The Effects of Islamic Spiritual Activities on Psycho-Physiological Performance

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Abstract

In Islam, spiritual activities such as taubah and zikir are very common to the Muslim Ummah and these are generally performed to the perfection of individual's mind. In addition, it is believed that through these activities a connection can be made with the Almighty. Therefore, reasonably after the performance of these activities the psychophysiological performance of the respondents will be changed significantly. This significant change is traceable with the aid of GSR and HRV biofeedback. In this study, it is observed that remarkable changes of GSR percentage and accumulated coherence score of HRV among the 18 respondents due to the consequences of spiritual activities. Thus, it is possible to say that to make the positive changes of psychophysiological activities of any individuals spiritual activities may considered as a substantial stimuli in psychophysiological research.

Keywords: *psycho*physiology; GSR; HRV; Biofeedback; Spiritual activity

Introduction

The control of emotion is very important for individual. It has a very close relationship with behavior. For human adaptation, the capability to control emotion is so important (Ochsner, & Gross, 2005), for instance in anxious individuals experience more negative emotion (Campbell-Sills, 2011). Study shows that individuals who are able to control emotions have better athletic performance (Harmond, 2007). The similar things happen with the student also. Students who are able to control their emotion and behavior have better performance compare to those who are unable to control emotion or face difficulties. Generally, psychophysiological actions are extensively used to recognize the functioning of internal systems of the body through the response of the skin to an emotional stimulus. Commonly, typical psycho-physiological experiments deal with some cognitive, emotional or behavioral stimulus changes and measure the alternations due to the application of several biofeedback approaches [4].

Heart Rate Variability (HRV)

HRV is termed as a joint time/frequency study of the beat-to-beat responses in the heart rate [5]. HRV biofeedback aims to control the oscillation variability in heart rate [6]. Studies have revealed that higher HRV associated with creativity, psychological flexibility and capacity to adapt faster response in cognitive, affective and physiological emphasis [7]. On the other hand, low HRV is associated with anxiety, depression and different cardiovascular disease. Health factors can also cause an increase in certain heart

rhythms, including emotional, anxious thinking, breathing, pressure in the arteries and other behavioral and physiological changes [8].

Galvanic Skin Response

Galvanic skin response (GSR) is a psychophysiological phenomenon, which displays the changes of skin conductance in micro Siemes (μS) unit by skin containing sweat glands [9]. It is performed in several ways such as: by reducing skin resistance, decreasing impedance or adjusting the potential of response to a target or alerting stimulus. The necessary requirement for GSR is the presence of active sweat glands, by which any individual can get an idea about his sympathetic nervous system [10].

It is supposed that sweat spreads laterally, raises the ducts, moisturizes the stratum corneum and lessens its resistance. GSR is a reachable and responsive index of sympathetic nervous activity, reflecting centrally induced changes in peripheral autonomic arousal. Research is also used for verifying GSR, which can be used as an objective indicator of user's cognitive load level in real time, with very fine granularity. GSR is recognized as a somatic marker device [11] which could be useful for monitoring the psychological changes during the experience of Islamic approaches. Several studies have found that these approaches are utilized to reduce anxiety and stress [12]. Moreover, the authors thought that skin resistance as well as thermo vascular response varies during Islamic spiritual activities.

Spiritual Activity in Islam

In Islam everything is spiritual as all actions should be performed for the pleasure of God which comes from the view of Muslim's understanding of oneness of God (Tawhid). The understanding of spirituality in Islam is not like the secular understanding. It is confirmed that everything, individual does is in accordance of God's pleasure. The consciousness is dynamic, not static and God consciousness is based on how close the Muslim is with his God. And this communication is strengthened and established by going through the activities which have been prescribed by God Himself. This spiritual activity also effectively helps to change the negative behaviors and traits of Muslim. Some of these programs are offer prayer, remembrance of God, fasting, giving charity, meditation, reflecting on creation, recitation of zikir, reading and reflecting upon Quran and doing taubah. To develop a good character, Prophet Muhammad emphasized the individual to practice all the spiritual activities because these actions change the heart so the person closer to God and attain His consciousness [13].

