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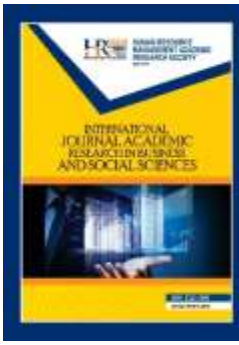
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The Effect of Recitation Quran on the Human Emotions

Eman Ghanem Nayef and Muhammad Nubli Abdul Wahab
Center of Modern Language and Human Science, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Kuantan, Pahang, Malaysia

Abstract
This research presents the works related with the human emotional affected by Quran recitation. Recitation of the Holy Quran is governed by a variety of rules called "Tajweed rules". There are many factors that affect the human emotion like heart rate variability and breathing behaviour, internal and external to the human body. Quran recitation produced a significant relaxation which may be due to that Quran has specific effect on human heart which lead to effect some hormone and chemical are responsible for relaxation.
Keywords: Recitation Quran, Human Emotions, HRV.

Introduction

Islam is the most complete religion, which presents a complete way of living and has the flexibility to respond to new technologies. In Islam, laws of biomedical ethics are linked to the ethical teachings of Holy Quran and Prophet Muhammad (PBUH). (Azarpour, Moraditochaeeb, & Bozorgia, 2014).

The Quran is the word of God revealed to the Prophet Muhammad in plain Arabic language in the span of 23 years. This is the undisputed definition accepted by all Muslims through the history of Islamic thought, regardless of their theological and cultural differences.

The Quran contains literary gems in every Ayah, Passage and Sarah and this is one of its miraculous signs. It surpassed the high level of classical Arabic eloquence and has its own style, unique layout, features and a uniquely powerful message which inspire men to change their whole lifestyle and entirely guide them (Nakhavali & Seyedi, 2013). And as a divine guidance message for humans, involves all material and spiritual angels of life. Holy Quran involves all requirements to guide and educate human in social, individual, moral, legal, worldly and hereafter life (Azarpour et al., 2014).

The Quran is a masterpiece and set its own standards and unique style. It possesses an inimitable and astounding style from the literary perspective. It also addresses all human beings and its clear and comprehensible language makes it attractive to every reader or hearer (Nakhavali & Seyedi, 2013).

The aesthetic characteristics of the Quranic language that affect the daily life of Muslims are mainly related to its verbal recitation and chanting. One of its major aesthetic effects is that generated by its poetic language when recited privately or collectively. That is why the recitation of the Quran is a very important practice in the communal as well as in the individual life. At almost every occasion passages of the Quran are recited: at marriages, funerals and at the inauguration of festivals or celebrations not to mention rituals, regular prayers or other religious occasions

Recitation of the Holy Quran is governed by a variety of rules called "Tajweed rules" (Correct pronunciation of the Holy Quran). Reciting the Holy Quran in the appropriate way is very important for all Muslims and is indispensable in Islamic worshiping such as prayers.

So, teaching how to recite it correctly was transmitted, since its revelation to the prophet (PBUH), orally from teachers to learners throughout generations. Such a method has been considered as the only way to learn it until the twentieth century, where technology produced recording systems and electronic devices that are able to keep both text and sound of the Quran with “Tajweed” rules. Since then, it becomes possible to listening Quran recitations recorded from authentic reciters (Abdullah & Omar, 2011)

Quran the word of Allah, which is light and guidance, and the tranquility of the heart, quality Quran gives human reassurance, comfort, and makes it far from the concerns and anxieties and depression, There is no doubt that prevention and pre-empt the occurrence of disease or aggravation is one of the basics of mental health and psychotherapy at a time Presently, such an approach is found more assertive and integrated, accurate and detailed in a Quran approach to protect the individual from falling into mental illness is not shield them from illness, delinquency, but even just approach him ,God said (the remembrance of Allah do hearts find rest) and zeker will be keeping their prayers on time (and keep up prayer for the remember me) and zeker be by reciting the Quran because the heart that have nothing from Quran is like ruined house (Alsaboney, 2007).

(Abdullah & Omar, 2011) reports that Quran recitation produced a significant relaxation which may be due to that Quran has specific effect on human heart which lead to effect some hormone and chemical are responsible for relaxation (Shekha, Hassan, & Othman, 2013).

There are many factors that affect the heart rate variability and breathing behaviour, internal and external to the human body (Al-Zaben, Hamad, Alfahoum, & Saefan, 2014). Emotions are an unstoppable and uncontrollable aspect of mental state of human. Some bad situations give stress and leads to different sufferings. One can’t avoid situation but can have awareness when body feel stress or any other emotion (Sharma & Kapoor, 2014).

One of the important effects on students’ learning and achievement is emotions, it controls the students’ attention, influence their motivation to learn, modify the choice of learning strategies, and affect their self-regulation of learning. Furthermore, emotions are part of students’ identity, and they affect personality development, psychological health and physical health. From an educational perspective, emotions are important because of their influence on learning and development, but students’ emotional wellbeing should also be regarded as an educational goal that is important in itself. (Pekrun, 2014)

Positive thinking is looking at the bright side of situations, making a person constructive & creative. Positive thinking is related to positive emotions and other constructs such as optimism, hope, joy and well being. Positive thinking is a generic term referring to an overall attitude that

is reflected in thinking, behaviour, feeling and speaking. Positive thinking is a mental attitude that admits into the mind; thoughts, words and images that are conducive to growth, expansion and success (Naseem & Khalid, 2010).

It becomes easy for doctors whose patient is not in condition to speak. In that case person's physiological parameters are measured to decide emotional status. While experiencing different emotion, there are also physiological changes taking place in the human body, like variations in the heart rate (ECG/HRV), skin conductance (GSR), breathing rate (BR), blood volume pulse (BVP), brain waves (EEG), temperature and muscle tension (Sharma & Kapoor, 2014).

