

THE INCREASE OF eHSP 72 IN MEMBERS OF DZIKIR GROUP

Siti Nur Asiyah¹, Suhartono Taat Putra², Kuntoro³

¹Psychology Study Program, Faculty of Dakwah, IAIN Sunan Ampel, Surabaya

²Department of Anatomic Pathology, Faculty of Medicine, ³Department of Biostatistics and Population, Faculty of Public Health, Airlangga University, Surabaya

ABSTRAK

Latar belakang penelitian ini didasarkan pada fenomena kecenderungan spiritualitas di masyarakat. Kelompok sufi dan dzikir muncul di mana-mana dengan jumlah peserta yang tinggi. Masyarakat pada umumnya tidak hanya membentuk kelompok dzikir sebagai fasilitas untuk berdoa, tetapi juga untuk memiliki rasa kedamaian, untuk menjadi sehat, untuk memiliki kebugaran fisik dan psikologis, dan bahkan untuk menyembuhkan penyakit. Tujuan penelitian adalah mengungkapkan peningkatan mekanisme imun akibat kegiatan dzikir dalam kelompok dzikir. Kategori penelitian ini adalah observasional. Desain yang digunakan dalam penelitian ini adalah time series dengan menggunakan variabel HSP 72. Sampel yang digunakan dalam penelitian ini adalah anggota kelompok dzikir "Miftahul Jannah" yang memenuhi kriteria inklusi, yaitu perempuan berusia 50-55 tahun, sudah menopause, mampu melakukan tugas dalam penelitian ini, siap menjadi subjek dengan mengisi informed consent, sehat setelah wawancara, cek fisik dan cek laboratorium, sebagai anggota baru dan tidak bergabung dengan kegiatan dalam kelompok dzikir dalam satu bulan terakhir. Hasil penelitian ini menunjukkan bahwa HSP 72 meningkat terus dari pengamatan 1, 2 dan 3, dengan signifikansi = 0,006 ($p < 0,05$). Kesimpulan dari penelitian ini adalah bahwa kegiatan dalam kelompok dzikir yang dilakukan dengan pengaturan, fokus dan rencana yang baik, seminggu sekali dalam durasi 120 menit dalam setiap pertemuan, dapat meningkatkan nilai HSP 72 dalam sirkulasi.

ABSTRACT

The background of this research was based on encouraging phenomena in today's modern society that is the tendency toward anything related to spirituality. Groups of sufis and dzikir appear everywhere with high number of participants. The society in general do not only make dzikir group as a facility for praying, but also to have a sense of peacefulness, to be healthy, to have physical and psychological fitness, and even to heal diseases. This research goal was to disclose the mechanism of increasing immunity as a result of dzikir activities in dzikir group. The category of this research was observational. The design used in this research was time series by using the variable of HSP 72. The sample used in this research was the members of dzikir group "Miftahul Jannah" who satisfied the inclusion criteria. They were female aged 50-55 years and already had menopause, being able to do tasks in this research, ready to be the subjects of this research by indicating or filling an informed consent or an agreement letter, being healthy after being interviewed, physical check and laboratory check, as a new member and did not join the activities in the dzikir group in the last one month. The result of this research showed that HSP 72 increased continuously from observation 1, observation 2 and observation 3, that was 0.006 ($\text{sig} = 0.006$) or $p < 0.05$. The conclusion of this research is that activities in dzikir group performed with good arrangement, focus and good plan, once a week in the duration of 120 minutes in each meeting, can increase the value of HSP 72 in the circulation.

Keywords: dzikir group, immunity, HSP 72

Correspondence: Siti Nur Asiyah, Psychology Study Program, Faculty of Dakwah, IAIN Sunan Ampel, Surabaya

INTRODUCTION

One encouraging phenomenon in today's modern society is the tendency toward spirituality. Sufi group or *dhikr* groups appear everywhere and are always flooded with participants. For example, *dhikr* assemblies led by clerics Haryono, Arifin Ilham and many more are visited by people from many areas and also in demand by the muslims as a part of modern society. The fact that is happening today is that people not only make *dhikr* assemblies as a means to worship, but they also take advantage of the assembly to gain peace, fitness,

physical and psychological endurance, and even treatment of a disease.