According to Muslim's faith, taubah is believed to be one of the powerful tools for any person's positive psychological changes and persuades people from doing any other misdeeds. Taubah (repentance) is known as the regret and sadness that happen in the heart when anyone remembers his or her sin. It is the act of shunning sin and strongly resolving to abstain from the same sin in future; it controls a person from sin. Besides these intentions, a complete effort is made to pay off the precedent shortcoming. During taubah, participants should recollect their misdemeanors and offer penitence with soul attentiveness to Allah. Apart from this, regular recitation of Holy Quran is another proved mind therapeutic agent.

On the other hand, Zikir in etymology is derived from the Arabic word 'dzakara' which means remembering, in terminology means a practice speech through recitations and remembrance of Allah. Zikir is the physical and mental activities that

accelerate from reflection, attitude and behavior until the process of life that reminds us of God [14]. Zikir is able to calm the mind and plays a role in determining a person's character. Zikir is the best traditions of worship and most pleasing to Allah, the lightest and most easily done by not having certain conditions and rules. It can be done at any time, any place and at any state [15]. Zikir has psychological and spiritual benefits. Psychologically, it gives a sense of spiritual comfort and it gives a sense of being closer to God [16] When a person is more likely to do good deeds such as reciting zikir and remembering Allah, Allah will spare him from committing sins therefore helps forming a good personality within that individual.

Thus, in this study, taubah and zikir are the effective spiritual Islamic activities for real perfection and mental relaxation technique are considered as a research tool with biofeedback devices. In this context, HRV and GSR biofeedback can be considered as the physiological assessment appliance for fulfilling the specific target. Therefore, the authors tried to utilize HRV and GSR for monitoring the responses obtained after following the spiritual activities.

Taubah and Zikir Training

To improve the psychophysiological performance of the students, they were taught to control their emotions. Students were asked to focuses on their mind, heart rhythm and breathe at their resonant frequency. Controlling of these components has a direct relationship with emotional performance. Individuals, who are able to control emotions, have a direct effect on pulse and vice versa. Protocols which are taught to the participants are to recite zikir, doing taubah and try to control their emotion through breathing exercises and focusing on the mind. Students were requested to practice the training 2 times in a week for each time 20 minutes to familiarize themselves with the methods of controlling the mind, pulse and respiration. Students are required to do the training for 4 week.

Study Design

This study represents a two-group (treatment and control), randomized controlled study. Total participants 18 (Control Group=9, Training Group=9). Extreme caution was exerted by the researcher to ensure that all participants received the same feedback and training. Students were unaware about the treatment group to which they had been randomized and they completed their spiritual programs.

METHODOLOGY

Participants

The inclusion criteria for this study were: secondary school students, have low academic results, involved in the violation of discipline, age between 13-19years, religion is Islam, know the Islamic activities. Students who have severe physical problems such as psychiatric illness, severe head injury and asthma were excluded from the study.

Consent letter

Consent letter was distributed among the participants. All the participants fulfilled the inclusion criteria, signed and then back the consent forms. The consent letter described the purpose, the benefits and hazards in participating and the options to withdraw from the study.

Sample Selection

Since their academic result was not so good; so it was thought that they faced abnormal psychological conditions. The Nijmegen questionnaire[19] was posted to 22 students. 18 subjects had a score of >23 and were invited to enter the randomized controlled trial and they were given informed consent to participate in the study and the remaining respondent were excluded from the study. Volunteers were randomized into the biofeedback and control groups of the study by numbering them alphabetically and using random number tables to assign them in two groups. Randomization was supervised by the teacher of that school.

The aim of this work is to examine the pre and post mean difference between the two groups (experiment and control group). Therefore, subjects were screened for the presence of hyperventilation or abnormal breathing using a Nijmegen questionnaire. The Nijmegen Questionnaire consists of 16 complaints whose frequency of incidence can be indicated on a five-point ordinal scale (0 = never, 4 = very frequently). The complaints relate to different systems: (a) cardiovascular, e.g. 'palpitations'; (b) neurological, e.g. 'dizzy spells', 'tingling fingers'; (c) respiratory, e.g. 'shortness of breath'; (d) gastro-intestinal, e.g. 'bloated abdominal sensation'; (e) psyche, e.g. 'tense' [17]. The points accompanying each endorsed answer were used for measuring the summation.