Several studies have focused on the effect of the music in emotion and health like the effect of music on health (Safara & Samanesadatsadidpoor, 2014) the effect of music on children emotions and improve their learning (Foran, 2009) music and student performance(Horton, Bustamante, Edmonson, & Slate, 2011) students diagnosed with emotional and behavioral disorders (Detty, 2013) relationship of music with stress test anxiety, and test Grades among high school students (Rastogi & Silver, 2014) effect of music on the stress and anxiety (Gautam, Goswami, Jain, Mondol, & Gandhi, 2015)

Some Researchers study the effects of music on the Human body or human brain, Human brain which is one of the most complex organic systems, involves billons of interacting physiological and chemical process that will give rise to experimentally observed neuroelectrical activity, which is called an electroencephalogram (EEG). Many researchers have investigated the effect of various events to the EEG signals such as meditation and classical music (Bhattacharya & Petsche, 2001; Nakamura, Sadato, Oohashi, Nishina, & Yonekura, 1999). From their analysis result, they claimed that meditation and classical music can help a person to be in relaxing conditions.

Problem Statement

Movement and Stress Management of College Students Stress directly affect health behaviours. Stress occurs when persons view a situation, demand, or challenge as exceeding their available coping resources. College students are vulnerable to several stress factors, including academic and social pressures and a new environment.

The adverse medical consequences of chronic stress and tension are well-known and amply documented, including an increased incidence of many chronic medical illnesses to a more guarded prognosis in those cases which are compounded by ongoing and unrelieved stressful life conditions. Reduction of inner and outer stress is therefore a fundamental and paramount element of basic self-care which not only lessens the unpleasant subjective consequences of neglected or mishandled stress but also improves the basic tone and physiological health of the human organism.

Prayer and a sincere relation between the human and the God console anxious hearts and removes pollutions of the soul. Worship in general and saying prayers and reading the Quran in particular, have many positive effects in education, construction and human guidance. In different studies, it is recommended as solution to reduce tensions and a source for adjustment with problems. It also has an important influence on different aspects of individual and social life of humans (Pashib, Khaqani, Bahrainian, & Abedi, 2014).

Listening to the Holy Quran recitation is highly recognizable Islamic repentance to the Muslim community. Undoubtedly, these beliefs can flourish people's mind and soul. Therefore, this repentance has a miraculous power to reduce anxiety and stress like psychological pessimistic

matters from one's mind. Besides this, listening to the Holy Quran recitation can relieve and calm a disturbed mind. Consequently, this repentance may be used as the therapeutic agents in some cases(Salam, Wahab & Ibrahim, 2013).

It should be mentioned here that the Quran has 10 different modes of recitation. This refers to the placement of diacritical marks on the words and how certain words are pronounced. Some students take this task on and memorize the Quran in all the different modes of recitation, which requires a very careful attention to where the pronunciations are different so they're not confused with each other given how subtle they sometimes can be.

There are a couple of important qualities about the Quran that relates to how it sounds. Verses in the Quran rhyme and change rhythm often, which gives a pleasurable effect to the listener. Furthermore, as one recites, they're supposed to sing it rather than simply read it. In fact, the very practice of Tajweed forces the reciter into a singing tone as they enunciate the words of each verse.

Muslim believes every word in Al-Quran. The Prophet Muhammad peace be upon him (pbuh), for example, himself used and advised his followers to Dua (prayer) in times of stress. Rasulullah SAW was agreed that Surah Al Fatiha as Ruqya as it is a dua to Allah for cure against disease (Hadith Al Bukhari). Whereas, Surah Yassin, the 36th chapter in Holy Quran is also believes by Islam followers as one way of recovering or peaceful during sickness. These two surahs are commonly used by Muslim when they are sick or dying (Bakar, 2014)

Since Muslim believe and practice on reciting al-Quran as a way to alleviate stress and recover from sickness therefore this study was conducted to examine effects of Quran recitation on HRV and Breath Behaviors among the student emotion(Heidari, Shahbazi, & Bahrami, 2014), this study is performed in order to extend the research findings of the effects of religious activities to the University Students by using the effects of reading or listening to Quran recitation on the Heart Rate Variability , Breathing Behaviour and $EtCO_2$. Recitation of the Quran and praying to God to reduce test anxiety. Using the results of this research, we can policy makers and managers in relation to the need to reduce the stress tension on the exam, can be

Quran Recitation and Emotion Effect

This research will present the importance of recitation of Quran on the human emosions, the recitation of Quran in reading and listening term will effect on listener or reader emotion with the theme of recitation like a penalty or punishment, hell or heaven and the type of recitation (Tajweed rules) as slow moderate or fast and the effect of recitation on the heart rate variability and breathing Behaviour.

The first discussion will be a about the impact of the heart rate (HRV) at the recitation of the Quran and especially when the recitation of verses punishment and penalty states of heaven and hell and review previous studies of the effect of Quran recitation on HRV.

The second will discuss the effect of breathing Behaviour and the level of carbon dioxide (ETCO2) during the recitation of the Quran and the impact of recitation on the emotion of the reader, previous literatures about the effect of recitation Quran on breathing and ETCO2 will be also reviewed.

Holy Quran Recitation

The Quran is Allah's speech as revealed to the prophet Muhammad (PBUH) more than fourteen centuries ago, and is purported to contain numerous scientific facts and miracles. While some of these miracles and facts have been verified experimentally, we believe that there is still much more to be discovered. Allah almighty said: "*We will show them Our Signs in the universe, and in their own selves, until it becomes manifest to them that this (Qur'an) is the truth. Is it not sufficient in regard to your Lord that He is a Witness over all things?*"[Quran 41: 53]. (Alshaikhli, Yahya, Pammusu, & Alarabi, 2003)

Skimming the Quran shows that it is full of verses emphasizing on relaxation and the way of achieving tranquillity and is full of stories about people placed in stressful situations the with specific strategies that they have overcome stress. This issue led to world health organization advice to the Islamic countries in the Regional Mental Health Summit held in 1998 in the Eastern Mediterranean region to prepare a booklet containing Quran verses that are related to mental health. Despite the great amount of research on the relationship between religious attitudes and psychological variables, investigation of conducted studies and sources shows that unfortunately very little scientific research is available about the psychological effects of Quran. (Mottaghi, Esmaili & Rohani, 2011)

Like listening to different kinds of music has different kinds of effect on the emotion and mood of the reader or listener (Hu, 2010; McCraty, Choplin, Atkinson & Tomasion, 1998; REA, Macdonald & Carnes, 2010; Saarikallio, 2007; Vella, Irvin, Solle, Berendt, & Ramirez, 1999), Quran also has an effect on the state of mind of the listener.

