known as a philosopher but he was a natural scientist of ancient times and one of the well known biologists of all the times. The most extremely scientific work of Aristotle is related to the field which is now called neuroscience. He thoroughly disagreed with the central role of the brain in consciousness and movement and characterized this role to the heart (Gross, 1995). Before Aristotle, Greek philosophers-scientists views were different about brain. According to Aristotle brain is not a place of sensation, pain, pleasure but it is the region of the heart. Following are some of the argument of Aristotle in favor of heart and against brain for some features. Those features are:

- Heart is considered for sensation because all animals have organs like heart where only vertebrate and cephalopods have brain and yet other animals have sensation.
- Blood originated from the heart which is mandatory for sensation where brain is bloodless lead to without sensation.
- Heart is warm in nature having the characteristic of life and brain is cold nature that tempers the emotion and furiousness of the heart.
- Heart is created first in the body where brain is formed next. Heart stops working last when the body expires.
- Heart connected with all the sensing parts and muscles of the body, through the blood vessels where brain is not connected to sense organs.

---

\* **Corresponding Author:** Sami Ur Rahman, Department of Computer Science, University of Malakand, Chakdara.  
[srahman@umo.edu.pk](mailto:srahman@umo.edu.pk)

- Heart is located at a central place which is a fitting place for their unique functionalities whereas the brain is not so.

Aristotle is contrasting the claims of brain supremacy over heart, that those of Alcmaeon, Hippocrates, Plato and argues that the insufficiency of fleshy tissues around the brain is in order for consciousness but Aristotle provide the reason that the fleshlessness is for cooling purpose of brain and the backside of the head is also fleshless, but it is empty from sensory organs. Heart and brain together form a unit for controlling the body, that is, heart is warm, and brain tempers the heat and incense of heart (Longrigg, 1995).

**2.1.2 Alcmaeon.** He was the first one who considered that brain is the site of sensation, consciousness and cognition (Gross, 2009). His most theories discuss in details about the sense that is particularly on vision. He describes optic nerves that they are located together at the back of the forehead for the reason that both eyes synchronize with each others. He says that the psyche which is soul and mind made from the lightest, rounded and fastest moving atoms. These atoms are spread with other atoms all over the body and there are several that contain in the brain. Similarly, little cruder atoms are founded in the heart that makes it the core of emotions where some cruder atoms are positioned in the liver which is the place of desire, lust and appetite. However, his observation of the brain for the strong and controlling seat was not the same according to the pre-Socratic philosopher and scientists. Blood is the way of thought where the level of intelligence related to the formation of the blood. That is the heart was the vital organ of intelligence and a place of mental disorder (Longrigg, 1995). The idea about the heart related to intelligence and emotion was the same that is in earlier cultures of Egyptian, Babylonian, Mesopotamian and Indian.

**2.1.3 Rabbi Gershon ben Schlomoh.** According to him “The brain and heart share functions so when one is missing, the other alone continues its activities by virtue of their partnership” (Shlomon & Bodenheimer). Both heart and brain are connected with each other for their functionality. They inform each other from their assigned tasks and whenever one of them failed the other continues their working (Longrigg, 1995).

**2.2 Islamic Philosophy (9<sup>th</sup> to 12<sup>th</sup> century AD).** Heart has been mentioned many times in the Holy Quran and Hadeeth for many reasons and purpose in different perspective. The heart is described alive, hardened, dead or diseased (“Holy Quran Al-Baqara,”). The heart is concerned with the sensation, attitudes, acquaintance, ailment, desires, faithfulness, deed and intention. Heart is the center of human maintaining relationship with the God and governs all actions of the body. In Islamic point of view, heart has given such functionality which some of the modern science considered to the brain (Loukas, Saad, Tubbs, & Shoja, 2007). The heart is referred as either in the categories of healthy or disease one, the diseased one is included with worst character such as distrust, hardened, hypocrisy and ignorance. The heart disease grow with the factors such as profanity, denial of reality, divergence, offense, dishonesty, assertiveness, laxity, dread, irritation, envy, and many others. In the Quran verses “There has come to you a direction from your Lord and a healing for the disease in your hearts” ( *Holy Qur’an: Tauba.125*), means that only sound heart will meet with the God. In other verse it is stated that “Beware! There is a piece of flesh in the body, if it remains healthy the whole body becomes healthy, and if it is diseased, the whole body becomes diseased. Beware, it is the heart”(Bukhari, 1996).The heart gets comfort with the remembrance of Allah referred in the Quran” Those who believed, and whose hearts find rest in the remembrance of Allah, verily, in the remembrance of Allah does hearts find rest. And surely, He is worthy of it” [Holy Quran: Ara’d.28]. So practicing of remembering of Allah, which is a cure for all diseases of the body, heart, mind and soul. Here heart is mentioned in the verse instead of brain. The heart which is rusted is purified and is cleaned with the recitation of the Holy Quran. Same point has been mentioned from the Hadeeth reported by Abdullah bin Umar from the Prophet Hazrat Muhammad (S.A.W). “The hearts get rusted as the water rusts the iron. It was asked about the treatment. The Prophet(S.A.W) advised them to have frequent remembrance of death and recitation of the Holy Quran”(Ghauri, 2010).The heart in the human body is so important, but morally it affects the entire way of living, ”Be on your guard. Surely there is a piece of meat in human body, if this is accurate, the whole body is accurate, and if this gets flawed, the whole body follows it. Be on your guard. This is heart.”(Nawawi). Zikir, which is etiological derived from Arabic word, means that the remembrance of Allah. A study has been made that heart rate variability (HRV) is affected with emotion, mind and behavior related to the remembrance of Allah (Zikir) (Senik & Wahab, 2013).The heart is referred in the Holy Quran for understanding of knowledge such as “Do they not then earnestly seek to understand the Quran, or are their hearts locked up by them?” (“Holy Quran: Muhammad,”).Similarly in other verse, the heart is also mentioned