Procedure

Students were randomly assigned to either the active training group or the control group. The intervention training group received four sessions of biofeedback training in a month one session in each week. These four sessions were selected based on previous studies, which can improve performance [18].Each session lasted at least 20 minutes, a total lack of the length of each session or inadequate training might be considered as error in methods and concepts in the study of biofeedback. The participants were encouraged to sit properly in relax way. After connecting the photo phlethysmograph, a fingertip or earpiece heartbeat sensor, which graphed the participant's heart rhythm onto the computer a monitor viewing the coherence score. The HRV biofeedback provided a low, medium, and high coherence score which reflects the individual's ability to control the emotion and balance the autonomic nervous system (ANS). It was assumed that higher coherence scores reflect greater ability to control of emotion and balance of ANS [19]. Coherence score at the beginning of each session was the baseline score which reflected physiological changes and it was fixed for 3 minutes for each participants. One can assume that higher coherence score reflects greater self-regulation. The independent coherence scores reflected the student's ability to control the emotion during the treatment session. Coherence scores of the HRV software were evaluated at two times during each biofeedback session. The first time data collection occurred at the beginning of the session when the participants were sitting quietly but not controlled emotion. Afterwards, the treatment group were asked to recite zikir "Laila ha illallah" and making taubah for 5 minutes. Physiological power of GSR through taubah and zikir was also studied during this research. In making a genuine taubah it was instructed that participants guess their status, because if earlier sins come to mind, with the taubah renewed, it is supposed that their previous taubah was inaccurate. Participants should not have too much confidence in their minds that taubah has already been made for particular sins; they should perform their duty. Whilst making taubah, participants should have a degree of self-control in mentioning their sins. It is not necessary to recite their whole list of sins. Thereafter, individuals made taubah in their mind. The preliminary

surroundings were the same as with the intention of prior experiments. Once the response became constant, the subjects were allowed to make taubah and the corresponding response was recorded. The control group only watched what the treatment group was doing.

Discussion

The effectiveness of random assignment in group equivalence was determined by conducting independent-sample t-tests on age of the participants. The training and control groups did not significantly differ by age. Statistical analysis showed that there were no group differences between control and biofeedback groups with respect to gender(100% male), race (100% Malay) and religion (100% Muslims).

Figure 1 depicts the progress in ACS across four sessions for both groups and the quantitative values are summarized in Table 1. The accumulated coherence score of the biofeedback training participants were analyzed to observe whether they actually learned the technique effectively. The statistical description was provided in Table 1. As ACS data of session three of the training group deviated from normality assumption Friedman ANOVA's test was conducted to compare the ACS across four sessions. The ACS of the biofeedback participants significantly change over four sessions (χ^2 (3) = 2.080, p< 0.005, or .000 (If read the exact significance). On the other hand, the control group did not have any effect: the ACS did not significantly increase across the sessions (χ^2 (3) = 17.133, p< 0.005, or .573 (If read the exact significance).

Table 1. Means and S.D of Percentage of accumulated coherence score (ACS) in the Biofeedback and Control Group

	Session Means (S.D)			
Group	**1**	**2**	**3**	**4**
Biofeedback	5.22 (5.47)	25.44 (9.40)	24.22 (9.96)	23.89 (11.52)
Control	6.11 (4.91)	7.78 (5.12)	6.00 (4.36)	6.00 (2.78)