One example is the *dhikr* assembly under the care of KH Sholeh Hudi al Amin Muhyiddin at Baiturrahmah boarding school in Blimbing Malang. This *dhikr* assembly is much visited by students from several areas with different purposes. There are among those who deliberately take part in routinely to be closer to God, there are also those who follow the activities of *dhikr* to get peace of mind, and some follow the activity with the purpose to cure disease. A quite encouraging reality is that many of those who follow the activities of *dhikr*

with the goal of healing of an illness, and in fact obtain satisfactory results. (According to interviews with some of the clerics and students of Baiturrahmah boarding, Malang, on July 6, 2007)

From the above phenomenon, it can be assumed that public participation in *dhikr* assemblies, where there are *dhikr* activities, impact on the improvement of immunity. However, the mechanism of increased immunity after attending a *dhikr* activities can not be explained until now.

In this regard, the religious approach in the treatment process should be paid attention, in addition to other therapies. WHO agreement (1984) had been improved by adding spiritual element in it. Thus, being healthy is not only in the sense of physical, psychological and social, but also healthy in spiritual sense. Consequently to achieve a healthy society, involving health professionals is not enough. Moreover, the role of religious scholars cannot be ignored, especially in creating healthy society in a spiritual sense.

Several studies have been conducted and the results showed that religious individuals are better in coping with the suffering can accelerate healing process. In a study of women with HIV, it was found that there was a significant correlation between religiosity with the emotional status and immune status in African-American women infected with HIV (Wood 1999). In another study of cancer patients it was found that there is correlation between religiosity and survival in those patients (Ringdal 1996). Other studies in patients with metastatic breast cancer revealed that there is correlation between spiritual expression and immune status in patients with metastatic breast cancer (Sephton et al., 2001). Similarly, a study of a new senior high school students who took part in tahajud prayers regularly revealed that tahajud prayers conducted regularly and in humility can improve immune system (Sholeh 2003). There are many similar studies published in medical journals, so scientific facts showed that there is correlation between spirituality or religious activity and immune system.

Viewed from the perspective of mental health, prayer and *dhikr* have deep psychotherapeutic elements. Psychoreligious therapy with prayer and *dhikr* contain spiritual strength that can generate self-confidence (Self Confident) and a sense of optimism. Both psychological conditions are very essential for the healing of an illness, in addition to medicines and other medical procedures (Hawari 2005). In addition, prayer and *dhikr* also have benefits for the prevention of mental shock and psychiatric disorders, so it can be beneficial to the development and improvement of life. Thus, prayer and

dhikr has the function of curative, preventive and constructive for health (Purwanto 2007).

Resistance mechanisms of the body will be revealed more clearly and detailed through psychoneuroimmunology approach, which describes the interaction between psychological factors and physical factors (Ward 2007). Psychoneuroimmunology explains relationship between psychosocial factors, nervous and immune systems. Psychosocial stress will be captured by the five senses, and sensory nervous system will proceed to the nerves in the brain, the limbic system, via neurotransmitters. Furthermore, psychosocial stimulus, that acts through the autonomic nervous system, will proceed to the hormonal glands (endocrine), which is related to the immune system (Hawari 2005).

The concept of psychoneuroimmunology is not a union of the three terms of (psychological, neuro and immune), but it is three complementary disciplines that define the central nervous system as the point of capture. On that basis, any stimulation of central nervous system that causes the secretion of neurohormone responses will provide changes in activity in the cells of the body. Some are known as neurohormonal ACTH, cortisol, catecholamines, endorphins, enkephalin and somatostatin (Setyawan 1995). Variables that can be used to explain the increase in immunity include IL-1 β , IL-6, and NK cells. Some recent studies reveal that there are specific proteins that can serve as indicators of both physical and psychological stressors, namely heat shock protein (HSP 72). HSP 72 in the peripheral circulation can contribute to the modulation of immune response.