for the functionality as “Nay, it is clear signs in the hearts of those whom the knowledge has reached” (“Holy Quran: Al Ankabut,”). In the Holy Quran, Qalb is mentioned for some functionality related to human beings. The word Qalb means heart which is either spiritual or corporal. From the precious verses of the Holy Quran, the heart is related with cleaning and rusting for good deeds and hypocrisy like qualities respectively. The heart is mentioned in the above verse for understanding if the heart is unlocked for it.

Next we present views about heart from renowned muslim philosopher.

**2.2.1 Abu ‘Ali al-Husayn ibn Sina (980 to 1037).** He was the most significant and influential philosopher in the pre-modern era. He contributed to the field of philosophy, mathematics, astronomy, psychology and logic. He wrote the book *Al-Qanun* which played major role to the area of medicine. He places sensation, movement, and cognition in the brain, in which the controlling role is given to the heart (Tyab, 1986). According to him, “It is a part of a force which occupying the whole body” (Sena, 1929a). Similarly, the heart is placed for the source of starting point of the vital power. In regards to the heart, there is a disagreement among physician and philosopher. According to philosophers, heart is a root of all faculties and gives the nutrition, life, nervousness, and movement to others faculties, where the physicians distribute these faculties among the others members, that is nutrition to the liver, vital power in the heart and mental faculties to the brain (Sena, 1929b). There are mind cells in the liver, stomach and heart which regulate their activities. There is a hierarchy of liver, stomach, heart, physical and intellectual minds which make a kingdom among us. There are different views that the heart is a source of sensation and the soul come through the way of the heart or it is the brain. But the brain, heart, liver and other member have a relation. The basis or starts of all faculty members are traceable to the heart. Ibn Sina assumed the heart is the source of psychic and emotional activities concerning the supply of blood or breath to every part of the body including the brain. This efficiency for its importance to every cell of the members effect the psychic states (Tyab, 1986).

**2.2.2 Abu Hamid al-Ghazali about Heart.** He was born in Khorasan of Iran in 1058 A.D. He was a great muslim intellectual, ruler, general and artist and crossed every hurdle in his effort to bring back serious Islamic scholarship. He is considered to be a renewer of faith and awarded with the honorific title *proof of Islam* (hujjat tul Islam). He was a famous scholastic philosopher and thinker of the middle ages, and is known for his impact on intellectual history. According to him (Ghazali), human beings are honored and distinct due to his knowledge that is put in their heart by the God. In this life, knowledge is man's attractiveness, perfection and glory and afterlife it will be used as equipment for what he has done in this world. This knowledge is related to man's heart, not to other members. It is the heart which is the source of connection with the God and other members of human serving as subordinates, followers and instruments. He also described that heart is the expression of two things, one is that, that it is the flesh, pine like in shape located in the left side of the breast (Ghazali, 2010). It is special soft tissues having a cavity consist of dark-colored blood which is considered as the source and origin of the soul. The second thing designated with heart is something subtle, Godly and spiritual, which is related to corporeal heart. The connection is same with the connection of user with their tools and qualities with qualified. This subtlety is linked with the exact nature of a man. In man the heart point out for the activities like belief, consciousness, spoken to, punishment, blaming and responsibility. It is related with the physical heart, and minds of men mystified from this connection. Ghazali has mentioned that soul associated to the heart as a subtle quality. The basis of the soul is the hole of the physical heart (Alghzali). The soul is reached to every parts of the body through the arteries. The soul spreading in the body, giving out of the lights of life and body parts capabilities resembles with the light from a lamp which is moved around in the core of the house. In which Life is similar to the light that occurring on the walls and the soul is like to the lamp. The dispersion and movement of the soul in the internal body is similar to the displacement of the lamp in the parts of the house. Soul is a subtle vapor makes from the heat of the heart. Sahl Al Tustari compared the heart to a kingdom and the breast to a place (Tustari). According to him, “The heart is the throne and the breast is the seat”. He destined that heart is the kingdom of man for governing all conducts of human.

**Special Qualities of Human Heart.** Special features related to man's heart is *knowledge* and *will*. The Knowledge is about this world, afterlife and of rational truths. Man's heart is specially qualified with the *knowledge* where *will* is not characterized for other animals and even not found in the beginning of the child during his natural creation. But child get into these features after reaching a specific stage of life where aspiration, annoyance and interior and exterior sense exist.