Note: S.D = Standard Deviation

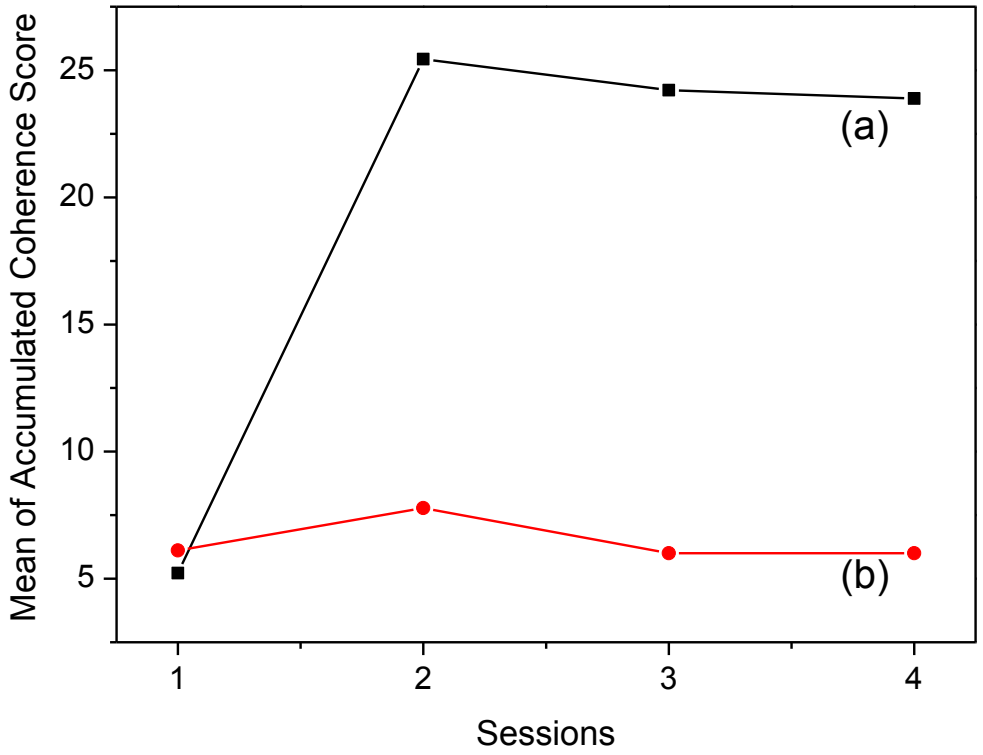

Figure 1: Participants progress in ACS across four sessions: (a) biofeedback, and (b) control group

It was found that the coherence score improved each session which reflect the autonomic nervous system homeostasis and a positive psychophysiological shift. This significant change of ACS for biofeedback group is believed to the consequences of performing the spiritual activities. Conversely, the respondents of control group just followed what the biofeedback group performed, causing the insignificant changes of ACS observed.

Figure 2 and 3 shows the effect of pre and post training of GSR percentage change for biofeedback and control group, respectively. In biofeedback group, it is observed that due to the spiritual activity GSR percentage change is increased. However, for the control group such type of changes is not noticed. The increasing trend of GSR in terms of the degree of response can be considered as an indication of the positive changes of emotional level due to the spiritual activity. The results provide preliminary evidence that the HRV and GSR biofeedback training was associated with a successful improvement of psychophysiological condition. The findings of this study would advance the knowledge of biofeedback use to increase the psychophysiological performance of the students, as it examines the inclusion of emotional focus as a component of self-regulation.