Although research on the correlation between religiosity and the healing of physical illness had been done intensively, enhancement of immunity in *dhikr* assemblies has not been studied scientifically. If this can be disclosed and explained scientifically, the religious approach through *dhikr* assemblies can be applied as part of health care, both as promotive, preventive, and curative actions. This study aimed to disclose the mechanism of increased immunity in participants after attending an assembly of *dhikr* activities and also to confirm the elevated levels of eHSP-72 in the *dhikr* participants after following activities.

MATERIALS AND METHODS

Type of research in this study was observational, while the design of the study was time series. Population used in this study were participants of majlis *dhikr* Miftahul Jannah, at Darussalam boarding school, Gadung Driyorejo, Gresik. The determination of the sample in

this study was based on the same scope of the study, as that in the study by Siswantoyo (2007) by using a sample size formula by Kuntoro (2008), which showed that the sample size in this study were at least 12 people.

Site for conducting *dhikr* activity was at Darussalam boarding school, Gadung, Driyorejo, Gresik, while the laboratory tests were carried out in collaboration with the Ksatria Laboratory, Karang Pilang, Surabaya, and Physiology Laboratory, Brawijaya University, Malang. The study was conducted for three weeks in February 2009 with details of the preliminary observations were made on three days prior to the regular *dhikr*, and the second and third observation was performed every 24 hours after the activities of *dhikr*, which was held once a week. Examination of the levels of eHSP 72 used ELISA.

Data analysis was performed by descriptive and inferential statistics using SPSS for windows to reveal the standard deviation and the average (mean) of all variables. Statistical analysis was then performed using a repeated measurement on the basis that the studied sample was a single sample examined in three-time observation, so that the data in this study were related data.

RESULTS

The mean eHSP72 examination was conducted 3 times, i.e., once in three days prior to the *dhikr*, and twice at 24 hours after the execution of *dhikr*, which can be seen in Table 1. By looking at the average (mean) in the table, it can be seen that the results of the HSP 72 in observation 1 is 582.1000, the second observation is 598.4333 and the observation 3 is 624.3833. That is, descriptively it can be seen that the results of eHSP 72 tend to increase from observation 1 to observation 3. More detail can be seen in Figure 1. The homogeneity of the data can be proved through Mauchly's test of sphericity as indicated in Table 2. In Table 2, the results of Mauchly's test of sphericity of eHSP 72 is 0.006 ($p = 0.006$) which is then corrected by Epsilon (α) Greenhouse-Geisser method to be 0.609 or $p > 0.05$, which means that the variance is homogeneous. Furthermore, to determine the relationship between *dhikr* activities in *dhikr* assembly and the increase of eHSP 72 can be seen in Table 3. Table 3 shows that the results of the eHSP 72 was 0.006 in 3 observation times ($p = 0.006$) or $p < 0.05$ which means significant increase of eHSP 72 between observations 1, 2 and 3.

Table 1. Examination eHSP 72

	N	Range	Min.	Max.	Mean	SD	Variance
obs1	12	130.00	523.60	653.60	582.1000	42.65400	1819.364
obs2	12	260.00	505.60	765.60	598.4333	78.18490	6112.879
obs3	12	208.40	516.60	725.00	624.3833	64.30651	4135.327

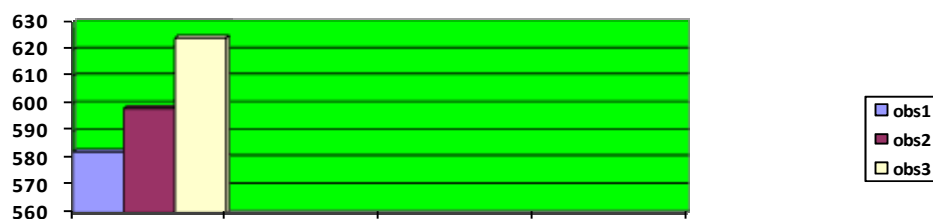


Figure 1. Examination eHSP 72

Table 2. Mauchly's Test of Sphericity (b) eHSP 72

Effect within subjects	Mauchly's <i>W</i>	Approx. Chi-Square	Df	p	Epsilon(a)		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
FACTOR1	.359	10.257	2	.006	.609	.645	.500