**Inspiration and Intelligence.** The cognitions come to the heart in certain states in different ways. Inspiration as the thing that comes neither in the course of attainment nor with the artifice of evidence where Intelligence eventuates through inferences and reasoning. Inspiration is that, the heart is inclined for the revelation in it of the highest reality where the interposition in the heart for inspiration is lacking due to, defect in the heart, tarnish of sins and rust of the passion, divert from the search of the reality, prejudices and unawareness. These are veiling between the heart and the preserved tablet(Alghzali).According to Ghazali, the word *heartis* either referred to the corporal heart or spiritual heart. The spiritual heart has connection to the physical heart. The heart is related with the Soul that is who we are, spirit that is the tool in which we love Allah, wisdom which is that what we know and heart is a place which we know Allah. Knowledge and intelligence place in the area of the heart. The knowledge either comes to the heart by means of inspiration or inference, simply that it is connected with knowledge, cognition, understanding, memorizing and wisdom. Heart is also affected with satanic temptation or avoiding it to order their servants on the correct way. The temptation can be cut off by exercising of the remembrance of the God. With the defect in it make interposing between heart and God. Heart has two way of communication; that when man's body is not in sleeping which issued command to their external soldiers, where some time the veils are removed, which covered the eyes of the heart and explore some of what exist in the preserved tablet which some time occurs during sleep and discover what will be happen in the future.

**2.2.3 Harun Yahya.** He was born in Ankara in 1956. He expresses his view about heart, and blood's marvels in his book (Yahya, Jun 2007) that the blood is a medium of communication and as a regulator inside the body. He says that the blood pumping is performed by electricity of the cardiac cells with result of potassium and sodium ions which can easily be found in fluid surrounding of these cells. The atoms consisting of these two elements regularly lose electrons having negative charge. As a result of losing electron, this makes the atoms with extra proton or a positive charge. A continuous positive charge builds surrounding the cell. When it reaches a specific level, the streaming abruptly reverses and sodium ions restart entering into the cells. These abrupt changes make an electrical current and result the contraction of the heart cell. The beating procedure appears from these chemical changes. He says that a small knot of cells called sinus or SA located in the right atrium, produce electrical current of their own, which then transmitted to the impulse to all other heart's lower region, and it regulate these electrical signals. When two cells put together with different beating rate, they immediately harmonize their rhythm through an extraordinary mechanism. There exist a specialized area of tissues between atria and ventricle of the heart known as Atrioventricular node(AV), that carry out the electrical signal from the atria toward the ventricles. It delays the signal before ventricle contract, that the arteries become empty completely. Considering these features, heart is an organ that generates its own signal of electricity and uses it to work in a most coordinated and harmonious way. Heart accurately determines the amount of the current it produces. If immeasurable current passes, it will cause the result in death. Heart contain a unique cells that continuously generate energy, synchronize the blood streaming, extend its size and contracting, maintain their own order of working, act with the plane in intelligence manner, analyze, and perform precautionary measures as required. During sleeping, heart pumps blood that require to alive and when walking the heart rate increases (Yahya, Jun 2007).The human beings performing the action of communication, move about and others using their five senses through the way of electricity produces within their bodies. These actions included cell division and heart beat which perform by using electricity. All organs in the body run on electricity and this energy that allows the heart to beat does not enter from exterior, but it is generated due to the contraction of the heart. It consists of a special creation which works on contraction and expansion by reaching the electrical current. Heart is composed of particular cells that create its own energy. The heart starts beating as an embryo in the womb after a specific duration. It starts functioning even before any nerves of the heart are connected to the brain.The signal that cause the heart to function is started by the cell collection known as the SA node, and get ahead with the help of the artery muscle to the AV node and then to the right and left chamber. This processes are maintain by this special electrical. This function is performed by commanding our Lord, which fulfill a vital task in our bodies. (Yahya, Oct 2007).

**2.2.4 Zakir Naik.** He was born on 18th October, 1965 in India. According to him, The word Qalb in Arabic culture and language means heart as well intelligence, He quotes the verse of Holy Quran with translation that, "As to those who reject Faith it is the same to them whether though warn them or do not warn them; they will not believe. Allah hath set a seal on their hearts and on their hearing and on their eyes is a veil

great is the penalty they incur." [Al-Qur'an 2:6-7]. The Arabic word *Qalb* (heart) used in these Quranic verses means the heart and intelligence. Thus the seal on the heart which referred in the above verses concerned for sealing on the intelligence of the unbelievers and they will not know and unable to distinguish the evil and divine. In the Arabic language heart is also mentioned related to understanding, thoughts, love and emotion. In the Arab, no one were confused about sealing the heart mentioned in the Holy Quran that Allah has sealed the hearts of the unbelievers. They know about the context of the heart which referred for the centre of thought, understanding and emotions (Naik, 2006).

In the Islamic view the Heart is given a central role play to maintain physical and spiritual activities of the body. In the holy Quran, different characteristics like wisdom, intelligence, disease, thinking and many others are related to the heart. This represent that heart has their unique role in the human body except for considering only to a pumping machine.