Loud and fast music can energize a person's mood and light and soft music can help in relaxing and focusing. Music is used in nearly all fitness and spa centers. In the workout area, the music played is fast paced whereas in a spa, it is slow paced (Shaikh, 2009).

Quran gives human reassurance, comfort, and makes it far from the concerns and anxieties and depression, There is no doubt that prevention and pre-empt the occurrence of disease or aggravation is one of the basics of mental health and psychotherapy at a time Presently, such an approach is found more assertive and integrated, accurate and detailed in a Quran approach to protect the individual from falling into mental illness is not shield them from illness, delinquency, but even just approach him ,God said (the remembrance of Allah do hearts find rest) and zeker will be keeping their prayers on time (and keep up prayer for the remember me) and zeker be by reciting the Quran (Alsaboney, 2007).

Spiritually and physically relaxation can be achieved by the recitation of the holy Quran. In this technique of listening, reading and watching the text of the Holy Quran subject can involve the whole body. The entire process will be controlled by the brain, as a result during this practice the whole body will receive relaxation/refreshment, and the exhaustion, boring and tiredness will be finished. This physiological biofeedback manner provides groceries for spirit. Hence this means can be used in hospitals for mentally disturbed and depression affected patients, for relaxation of the soldiers, for refreshing the students, to cool down workers in industries and for the entertainment of passengers in buses and airplanes. (Khan, Ahmad, Alla & Nubli, 2010)

Quran Listens and Read

Listen to the melodious Quran recitation is known to have therapeutic effects, even in individuals who do not understand the meaning of the verses being read; it could function as sound therapy,

Quran recitation is also expected to have a positive impact on speech, learning and interpersonal relationship.(Tumiran et al., 2013)

The Quran has an audible beauty that hearing of it, the listener will feel the hypnotic emotional and beautiful effects of it, even if he doesn't understand its language. The music of Quran is a magic which can change extremely the people hearts and emotions. (Nakhavali & Seyedi, 2013) Sound therapy has been used to address various health problems, especially in relation to depression, pain management, emotional and psychological problems, traumatic brain injury and stroke recovery. Almost every research done by scientists related to sound therapy applied elements of music or instruments to trigger the reactions of subjects being studied. For example, an experiment was done to see the response of the fetus towards music and its impact on the heart rate and fetal movement. Auditory system proves to be responsive and plays a role, starting as young as eight months in the womb. In the Islamic tradition, pregnant mothers are encouraged to read certain Quran chapters (e.g. chapter Maryam and Yusuf) during pregnancy. It can be assumed that the fetus in the womb is being stimulated by the melodious recitation of the Quran verses. In fact, Quran verses describing the creation of man are normally initiated with narration on the ability to listen, prior to narrate on the ability to see and think. (Tumiran et al., 2013)

Many Muslims believe that listening to their holy book Quran, has an effect on their state of mind or mood. Each Surah of Quran emphasizes on a unique topic, warns of wrong doings and provides the correct way of handling a particular situation. A person waiting for a job interview or promotion who often becomes frustrated can listen or read Surahs that may help him feel better. (Shaikh, 2009)

Theme in Quran

The Quran contains literary gems in every Ayah, Passage and Sura and this is one of its miraculous signs. It surpassed the highest level of classical Arabic eloquence and has its own style, unique layout, features and a uniquely powerful message which inspire men to change their whole lifestyle and entirely guide them. The miraculous aspects of the Quran can be: specific word choice, word order, emphasis, sounds and visuals produced within the text. The Quran was sent for a specific goal and reason, so everything within it, including every sound, letters, words, sentence structures, different chapters and sections are selected and put together meaningfully and consciously to convey its regarded meaning and benefit. (Nakhavali & Seyedi, 2013)

Concepts could be classified into two main categories: Concrete concepts (lexical or keyword concepts) and Abstract concepts (general concepts). An example of a concrete concept would be any word type or term that already exists in the text such as: names of persons, names of prophets, names of places or cities …etc. Abstract concepts are more general. They are not usually explicitly mentioned in the text. They represent general themes or features covered by the text. For instance, there are several verses in the Quran that describe the main pillars of Islam. This is an abstract concept and is the most important theme in the Quran, but was never mentioned explicitly in the Quran book (Abbas, 2009).

Reciting Quran (Tajweed)

Recitation of the Holy Quran is governed by a variety of rules called "Tajweed rules" (Correct pronunciation of the Holy Quran). Reciting the Holy Quran in the appropriate way is very important for all Muslims and is indispensable in Islamic worshiping such as prayers.

So, teaching how to recite it correctly was transmitted (Nayef, Yaacob, & Ismail, 2013), since its revelation to the prophet (PBUH), orally from teachers to learners throughout generations. Such a method has been considered as the only way to learn it until the twentieth century, where technology produced recording systems and electronic devices that are able to keep both text and sound of the Quran with "Tajweed" rules. Since then, it becomes possible to listening Quran recitations recorded from authentic reciters (Abdullah & Omar, 2011).