Table 3. Tests of Within-Subjects contrasts eHSP 72

Variance source	FACTOR1	Type III Sum of Squares	Df	Mean Square	F	p
FACTOR1	Linear	10727.282	1	10727.282	11.290	.006
	Quadratic	184.961	1	184.961	.050	.828
Error(FACTOR1)	Linear	10451.498	11	950.136		
	Quadratic	40900.366	11	3718.215		

DISCUSSION

The samples were taken from members of the *dhikr* Miftahul Jannah who met the inclusion criteria, ie, female, age 50-55 years, postmenopausal, capable of performing tasks in this study, willing as the subject of this study, which was expressed by completing informed consent or a approval letter, in good health, after anamnesis, physical examination and laboratory, new member, and did not take part in other *dhikr* assemblies in the past month.

Sample selected were women aged 50-55 years, postmenopausal state in the hope of similarity between each sample. There were two reasons for the selection of a sample of women who had menopause. First, the rule applicable in the following *dhikr* activities in the Miftahul Jannah *dhikr* assembly, where there was a series of worship that requires the perpetrator in a state of purity (not having large and small *hadats*). By choosing a sample who had been on the menopause, the absence of *dhikr* assembly members for reasons of periods could be avoided. Second, related to hormonal influences on one of the study variables, namely eHSP 72, where eHSP 72 levels increased when there is an increase in the hormone estrogen. This will create a bias to the research, because the eHSP 72 level, which is expected to have increased after participants take part in *dhikr* assemblies, can be confused with elevated levels of eHSP 72 caused by an increase in the hormone estrogen.

A study conducted in female mice to obtain the relationship between estrogen with eHSP 72. The study

states that at the highest levels of estrogen produces a higher eHSP 72 even without the stress when compared to the examinations in female mice with lower estrogen levels (Ader 2007). To that end, the selection of postmenopausal women is in order to eliminate such bias, because it is known that postmenopausal women have decreased the hormone estrogen, thereby increasing eHSP 72. This was not a hormonal effect.

Samples were selected from women, because theoretically there is a difference in the immune systems of men and women. Before puberty, the immune system in men and women are equal. The immune system evolved without the influence of sex hormones. But after puberty, androgens have turned out to be male immunosuppressive. The presence of androgens during adulthood is persistent and does not fluctuate to old age. Such condition does not occur in women, where, since puberty, there was integrated immune response in women with the endocrine system, so the immune system in women was more stable than in the immune system in men (Baratawidjaja 2006). Thus, the sample selection is done by women a reason to avoid bias resulting from the research results of hormonal influence (androgens) that are immunosuppressive.

Determination of the sample by anamnesis, physical examination and laboratory was in order to gain equality in the health status of all recipients. History taking conducted to obtain information about the identity of the subject, having experienced a history of disease, history of treatment which may be undertaken by the research subjects, as well as the history of the implementation of *dhikr* which may have been done before.

Medical history traced through anamnesis is the possibility of allergies and autoimmune diseases that would interfere with the immune system. In addition, well worth exploring the history of the use of immunosuppressive drugs that can also disrupt the immune system. While on the implementation of *dhikr* is anamnesis in order to obtain information about the activities of *dhikr* which may have been done in recent time. This is in addition to get the same conditions on the subject, also to avoid bias in the results of the study, in which immunity can be generated due to the influence of other *dhikr* assemblies, and not by the assembly referred to in this study.

Further physical inspection of measuring height, weight and vital sign checks, the tension, pulse and respiratory rate (see table 1 and 3). For vital sign checks performed on every observation, mainly to clarify the possibility of hypertension, because hypertension will lead to increased levels of eHSP 72. As stated by Johnson & Fleshner that HSP 72 in the circulation / endogenous HSP72 (eHSP72) can be found in patients with various diseases, such as hypertension, atherosclerosis, coronary heart disease (Johnson and Fleshner 2005). When that happens, then the results of 72 participants eHSP *dhikr* Assembly which is expected to have increased after following the *dhikr* activities, will be confused with a condition that occurs in hypertensive subjects.