**2.3 Modern Scientific Views about Heart:** The views of the modern philosophers about the heart's role are divided. Some assigns the central role to the heart while other assigns this role to the brain. In some studies it is argued that many of the functionalities like sensation, emotion, intuition, thinking, information processing and coherence are related to the brain (McCraty, 2002) while other studies argue that the important characteristic like thinking power, processing and many others capabilities are not restricted to brain (Armour, 1994 ; Armour & Kember, 2004). There are views that heart contains neurons which provide the ability for thinking, sensing and maintaining its operations. So heart has not only intracardiac system but also communicates with brain for different activities. The heart generated field of energy is much greater than the brain through which it coherence with internal and external environment (Aszlo, 2008; Morris, 2010). Here we present some of the important thoughts about heart and its extra ordinary role in the human body.

**2.3.1 Heart and Sensation or Emotions.** In the study of the physiological and psychological effect on compassion and anger (Rein, McCraty, & Atkinson, 1995), a connection between heart and emotions has been discussed. It is argued that the changes in emotion are concerned with the changes in heart beating, blood pressure, digestion and respiration. The sympathetic division of the autonomic nervous system and parasympathetic component energizes and cools us down respectively. In this perspective, it was assumed that the autonomic nervous system and the physiological responses moved together in coherence with the brain's reaction to a given motivation. With every heart beat the heart send to the brain and all over the body a complex patterns of neurological, pressure, hormonal and electromagnetic information, which developed a major part of the physiological setting that eventually determines our emotional experience(Rein, et al., 1995).

**2.3.2 Magnetic Field of the Heart.** In the study of Rollin McCraty(McCraty, Atkinson, Tiller, Rein, & Wtkins, 1995), it is discussed that emotional states are connected with the heart. Heart generates electromagnetic field which is most powerful and extensive than the magnetic field produced by the brain (McCraty, Bradley, & Tomasino, 2004). It also expands in all direction into the space surrounding the body which can be detected nearby to the individual. Using these magnetic fields, heart communicates with the body organs. The heart's magnetic field is 5000 times stronger than that of the brain magnetic field (McCraty & Tomasino, 2004). The heart field which can be detected like ECG is about 60 times greater in amplitude than the field produced by the brain, spread in each cell of the body. The heart field acts as a carrier wave for information that synchronizes the entire body(McCraty & Tomasino, 2004). Heart generate strongest magnetic field which influence with body inner emotional states (McCraty, Atkinson, Tomasino, & Tiller, 1998).

**2.3.3 Interactions of Heart.** In the study of Atkinson, Tomasino (McCraty, Atkinson, Tomasino, & Bradley, 2009), individual interaction using heart and brain field is discussed and it is argued that the heart of one person synchronizes with the brain of other using heart-brain magnetic fields. In this study it is argued that electromagnetic waves generated by one person during its conversation with the other, influences his/her brain rhythm. Magnetic field causes an attraction or repulsion between individuals with the contribution of energetic interaction and also affects social relationships. This energetic communication through heart field facilitates realization of relation related to our social world (McCraty & Tomasino, 2004).

**2.3.4 Intuition.** Heart's field is directly involved in intuitive awareness, through its combination to an energetic information field (Bradley, 2006). The facts show that the heart and brain take in and react to

information about events. The heart gets information concerning the future exciting incentive. The interesting phenomenon is that, the heart appears to obtain intuitive information earlier than the brain.

**2.3.5 Heart and Brain.** From scientific research (Salem, 2007), it is shown that the consciousness in fact comes from the brain, but from evidence that the heart acts a particular role in this procedure. Heart and brain communicate in a manner that considerably affects how we pick out and respond to the world. Heart is a sensory organ and refined center place for getting and processing information (McCraty, 2002). The heart has its own unusual logic that repeatedly diverged from the way of the autonomic nervous system. Heart sending messages to the brain for understanding and obeying. Neurophysiologists has discovered a neural pathway and method that heart input signal for the brain assist in its electrical activity (McCraty, 2009).

**2.3.6 Brain in the Heart.** The idea of “heart brain” has been introduced by Armour (Armour, 1994 ). According to this study, heart structure consist of a complex intrinsic nervous system which are suitably sophisticated to meet the criteria as a “littler brain” in its own way (Armour & Kember, 2004). It was first described by Dr. J. Andrew Armour in 1991 (Armour, 1994 ). Heart contains about 40,000 neurons that create its compound circuitry that enables it for the functionality of sensing, regulating and remembering (Armour). Heart brain can process information and make decisions. The heart brain judge hormonal, heartbeat and blood pressure signal, perform translation into neurological signals, and process this information. The information is send to the central brain using different pathways in the parasympathetic nerves and spinal column. The neurological signal generated from the heart is of concerned and extensive affect on continuing the functioning of organs like respiratory, urinary bladder, digestive track, spleen, lymph system and skeletal muscles. These cardiovascular signals regulate efferent automatic nervous system, modulate pain perception and hormone production, and spinal cord excitability changes directly with the cardiac signal, as does physiological vibration of normal skeletal structure (Foster & Stone, 1976). The heart intrinsic nervous system, functions in its new host in the mean time during its transplantaion (Murphy, et al., 2000).