Since rhythmic and pleasant recitation of the Quran is a sweet music and the verbal miracle of the Quran, the Quran recitation and its miraculous teachings can be used as an effective non-medical approach to treat depressed patients. (Pashib et al., 2014)

In Arabic Language all the letters have a distinct sound which has an effect on the meaning of the word. A thick sounding letter or word will have a deep meaning and a lightly pronounced letter or word will carry a light meaning. The usage of sounds in the Qur'an plays a rhetorical role and this holy book has an inimitable symphony through which sounds employed to affect meanings and convey messages. (Nakhavali & Seyedi, 2013)

Since the pleasant rhythm of Quran and its pleasant song is nice as a spiritual music and basically the most glorious miracle of Quran is its harmony with pleasant songs and harmonious vocal music, it influences the whole world when accompanied by a warm, beautiful voice and attractive phonetic songs. One of the most beautiful, attractive and the most natural types of music is the spiritual music of Quran recitation that is emphasized to be recited with a beautiful voice and with the best quality. (Mottaghi et al., 2011)

Emotions Effect

Emotions are an unstoppable and uncontrollable aspect of the mental state of human. Some bad situations give stress and leads to different sufferings. One can't avoid situation, but can have awareness when body feels stress or any other emotion. It becomes easy for doctors whose patient is not in a condition to speak. In that case person's physiological parameters are measured to decide emotional status. While experiencing different emotion, there are also physiological changes taking place in the human body, like variations in the heart rate (ECG/HRV), skin conductance (GSR), breathing rate (BR), blood volume pulse (BVP), brain waves (EEG), temperature and muscle tension(Sharma & Kapoor, 2014).

Movement and Stress Management of College Students Stress directly affect health behaviours. Stress occurs when persons view a situation, demand, or challenge as exceeding their available coping resources. College students are vulnerable to several stress factors, including academic and social pressures and a new environment.

Beautiful voice reciting verses from the Quran as one of the most splendid for the miracle of the Quran is considered. God in verse 28 of Surah Raad says: Those who believe in their heart to God slept mentioned, certainly the remembrance of Allah do hearts be calm. This confirms the fact that only God and God is the hope of calming the heart and increases people's optimism. It is also influenced by the recitation of the Quran; God confirms the reduction of anxiety. Objective and colleagues pray to God and the ways of dealing with test anxiety, effectively deactivated. (Heidari et al., 2014)

(Shaikh, 2009) Found reading and listening to the Quran verses Improve human mood, (Heidari et al., 2014) the results of this research showed that the sound of the Quran before exams can

reduce students' anxiety levels. Quran Player deals that not only caused Relaxation and reduce stress but also take steps to promote familiarity with the Quran.

Relaxation and Quran

Tension or Stress is a common and serious problem in our Global Village. Stress and stress related factors contribute to tension and reduced ability to handle life's everyday challenges. Relaxation is “The return of a system to equilibrium after the displacement from its status and tension is antonym of relaxation which is "The loosening of grip on body in life". (Khan et al., 2010)

The stress of life is unavoidable, but it can usually be managed and shaped to produce the optimum health and happiness for the individual under the existing circumstances. Broadly definable in terms of the classic 'fight or flight reaction,' stressful states in modern man typically arise and are perpetuated in conditions where neither fight nor flight is realistic or acceptable. The result may be a state of chronic and unresolved tension and stress affecting both the physical and emotional well-being of the person. The adverse medical consequences of chronic stress and tension are well-known and amply documented, including an increased incidence of many chronic medical illnesses to a more guarded prognosis in those cases which are compounded by ongoing and unrelieved stressful life conditions. Reduction of inner and outer stress is therefore a fundamental and paramount element of basic self-care which not only lessens the unpleasant subjective consequences of neglected or mishandled stress but also improves the basic tone and physiological health of the human organism.

Study(Mottaghi et al., 2011) found that reading and listening to the Quran verses is a simple, effective, affordable, accessible and most importantly drug free method to reduce stress and anxiety in athletes before competition.

(Alshaikhli et al., 2003) Analysis human brain signal EEG and human heart signal ECG while listening to Quran recitation, and compared it with listening to music. The EEG signal classification result showed that the subjects were more relaxed while listening to Quran recitation. And the ECG signal observation result showed that the signal is smoother while listening to Quran recitation which reflects the calmness of the subjects (Abdullah & Omar, 2011). This study proved that human can feel relax and calm during listening to Quran recitation compared to the rest condition and listening to hard music.

Quran Therapy

In many communities, people in stressful situations deal with stress with the use of prayers and attendance to religious rituals, and scientific evidence had shown its positive effects on mental health Faith and tradition in their positive form create mutual activities and help people achieve their perfection Religious practices and beliefs are associated with all aspects of health and disease; it guides daily living habits and it is a source of support, strength and improvement The spiritual dimension of human existence is one of the four dimensions of a holistic approach, and like biological, psychological and social aspects has its importance. Based on research evidence, attention to the spiritual dimension of care will result in significantly different outcomes of physical, psychological and social diseases. In addition, participation in religious and spiritual rituals is associated with better health outcomes, such as increased life expectancy, reduced cardiovascular disease, and reduction of depression risk, anxiety, substance abuse and suicide,

better ability to adapt and improve the quality of life. (Zeinali, Pour, Fattahi, Kalani & Fattahi, 2014)

(Amirfakhraei & Alinaghizadeh, 2012)results of this study indicate that fasting, even for amusement purposes, enhances individuals' mental health. In addition, people who always or usually pray have higher mental health scores than those who never or rarely pray. (Pashib et al., 2014) findings of this study it is concluded that the Quran recitation and its teachings, as miracles, can influence mental and spiritual feelings of humans. Therefore, it can be used as an effective non-medical approach to treat depressed patients.

As for recitation of the Quran, it is typically done with various tarannum or song/melody. Hence, sound therapy involving listening to melodious Quran recitations could be functioning as an antidote and/or a healer (Tumiran et al., 2013)

Sound therapy has been used to address various health problems(Lippi, Sarsina, & D'Elios, 2010), especially in relation to depression(Erkkilä et al., 2011), pain management (Boyd-Brewer, Chris, McCaffrey, ARNP & ND, 2004), emotional and psychological problems(Kim, Wigram & Gold, 2009)

Relationship between HRV and ETCO2 with Quran Recitation

There are many factors that affect the heart rate variability and breathing behaviour, internal and external to the human body (Al-Zaben et al., 2014). Emotions are an unstoppable and uncontrollable aspect of mental state of human. Some bad situations give stress and leads to different sufferings. One can't avoid situation but can have awareness when body feel stress or any other emotion(Sharma & Kapoor, 2014).