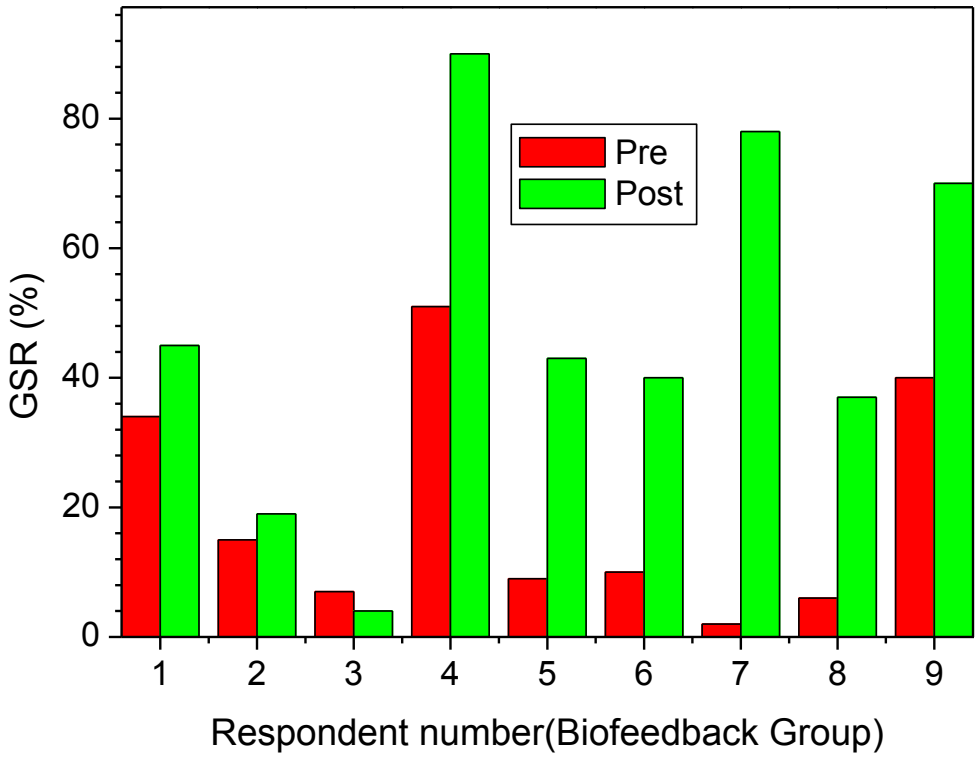

Figure 2: GSR percentage change for Biofeedback Group: pre and post

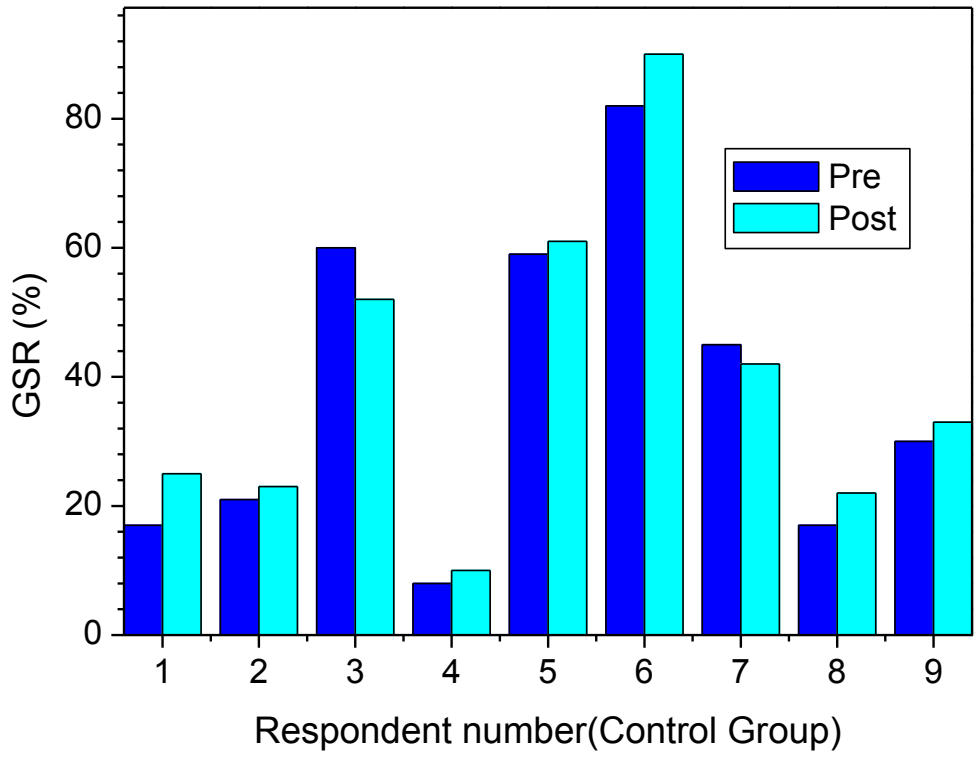

Figure 3: GSR percentage change Control Group: pre and post

Comparison with other researches

On the basis of literature, it was observed that Tanis, (2008) conducted the HRV biofeedback with Volleyball players, where she mentioned the increment of ACS due to the training of biofeedback [20]. Furthermore, Salam et al., (2013) reported the increasing of galvanic skin response percentage changes due to the effect of Islamic stimuli like taubah and listening to holly Quran recitation [21]. Likewise, Nagai et al., (2004) deals with the galvanic skin response (GSR) biofeedback training on seizure frequency in patients with treatment resistant Epilepsy [9]. They got better performance in GSR biofeedback toward the end of treatment and patients in the biofeedback group showed significant improvement in performance of GSR biofeedback, whereas patients in the control group did not show significant improvement in GSR biofeedback with time. These above mentioned researches are well consistent with the findings of this research.

Spiritual activities such as taubah and zikir are well-known to the Muslims for self-rectification of individuals and leading to the pleasure of God. Under this study, these activities are considered potentially in psychophysiological research. In this study, it is observed that in biofeedback group the accumulated coherence score is increased significantly though for control group remarkable changes is not seen. In addition, GSR biofeedback reveals that the GSR percentage change is also increased due to the spiritual activities among the respondents of biofeedback group but for control group this change is not significant. Thus, it is possible to say that the combined effect of Islamic spiritual activities and biofeedback training help to make positive behavioral changes of students. Therefore, this pattern of research could be introduced with a new dimension to control the emotion through spiritual activities and increase the psychophysiological performance to the students.

CONCLUSION

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