**2.3.7 Heart’s Communication:** Heart also communicates with the brain and body by secret hormones and neurotransmitters which have great influence on the body (Cantin & Genest, 1985). Heart was considered as a part of hormonal system in 1983, with secreted hormones by atria of the heart playing an important role. The heart makes its effects on the kidneys, blood vessels, adrenal gland and several of the regulatory regions in the brain. Research shows that atrial peptide posses the release of stress hormones (Strohle, Kellner, Holsboer, & Wiedemann, 1998), reduces sympathetic outflow (Butler, Senn, & Floras, 1994), perform as a part in hormonal pathways which excite the speed of reproductive organs, interact with immune system, motivation and behavior. The heart contains an intrinsic cardiac adrenergic cell which synthesize and release catecholamine, neurotransmitters once considered being produced only by neurons in the brain. Recent research (Gutkowska, Jankowski, Daher, & McCann, 2000) discovers that the heart secretes oxytocin which is known as love and social hormones. These hormones also concerned in cognition, trust, tolerance, complex sexual and maternal behaviors, social indication and enduring pair bonds. The oxytocin produced in the heart are in the same range of amount as those produced in the brain. Most hormones releases by the heart which tracks the heart rhythm.

**2.3.8 Psycho Physiological Coherence (McCraty, 2010).** From the studies of Rollin McCraty (Tiller, McCraty, & Atikson, 1996), it indicates that when heart regular beats are coherent, the neural information communicates with the brain helping in mental and cognitive function. This concerned for decision making, mental clarity, creativity and inspiration. Heart coherent beating tends to facilitate the positive feeling. The production of the coherent manner possibly direct the changes in the brain’s information processing proficiency that improving performance in task such as focus, concentration and intolerance. The heart rhythm coherence significantly influences physiological, mind, health and spiritual perception (Edwards, 2013). Heart is the spiritual entry, source of intelligence, love, compassion and a sensory processing organ which making independent decision (Childre & McCraty, 2001). The heart is sending information to the brain which not only affect autonomic regulatory center but perception and emotional processing involving in the brain center (Frynsinger & Harper, 1990). The increase of psychological and physiological coherence will increase the harmony, synchronization, creativity and intuition which play an important role in the heart brain interaction (Tomasino, 2007).

**2.3.9 Intracardiac nervous system.** The heart has a complex nervous system making a network for interaction among their different modules. These intracardiac neurons that are sympathetic and parasympathetic regulate heart activities (Kukanova & Mravec, 2006). These neurons located in the heart ganglia. The intracardiac ganglia jointly with each individual ganglia form a complex network referred to the *heart brain* which modulate its activities (Armour, 1999). Neuron in the heart ganglia process information from heart and central nerve system and use for regulation of heart actions. Atria and ventricle are different in autonomous innervations cause modulation of heart activities. Different type of neuron including postganglionic neuron, local sensory neuron and interneuron use for synthesizing for neurotransmitters where some of them contain enzymes for biosynthesis of monoamines. Heart modulated environment monitor by intracardiac nervous system without influencing the extracardiac neuron (Armour & Kember, 2004; Slavikova, Kuncova, Rreishing, & Dvorkova, 2003). Intrinsic cardiac system maintains heart pumping when central nerve system stops working. The central rhythm-genesis interacts with the pacemaker structure to control heart pumping under neural command. The heart rhythmic generator work of their own when the central nervous system signals bring to a halt during heart transplantation.

**2.3.10 Heart Coherence and Synchronization:** Heart rate variability coherence (HRVC) is about the neurocardiac activities of heart-brain interaction and autonomous nervous system. The hearts of people in a group are synchronizing with each other through communication of energetic pathway in heart rate variability coherence (McCraty, Atkinson, & Bradley, 2004). This HRVC synchronizes in the resonance frequency of the hearts of individuals in a group for a collective coherence without spoken word. The heart rhythm coherence has found among the participant of a group with generating an energy field (Morris, 2010). The HRVC of different peoples in *felt towards, comfort ability, friendliness and sense of coherence* (SOC) are about the same for those who feel comfortable with them. The peoples in social groups are synchronizes with the heart rate, coherency and rhythm. Participant in a group for sending and receiving to each others with same level of heart rate variability coherence. Different emotional, mental, entrainment and internal coherence states influence by the heart rate variability (HRV)(Tiller, et al., 1996). The heart rate variability (HRV) performs the shifting emotional state and positive emotion which is helpful in the handling of hypertension (McCraty, et al., 1995). The whole human body show coherency in social interaction, global affairs, efficient energy utilization, consistency, correlation, oscillation and synchronization. Our whole body is not only coherent globally with the external world but ourselves is coherent by whole (Ratey, 2001). The heart rhythm is coherent with the brain in their activities and show high heart-brain synchronization (McCraty, et al., 2009). Coherence increase with positive emotion, compassion, love and care which related to human energetic system which cannot directly be touched. Coherence is related to the self management of energy resources in the domain of physical, emotional, mental and spiritual (McCraty, 2010). Heart play an important role in the body synchronization with brain and other organs through different neurologically (Autonomic Nerve System), biochemically (hormones), biophysically (physical way like pressure and sound) and energetically (electromagnetic field). Heart sends signals to the brain through different pathways for coordination which is greater than the other (DeBoer, Karemaker, & Strackee, 1987). The heart neural system detects hormones, encoding and processing of information and generating neurotransmitters (Armour & Kember, 2004). The heart rate variability use heart rhythm coherence to strengthen the physiological coherence form which affect the heart brain interaction and autonomic nervous system (McCraty & Tomasino, 2004). Similarly the heart rate coherence also has influence on the personality, traits, mental and social aspects(Zohar, Cloninger, & McCraty, 2013). Heart rate variability also affects the interaction of heart-brain and autonomous nerve system in emotion (McCraty, Atkinson, & Tiller, 1993).