Quran recitation produced a significant relaxation which may be due to that Quran has specific effect on human heart which lead to effect some hormone and chemical are responsible for relaxation(Shekha et al., 2013).

Heart rate variability (HRV), an index of autonomic flexibility, is positively associated with good psychological and physiological functioning. HRV is calculated by R-R wave intervals produced by electrocardiographic data. In healthy individuals, heart rate fluctuates during resting states due to the different frequency characteristics of sympathetic and parasympathetic neural modulations of heart rate. Therefore, HRV is indicative of autonomic balance between sympathetic and parasympathetic activity. Low HRV is associated with a number of psychological disorders characterized by poor emotion regulation and behavioural inflexibility, given that emotional flexibility can be defined by autonomic and behavioural reactivity, it is possible that HRV assesses an individual's emotional flexibility, or how well an individual responds to emotional events and generates contextually dependent emotional responses (Fujimura & Okanoya, 2012).

Heart Rate Variability

Heart rate variability (HRV) is a measure of cardio-pulmonary resonance (Sutarto, Wahab & Zin, 2010). When we inhale, our heart beat increases slightly to assist our heart in pumping oxygenated blood; when we exhale, our heart beat slows slightly to allow carbon dioxide to dilate our blood vessels for more effective distribution. This healthy rise and fall in heart rate is the variability trained in HRV biofeedback. When our heart and breath work efficiently together, the parasympathetic branch of the autonomic nervous system is activated, creating the "relaxation response" and allowing our body to access a restorative and regenerative state.

Autonomic nervous system (ANS) modulation during stress and its effect on health and disease has recently been a topic of much debate. Occupational (work-related) stress decreases heart rate variability (HRV) and is associated with increased risk of chronic disease and impaired cognitive function. Various methods have been explored to manage stress and improve cognitive performance, one of which is HRV biofeedback. This guides the user to breathe at the optimal respiratory frequency to maximally increase their HRV. During HRV biofeedback there is an acute increase in baroreflex gain standard deviation of the normal-to-normal interval (SDNN), total frequency (TF) and low frequency (LF) power in the cardiac spectrogram, indicative of increased vagal modulation of the heart(Prinsloo, Derman, Lambert & Rauch, 2013).

As described, changes in mental or emotional state result in changes to the Autonomic Nervous System (ANS) results, which in turn results in changes to the beat to beat heart rate rhythm. The goal of HRV analysis is thus to work in reverse and investigate a subjects affective state via the ANS by making inferences from a beat to beat time series of the heart rate pattern.

A large number of specialized techniques for the analysis of HRV have been proposed by many researchers all over the world. Russian physiologist, Evgeny Vaschillo, began studying (HRV), the beat-to-beat change in heart rate, as a measure of autonomic function in the early 1980's. Initially, he used BFB to teach Cosmonauts to increase the amplitude of HRV at specific frequencies (Vaschillo & Lehrer, 2006). Vaschillo's experimental paradigm consisted of displaying a computer-produced sinus wave as a pacer and current heart rate on a computer screen, and instructing subjects (e.g. six male Cosmonauts) to replicate pacer oscillation with their own physiological activity (in heart rate). He varied the frequency of the pacer within the very low and low frequency heart bands. Beat-to-beat blood pressure and respiration were measured as well. A transfer function analysis of heart rate, blood pressure, and respiration rate at various frequencies was performed. What Vaschillo found was that subjects typically showed the highest-amplitude of HR oscillation within the low frequency range of ~0.075-0.11 Hz. Measurement of blood pressure variability in these subjects showed that the same frequency and high-amplitude oscillation was imposed on blood pressure, although no direct BFB was provided for this measure. It was also discovered that the highest amplitude blood pressure oscillations generally occurred within the very low frequency range of ~0.02-0.04 Hz. As such, Vaschillo labeled the rates at which individuals produced the highest amplitude of heart rate and blood pressure as an individual resonant frequency. He theorized that because respiration strongly affects HR through respiratory sinus arrhythmia (RSA), HRV BFB training that taught individuals to breathe at their resonant frequency could produce high-amplitude oscillation in functions of the autonomic nervous system (ANS) and would strengthen the body's homeostatic control mechanisms including the baroreflexes (Vaschillo & Lehrer, 2006).

To validate Vaschillo's findings, Alexander Smetankin manufactured a portable HRV BFB device and established a BFB clinic in St. Petersburg, Russia. At this site, Russian children with asthma were taught to breathe at their individual resonant frequency as a method to control asthma. Influenced by this Russian research, Paul Lehrer evaluated this method of BFB in the United States. In a small-randomized controlled trial among asthma patients, (Lehrer et al., 1997) found significantly greater decreases in respiratory resistance among those receiving HRV BFB than other groups. He also reported significant improvements in pulmonary function among 20 clinical cases of pediatric asthma treated with BFB, but no medication (Lehrer, Vaschillo, & Vaschillo, 2000). The report, issued by (Lehrer, Feldman, Giardino, Song, & Schmaling, 2002)

delineated a unique method for carrying out HRV BFB. The manual sets forth a ten-session process for teaching individuals to breathe at a rate that was specifically adapted to the rhythms of his/her own systems to improve the baroreflex (e.g. The negative feedback system in which during inhalation, heart rate increases and blood pressure falls).
This report was thematically linked around the premises that (a) HRV BFB would be useful for treating hypertension, particularly because the problem is related to baroreflex dysfunction, (b) HRV BFB would be useful for tonic hypotension where individuals with low blood pressure are also said to suffer from baroreflex dysfunction, and (c) HRV BFB would be useful as a treatment for patients suffering from various anxiety related disorders. The report included comprehensive descriptions of HRV, a manual for carrying out HRV BFB, and called for an imperative need to conduct more extensive research to determine the effectiveness of the experimental protocol.