**2.3.11 Heart and Exchange of Energy:** As previously shown (McCraty & Tomasino, 2004), that heart generate magnetic field which can be detected some feet away in the surrounding. The electromagnetic energy generated by the heart of one person can be influenced into the magnetic field of the other person (McCraty, et al., 1998). This field becomes coherent when the shifting is performed in a state of love and care and this lead to the exchange of energy between individuals. This energy can be exchanged with the touch and registering the cardiac signals of the participants (Russek & Schwartz, 1994). The cardiac energy created with the touch is a means of communication and facilitate in interaction (Barnett, 1972).

Modern thoughts explores the importance of heart other than supply of blood to the body. From this view it represents that many functionalities like sensation, desire, conscious, emotional, decision making and

information processing are related to the heart completely or partially. Heart performs the arousing and cooling down of body by activating sympathetic and parasympathetic component. Heart generates electromagnetic field all around for social activities, that is, this field synchronizing with the brain generated field. Heart consisting of neurons that are considered for thinking, sensation and remembering. There is a biochemical communication is perform between heart and brain for synchronizing about body activities. With the coherent rhythm pattern, heart helping brain for operation like decision making, stimulation and psychological clarity. The neurological signal generated by the heart affect the functionality of the brain part known amygdala. Heart controls the bodily, emotional and physiological action. During heart transplantation, the rhythmic generator continues their activities with disconnecting from the central neural system. The intracardiac system made from the heart neural system forming a complex network of heart-brain to modulate its activities. In a society the hearts of the peoples in a group are synchronize and coherence in response to heart rate variability. The energy generation of the heart of one person is also effect the other heart energy and influences the communication.

**3. Conclusion:** In the ancient philosophy, medieval research work and modern scientific study, heart has been considered for its special role in the body. According to the philosophers, scientists, poets, religious thoughts and recent research study shows that the heart has a central role rather than the brain completely. In the Islamic philosophy and religious point of view the heart is the place for feeling, desire, sensation, deeds and intentions. According to modern scientific view the heart performs very special tasks like communication with the body organs. It generate electromagnetic field which is much stronger and can be detected few feet away from body. Heart synchronizes with the brain and other body part using neurons, hormones, physical ways and electromagnetic field. The heart generated field is greater than brain field which is also so effective in social activities. The heart field of one person can synchronize with electric field of the other person field which enabled them to communicate without in touch. Heart has an intracardiac system for information processing and communicating referred to functional brain. The heart neurological signals affect amygdala which is the central part of the brain. The hearts-coherency enables heart to regulate their functionalities and help the brain in cognition, creativity and inspirations. The electromagnetic field generated by the heart and brain of peoples cause an exchange of energy. Similarly the people with the same sense of thoughts and coherence have also the same heart rate variability coherence. The heart is not only a muscular pump but also perform such working which affects the physical and mental health of human body. The heart performs these tasks of their own and if necessary then communicates with the brain via sending messages. This information should be obeyed by the brain for the concerned job. Heart also involved an intuition, which predict about the future occurring without in the bound of space and time.

#### REFERENCES

- [1] Alghzali, I. A. *Marvels of the Heart Ihya ul Uloom ud Deen* (1 ed., Vol. 3, pp. 17-40): Shakeel Printing Press.
- [2] Armour, A. *The Science Behind the emWave and Inner Balance Technologies*. Retrieved from [www.heartmath.com/personal-use/emwave-science-behind.html](http://www.heartmath.com/personal-use/emwave-science-behind.html)
- [3] Armour, A. J. (1994 ). *Neurocardiology-Anatomical and Functionla Principles*. Retrieved from [www.store.heartmath.org/e-books/neurocardiology](http://www.store.heartmath.org/e-books/neurocardiology)
- [4] Armour, J. A. (1999). Myocardial ischemia and the cardiac nervous system. *Oxford journals*, 41, 41-54.
- [5] Armour, J. A. , & Kember, G. C. (2004). *Cardiac Sensory Neurons In Basic and Clinical Neurocardiology* (pp. 79-117): Oxford University Press USA.
- [6] Aszlo, E. (2008). Quantum Shift in the Global Brain: How the New Scientific Reality Can Change Us and Our World. *Inner Tradition.Bear and Co*, 49-104.
- [7] Barnett, K. A. (1972). Theoretical construct of the concepts of touch as they relate to nursing. *Nursing Research. Official Journal of the Eastern Nursing Society*, 21, 102-111.
- [8] Bradley, R . T. (2006, 2006). *The Psychobiology of Enter personal Intuition: A Quantum-Holographic Theory*. Paper presented at the *Third AGSE International Entrepreneurship Research Exchange*, New Zealand.