Figure 1: Heart Rate Variability

Heart rate variability (Figure 1), the change in the time intervals between adjacent heartbeats, is an emergent property of interdependent regulatory systems that operates on different time scales to adapt to environmental and psychological challenges. (McCraty & Shaffer, 2015)
Lowered HRV can be due to a number of different factors, including age, gender, disease or stress, among many other things. Stress can be induced by many different influences, from internal worries to stress on the body caused by exertion or surgery. Stress acts directly on the autonomic nervous system, when the autonomic nervous system is in balance, HRV tends to be higher, and when it is out of balance, HRV tends to be lower. This makes it a good biomarker for stress (Figure 2).

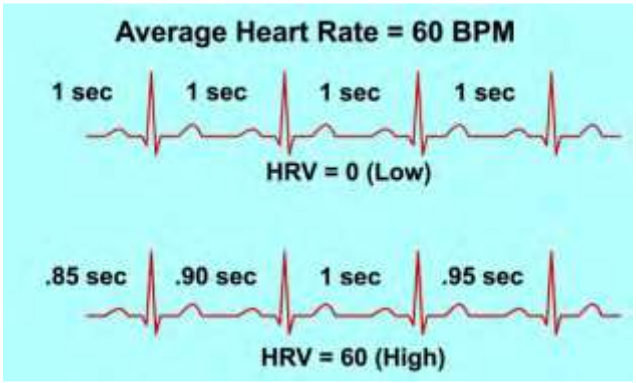

Figure 2: The higher the HRV, the greater your resilience and the lower your stress**.**

Autonomic Nervous System and Heart Rate Variability (ANS/HRV)
The main purpose of the autonomic nervous system (ANS) is to control all human organs and systems to maintain optimum performance or homeostatic function of the organism influenced

by various internal and external factors (Andreassi, 2007). This control is performed by the two branches of the ANS called the sympathetic nervous system and the parasympathetic nervous systems. These systems work together in a complex synergistic ways that can be additive, subtractive, or reciprocal to provide the appropriate internal environment to meet shifts in both internal and external demands (Porges, 1995). The parasympathetic nerves are modulated primarily by internal changes in the viscera. The sympathetic nerves are primarily activated by changes in the external environment via somatic efferent nerve fibers. The parasympathetic maximizes the function of the internal organs associated with growth and restoration. In contrast, the sympathetic promotes increased metabolic output to deal with challenges from the external environment. So, for example, external challenges such as temperature change, noise or pain will produce an attenuated parasympathetic nervous tone and increased sympathetic nerves activity. Because the ANS is an integrated system comprising both peripheral and central neurons, measuring the peripheral visceral activity e.g. the heart, provides a window to the brain structures that regulate visceral function and state (Tiller, McCraty & Atkinson, 1995).

Heart rate variability (HRV) is a very important measure in assessing ANS function. HRV represents the beat to-beat changes in the interbeat interval (time between two successive R-waves). Each R-wave represents a contraction of the heart and corresponds to the pulse as illustrated in Figure 2. The beat-to-beat variability is affected by ANS activity. It is accepted by scientists that the interaction at the heart is a reflection of ANS balance or imbalance in the body in general (BERNTSON et al., 1997). Lehrer suggests that reduced HRV is evidence of vulnerability to physical and psychological stressors, and disease (Karavidas et al., 2007). In contrast, higher HRV has been associated with creativity, psychological resilience, and a more developed capacity to control affective, cognitive, and physiological of stress (Appelhans & Luecken, 2006; Hansen, Johnsen & Thayer, 2003), thus optimum variability is essential.

The normal variability in heart rate is due to the synergistic action of the two branches of the ANS, which operates in balance through neural, mechanical, humeral and other physiological mechanisms to maintain cardiovascular parameters in their optimal ranges and to allow proper responses to changing external or internal conditions (McCraty & Shaffer, 2015). In a healthy individual, thus, the heart rate estimated at any given time reflects the net effect of the parasympathetic (vagus) nerves, which slow heart rate, and the sympathetic nerves accelerate it. These changes are influenced by emotions, thoughts and physical exercise. Changes in heart rhythms affect not only the heart but also the brain's ability to process information, including decision-making, problem-solving and creativity. They also directly affect the emotions. High vagal tone (parasympathetic) is associated with the ability to self-regulate and therefore to have greater behavioral flexibility and adaptability in a changing environment. On the other hand, low vagal tone is associated with poor self-regulation and a lack of behavioral flexibility (Porges, 1995). Thus, the study of HRV is a powerful, objective, and noninvasive tool to measure neurocardiac function that reflects heart–brain interactions and ANS dynamics (Tiller et al., 1995). The analysis of HRV can be used to explore the dynamic interactions between physiological, mental, emotional and behavioral processes (McCraty & Shaffer, 2015).

In general, HRV measures are quantified using time domain or frequency domain measure. SDNN is often used as an estimate of overall HRV which reflects the oscillating influences of the sympathetic and parasympathetic systems on the cardiac or cardiovascular adaptability, while frequency domain analyses HRV have been used to assess autonomic balance. The SDNN is the

standard deviation of the N-to-N interval and is expressed in milliseconds (ms). People with SDNN values below 50 ms are classified as unhealthy, 50-100 ms have compromised health, and above 100 ms are healthy (BERNTSON et al., 1997).

The mathematical transformation (Fast Fourier Transform) of HRV data into power spectral density (PSD) is used to break down and quantify sympathetic and parasympathetic activity and total ANS activity. Power spectral analysis reduces the HRV signal into its constituent frequency components and quantifies the relative power of these components. This allows clinicians or researchers to measure the percentage of this signal within each of three main frequency bands. High frequency (HF) HRV ranges from 0.15–.4 Hz reflects the inhibition and activation of the vagus nerves by breathing at normal rates. Low–frequency (LF) HRV (0.05–0.15 Hz) associates highly with baroreflex gain, and is influenced by both the sympathetic and parasympathetic systems. Very low frequency (VLF) band (0.005-0.05 Hz) represents sympathetic activation or reduced parasympathetic inhibition. Figure 3 shows a power spectrum of the HRV waveform. The power (height of the peak) in each band reflects the activity in the different branches of the nervous system.