- [9] Bukhari, M. A. (1996). Belief (M. Muhsin, Trans.) *Sahih Al Bukhari* (1 ed., Vol. 9): Alexandria: Al-Saadawi Publications.
- [10] Butler, G.C., Senn, B.L., & Floras, J.S. (1994). Influence Of Atrial Natriuretic Factor On Heart Rate Variability In Normal Men. *American Journal of Physiology*, 267(2), 500-505.
- [11] Cantin, M., & Genest, J. (1985). The Heart And The Atrial Natriuretic Factor. *Endocrine Reviews*, 6(2), 107-136.
- [12] Childre, D., & McCraty, R. (2001). Physiological Correlates of Spiritual Experiences, *The Association for Applied Psychology and Biofeedback* (Vol. 29, pp. 13-17).
- [13] DeBoer, R. W., Karemaker, J. M., & Strackee, J. (1987). *Hemodynamic fluctuations and baroreflex sensitivity in humans: A beat-to-beat model*. Paper presented at the Modeling and Methodology Forum. Retrieved 12 Aug 2013,
- [14] Edwards, S. D. (2013). Evaluation of Heart Rhythm Coherence Feedback Training on Physiological and Psychological Variables. *South African Journal of Psychology*, 20, 1-10.
- [15] Foster, A., & Stone, T.W. (1976). Evidence For A Cardiovascular Modulation Of Central Neuronal Activity In Man. *Experimental Neurology*, 1, 141-150.
- [16] Frysinger, R. C. , & Harper, R. C. (1990). Cardiac and respiratory correlations with unit discharge in epileptic human temporal lobe. *Epilepsia*, 31(2), 162-171
- [17] Ghauri, M.T. (2010). Purification of Soul in Islamic Perspective: A Comparative Study of Islamic Concept of Tazkiah with Monasticism (Vol. 4, pp. 301-326).
- [18] Ghazali, I. *Kitab Sharh Aja ib Al-Qalb* (N. Wajdi, Trans. Vol. 3): Dar ul Ishaat Karachi.
- [19] Ghazali, I. (2010). *Ihya ullum al din*. In I. Muhammad, Hozien & J. T. Valerie (Eds.), *The Revival of Religious Science* (Vol. 3, Available from [www.fonsvitea.com](http://www.fonsvitea.com)
- [20] Gross, C. G. (1995). Aristotle on the Brain. *The Neuroscientist*, 1, 245-249.
- [21] Gross, C. G. (2009). *A Hole in the Head: More Tales in the History of Neuroscience* (pp. 25-47). London England: The MIT Press Cambridge Massachusetts.
- [22] Gutkowska, Jankowski, M., Daher, M., & McCann, S. M. (2000). Oxytocin is A Cardiovascular Hormone. *Brazilian Journal of Medical and Biological Research*, 33(6), 625-633.
- [23] *Holy Qur'an: Tauba.125* (. (A.Haleem, Trans.).
- [24] . Holy Quran Al-Baqara *Holy Quraan* (Vol. 1).
- [25] . Holy Quran: Al Ankabut.
- [26] . Holy Quran: Muhammad.
- [27] Kukanova, B., & Mravec, B. (2006). Complex Intracardiac Nerves System. *Bartislava Medical Journal*, 3, 7.
- [28] Longrigg, J. (1995). Greek Rational Medicine: Philosophy and Medicine from Alcmaeon to the Alexandrians. *Electronic Antiquity*, 3(1), 9-21.
- [29] Loukas, M., Saad, Y., Tubbs, R.S., & Shoja, M.M. (2007). The Heart And Cardiovascular System In The Qur'an And Hadeeth. *International Journal of Cardiology*, 1-5.
- [30] McCraty, R. , Atkinson, M., Tomasino, D., & Tiller, A. W. (1998). The Electricity of Touch: Detection And Measurement of Cardiac Energy Exchange Between People. In K.H. Pribram (Ed.) (pp. 359-379): Lawrence Erlbaum Associates.
- [31] McCraty, R. , Bradley, R. T., & Tomasino, D. (2004). The Resonant Heart. *The Frontiers of Consciousness*, 5, 15-19.
- [32] McCraty, R. (2009). The Coherent Heart-Brain Interactions, Psycho physiological Coherence, and the Emergence of System-Wide Order. *A Transdisciplinary & Transcultural Journal*, 5, 43-99.
- [33] McCraty, R. (2010). Coherence: Bridging Personal, Social and Global Health. *A Transdisciplinary & Transcultural Journal*, 16, 10-25.
- [34] McCraty, R. (2002). The Scientific Role of the Heart in Learning and Performance Retrieved 22 Aug 2013, 12-oct-2013, from [www.heartmath.org](http://www.heartmath.org)
- [35] McCraty, R. , Atkinson, M., & Tiller, W. A. (1993). New Electrophysiological Correlates Associated with Intentional Heart Focus. *Subtle Energies and Medicine Journal Archives*, 3, 18.
- [36] McCraty, R. , Atkinson, M., Tomasino, D., & Bradley, R. T. (2009). The coherent heart: heart-brain interactions, psychophysiological coherence, and the emergence of system-wide order. *Integ Rev: A Transdisciplinary and Transdisciplinary Journal for New Thought, Research and Praxis*, 5, 110-115.