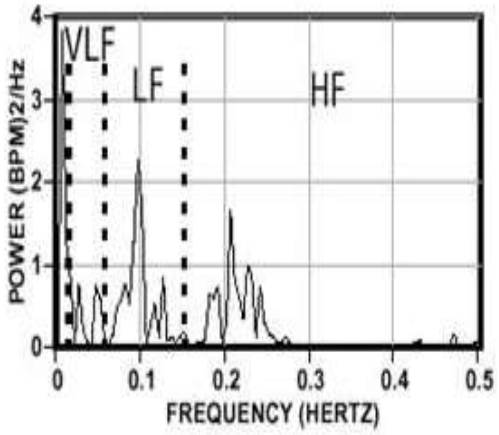

Figure 3: Power spectrum of the HRV waveform. (McCraty & Shaffer, 2015)

It has been shown in a number of studies that during mental or emotional stress, there is an increase in sympathetic activity and a decrease in parasympathetic activity (Duschek & Stefan, 2009). This results in increased strain on the heart as well as on the immune and hormonal systems. Increased sympathetic activity is associated with a lower ventricular fibrillation threshold and an increased risk of fibrillation, in contrast to increased parasympathetic activity, which protects the heart.

Heart Rate Variability and Respiratory Sinus Arrhythmia (HRV/RSA)

Heart rate changes in cycles. These cycles comprise what is known as “heart rate variability,” or HRV. One of these cycles tracks the breathing pattern: breathing in increases heart rate, and breathing out decreases heart rate (also known as the respiratory sinus arrhythmia, or RSA). This pattern of heart rate change (variability) increases in amplitude as one relaxes, decreases in amplitude as one becomes tense, and disappears altogether when one becomes highly anxious, stressed, or fearful. RSA is defined as a change of heart rate associated with respiration such that heart rate increases during inhalation and decreases during exhalation.

There is now ample evidence that heart rate variability is a diagnostic marker of health and adaptability. Correspondingly, there is a rapidly growing literature on the efficacy of heart rate variability/respiratory sinus arrhythmia (HRV/RSA) biofeedback for a variety of conditions. Respiratory sinus arrhythmia is the natural fluctuation of heart rate that is influenced by breathing and the impulses from the baroreceptors. (Muench, 2008)

Heart rate variability (HRV) biofeedback is self regulation strategy used to improve conditions including asthma, stress, hypertension, and chronic obstructive pulmonary disease. Respiratory sinus arrhythmia (RSA) and HRV and HRV biofeedback protocols often include slow abdominal breathing to achieve physiologically optimal patterns of HRV with power spectral distribution concentrated around 0.1 Hz frequency and large amplitude. It is likely that optimal balanced breathing pattern and ability to entrain heart rhythms to breathing reflect physiological efficiency and resilience and that individuals with dysfunctional breathing pattern may have difficulty voluntarily modulating HRV and RSA (Courtney, Cohen & Dixhoorn, 2011).

Breathing Behaviour and $ETCO_2$

Chemistry Respiration is behavioural-physiologic homeostasis, a form of self-regulatory behaviour, which constitutes a transport system for customized delivery of atmospheric oxygen to each and every tissue based on their specific metabolic requirements, including the transport of metabolic carbon dioxide from the cells to outside air. The mechanics of respiration constitute breathing, the use of the lungs for moving oxygen, carbon dioxide, and other gases to and/or from the blood. The chemistry of respiration constitutes the physiology of moving oxygen from the lungs to the cells, and carbon dioxide from the cells to the lungs. Optimizing respiration means good chemistry through good mechanics. Breathing chemistry has reference to the ventilation of carbon dioxide through these breathing mechanics in the service of establishing adaptive respiratory chemistry. Respiratory chemistry can be monitored by measuring changes in exhaled carbon dioxide.

A capnogram consists of 4 phases and plots CO_2 concentration over time. See figure 4 Phase I, respiratory baseline, is shown as A-B. It measures the CO_2-free gas in the deadspace of the conducting airways (so named because they conduct gas to the alveoli where gas exchange can occur). The A-B value is normally zero. Phase II—also known as the expiratory upstroke—is shown as B-C. The rapid rise seen in the capnogram represents mixing of deadspace (CO_2-free) and alveolar air (contains CO_2). The expiratory upstroke should be steep. Phase III, the expiratory plateau, represents exhalation of mostly alveolar gas; this is shown as C-D. Point D is the $EtCO_2$ level at the end of a normal exhaled breath; normally 38 mm Hg or 5%. Finally, the inspiratory downstroke or Phase IV, shown as D-E, reflects the inhalation of CO_2-free gas. The capnogram quickly returns to its baseline. 3, 4 Changes in the capnogram or $EtCO_2$ values reflect changes in metabolism, circulation, ventilation or equipment function.

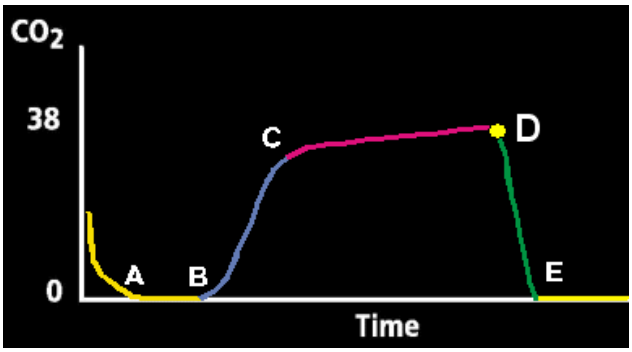

Figure 4: The 4 phases and plots CO2 concentration over time.

Breathing often reflects our state of relaxation or excitation. When at rest, breathing is usually slow and rhythmic, (such as when asleep). When tense, breathing may be erratic, or we may hold our breath. Controlling breathing may help you become aware of your state so you can stay relaxed. Breathing techniques are helpful to many people. The most basic way to practice paced breathing is simply to be aware of the breaths you are taking so that you may then gradually let them become deeper to the point where your lungs are filled to capacity. When you breathe in, your abdomen should expand as well as your chest. Hold the deep breath for a second or two and then let it out slowly. Anxiety disorders are associated with respiratory abnormalities. Breathing training aimed at reversing these abnormalities may also alter the anxiogenic effects of biological challenges. Qigong was considered as a series of health and wellness techniques based on breathing exercises and body positions. For paced breathing of Qigong, a general slow breathing technique is to make one in-and-out breath last one minute. Inhale for 20 seconds, then pause and retain the breath for 20 seconds and finally let the breath out in a long exhalation lasting 20 seconds (Xie et al., 2005). The paced breathing exercise was investigated whether treatment with one of two kinds of breathing training would attenuate the psycho physiological reactions of Panic Disorder patients to hypo- and hyperventilation and conclude that baseline respiratory abnormalities are somewhat specific to Panic Disorder, but that previously reported greater reactivity and slower recovery to respiratory challenges may be absent. (Wollburg, Roth & Kim, 2011).

Paced breathing is a deeper, slower way of breathing. It involves filling the lungs to full capacity when inhaling and then pushing out as much air as possible when exhaling. In addition to getting more oxygen to the blood, this form of breathing has other added health benefits in the long term, such as lower blood pressure. (Lopes, Beda, Granja-Filho, Jandre, & Giannella-Neto, 2011) assessed such a capability submitting healthy humans to spontaneous and paced breathing protocols, estimating the fraction of beats occurring during inspiration, at low, medium, and high respiratory volumes, and during the first and second half of inspiration and expiration. Then, the same fractions were computed assuming a random uniform distribution of heartbeats, and the differences were compared. In order to gain a better insight into this matter

Breathing patterns are strongly influenced by disease processes of the respiratory and cardiovascular system and by psychological or emotional states. Conversely, the presence of balanced breathing patterns may reflect physiological resilience and efficiency and thus contribute to self-regulation and health maintenance. It has been suggested that breathing

contributes to health maintenance via its influence on respiratory sinus arrhythmia (RSA) and thus heart rate variability (HRV). (Courtney et al., 2011)

ETCO2 is the partial pressure or maximal concentration of carbon dioxide (CO_2) at the end of an exhaled breath, which is expressed as a percentage of CO_2 or mmHg. The normal values are 5% to 6% CO_2, which is equivalent to 35-45 mmHg. CO_2 reflects cardiac output (CO) and pulmonary blood flow as the gas is transported by the venous system to the right side of the heart and then pumped to the lungs by the right ventricles. When CO_2 diffuses out of the lungs into the exhaled air, a device called capnometer (Figure 5) measures the partial pressure or maximal concentration of CO_2 at the end of exhalation. During CPR, the amount of CO_2 excreted by the lungs is proportional to the amount of pulmonary blood flow. ("End Tidal CO2," 2009)

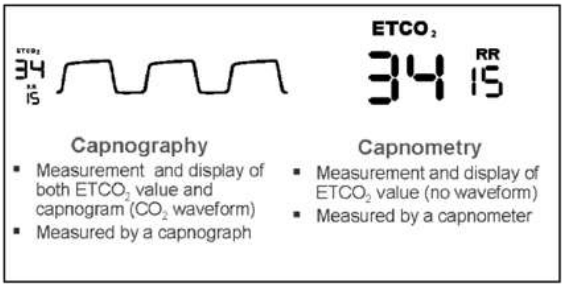

Figure 5: The capnometer measurements ("End Tidal CO2," 2009)

Overbreathing means bringing about carbon dioxide (CO_2) deficit in the blood through excessive ventilation during rapid, deep, and dysrhythmic, maladaptive breathing, a condition that may result in debilitating short-term and long-term physical and psychological complaints and symptoms. The slight shifts in CO_2 chemistry associated with overbreathing may cause physiological changes such as hypoxia (oxygen deficit), cerebral vasoconstriction (brain), coronary constriction (heart), blood and extracellular alkalosis (increased pH), cerebral glucose deficit, ischemia (localized anemia), buffer depletion (bicarbonates), bronchial constriction, gut constriction, calcium imbalance, magnesium deficiency, and muscle fatigue, spasm (tetany), and pain. Overbreathing is a behavior leading to the physiological condition known as hypocapnia, i.e., carbon dioxide deficit.

Cerebral hypoxia and cerebral hypoglycemia not only have profound effects on cognition and perception but also on emotionality: apprehension, anxiety, anger, frustration, fear, panic, stress, vulnerability, and feelings of low self-esteem. Cerebral (brain) oxygen and glucose deficits may trigger disinhibition of emotional states, i.e., release of emotions otherwise held in check. Loss of emotional control, intensification of emotional states, and exacerbation of debilitating stressful states of consciousness may result from overbreathing in challenging and adverse circumstances, e.g., flying phobias and debilitating public speaking anxiety. Emotional discharge in challenging environments itself may, of course, further exacerbate cognitive and other performance deficits.

Conclusion

The human emotional affected by Quran recitation was clearly presented according to the related works. There are many factors that affect the human emotion like heart rate variability and breathing behaviour. Quran recitation produced a significant relaxation which may be due

to that Quran has specific effect on human heart which lead to effect some hormone and chemical are responsible for relaxation

Corresponding Author
Eman Ghanem Nayef
PhD student at Center of Modern Language and Human Science, University Malaysia Pahang, Lebuhraya Tun Razak, 26300 Kuantan, Pahang, Malaysia
Email1: emangh81@yahoo.com

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