- [37] McCraty, R., Atkinson, M., & Bradley, R. T. (2004). Electrophysiological evidence of intuition: Part 1. The surprising role of the heart. *The journal of alternative and complementary medicine*, 10, 133-142.
- [38] McCraty, R., Atkinson, M., Tiller, W., Rein, G., & Watkins, A. D. (1995). The Effects of Emotion on Short-Term Power Spectrum Analysis of Heart Rate Variability. *The American Journal of Cardiology*, 76(14), 1089-1093.
- [39] McCraty, R., & Tomasino, D. (2004). *Heart Rhythm Coherence Feedback: A new Tool for Stress Reduction, Rehabilitation and Performance Enhancement*. Paper presented at the Proceeding of the First Baltic Forum on Neuronal Regulation and Biofeedback.
- [40] Morris, S. M. (2010). Archiving Collective Coherence: Group Effect on the Heart Rate Variability Coherence and Heart Rhythm Synchronization. *Alternative therapies in Health and Medicine*, 16(4), 62-72.
- [41] Murphy, D. A., Thompson, G. W., Ardell, J. L., McCraty, R., Stevenson, R. S., Sangalang, V. E., et al. (2000). The Heart Reinnervates After Transplantation. *Annals of Thoracic Surgery. American Journal of Psychotherapy*, 69(6), 1769-1781.
- [42] Naik, Z. (2006). Heart and Intellect Retrieved 12 Jan 2014, 2014, from www.studying-islam.org
- [43] Nawawi, A. The Beginning of the Revelation *Saheeh-ul-Bukhari* (Vol. 1).
- [44] Ramey, J. J. (2001). *A User's Guide to the Brain: Perception, Attention, and the Four Theaters of the Brain*: Pantheon Books New York.
- [45] Rein, G., McCraty, R., & Atkinson, M. (1995). The Physiological And Psychological Effects Of Compassion And Anger. *Journal of Advancement in Medicine*, 8, 87-104.
- [46] Russek, L., & Schwartz, G. (1994). Interpersonal Heart-Brain Registration and the Perception of Parental Love. *Subtle Energies and Energy Medicine Journal Archives*, 5, 208.
- [47] Salem, M. O. (2007). The Heart, Mind and Spirit *The Arab Journal of Psychiatry*, 20, 161-167.
- [48] Sena, I. (1929a). *Al-Qamun Fi Al-Tibb* (1 ed.). New York: New York America: AMS Press.
- [49] Sena, I. (1929b). *Al Qanoon Fil Tib* (G. O. Cameron, Trans. 1 ed.). New York: New York America: AMS Press.
- [50] Senik, M. R., & Wahab, M. N. A. (2013, April 2013). *A Pilot Study of The Effect of Zikir on The Performance Psychology Using Heart Rate Variability*. Paper presented at the 4th International Graduate Conference on Engineering, Science and Humanities, University of Teknologi Malaysia, Malaysia.
- [51] Shlomon, R. G. B., & Bodenheimer, F. S. The Gate of heaven. *Chicago Journal* 45, 113-115.
- [52] Slavikova, J., Kuncova, J., Rreishing, J., & Dvorkova, M. (2003). Catecholaminergic neurons in the rat intrinsic cardiac nervous. *Neurochemical Research*, 28, 593-598.
- [53] Strohle, A., Kellner, M., Holsboer, F., & Wiedemann, K. (1998). Atrial Natriuretic Hormone Decreases Endocrine Response To A Combined Dexamethasone Corticotropin Releasing Hormone Test. *Biological Psychiatry*, 43(5), 371-375.
- [54] Tayab, M. (1986). Physical approach of Avicenna toward the science of behavior. *Indian Journal Of History Of Science*, 2, 363-367.
- [55] Tiller, W. A., McCraty, R., & Atikson, M. (1996). Cardiac Coherence: A New, Noninvasive Measure of Autonomic Nervous System Order. *Alternative therapies in Health and Medicine*, 2(1), 52-65.
- [56] Tomasino, D. (2007). The Physiological Basis of Creativity and Intuition: Accessing the "The Zone" of Entrepreneurship. *International Journal of Entrepreneurship and Small Business*, 1, 1-15.
- [57] Tustari, S. A. *The Great Commentaries on the Holy Qur'an Series* (1 ed. Vol. 4).
- [58] Tyab, M. (1986). Physiological approach of ibn sena toward the science of behavior. *Indian journal of history of science*, 2, 363-367.
- [59] Yahya, H. (Oct 2007). *The Miracle of Electricity in the Body* (C. N. Rossini, Trans. 1 ed.): Global Publishing Talatpasa Mah Istanbul Turkey.
- [60] Yahya, H. (Jun 2007). The Miracle of the Blood and Heart. In T. Mossman (Eds.) Available from www.harunyahya.com
- [61] Zohar, A. H., Cloninger, C. R., & McCraty, R. (2013). Personality and Heart Rate Variability: Exploring Pathways from Personality to Cardiac Coherence and Health. [Socail science]. *Open Journal of Social Sciences*, 1, 32-41.