For subjects who have been through anamnesis and physical examination, and meet the predefined inclusion criteria, the laboratory examination. Type of examination required include hemoglobin (Hb), erythrocytes, leukocytes, heart physiology (SGOT and SGPT), renal physiology (BUN and creatinine), GDA and total protein. From the results of laboratory tests, it is known that each is in the normal range.

The similarity of the age range and health status of all recipients, they are expected to have similar capabilities in the following *dhikr dhikr* Miftahul assemblies organized by jannah. In addition, the common characteristics possessed by the subject of research, is also expected to give a good influence on the results of the study.

Of tables and graphs on eHSP 72 always known that an increase of observation 1, observation 2 and observation 3. This fact can be explained that the activities of prayer and *dhikr* as well taushiyah followed by a new panel of *dhikr* Miftahul Jannah can be regarded as psychological stressors that can trigger increased levels of HSP 72 in the blood. This condition is consistent with research that explains that HSP 72 can also be found in the peripheral circulation in normal individuals, the process of cell death without necrosis, as well as an increase in

individuals who experience psychological stress (Asea 2007, Johnson and Fleshner 2006).

In a series of activities is provided taushiyah *dhikr* in the form of a review of the book of al-hikam describing efforts to draw closer to God, to cleanse the liver through the avoidance of acts that are not good (al-madzumah morality) and replace it with the good (al-mahmudah morality). Through the senses of hearing, the entire congregation listening to what is delivered by the imam (murshid) to understand the study material.

Vilyanur Ramachandran explains that there are parts of the brain responsible for responses of human spiritual and mystical. They call it a god spot and located in the temporal lobes. Lobe is the case the meaning of what is heard. In this place, the message is read by the brain and sent to the other lobe, especially in the frontal lobes are to be addressed (Pasiak 2005).

While prayer and *dhikr* is done is based on books that serve as a guide by a panel of *dhikr* Miftahul Jannah under the leadership of the priest. All members of the congregation council mimicked *dhikr wirid* which was read by the priest. For example the reading of *ayat kursi*, asmaul husna, and *doa sapu jagat*. All of this *wirid* should be read with full concentration to achieve the perfect concentration. Humility 'in question is a relaxed condition, focus, and concentration (Purwanto 2007).

However, new participants *dhikr* assemblies twice following the activities of this *dhikr* is in the learning process (learning process) to be able to follow the activities of prayer and *dhikr* in humility 'and full concentration in order to achieve a state of relaxation that is characterized by feelings of calmness and clarity of mind (Pasiak, 2005). This makes the learning process becomes idle mind to digest all the information coming through the senses. This condition can be categorized as psychological stressors as evidenced by elevated levels of eHSP 72 significantly over the three observation times. That is, a state of relaxation is still not achieved, because the assembly of new participants in *dhikr* is still on the learning process. In this learning period, it is possible there are some things that can interfere with concentration, among other things: the mind has not come into the self, there is a high emotional turmoil, mind distracted by the turmoil of passion, the mind is filled with many problems, have not been able to enjoy the worship, and worship only because of fear of sin (Hakim 2002).

In addition, prayer and *dhikr* is done within 90 minutes, for a beginner is also a stressor that can lead to psychological tensions. Psychic tension may occur as a

result of the implementation of prayer and *dhikr* for a long time with the rules established by the council *dhikr*. In addition, psychological stress can also occur as a result of any remorse for sins which have been carried out, the desire to keep close to God as his name, and expectations are communicated through prayer and *dhikr*. For example, when reading the forgiveness (astaghfirullaahal adzim) which means an application forgiveness of God for all the sins that once done, the message of *tauhid* sentence (*laa ilaha illallaah*) which is the ultimate statement of the oneness of God, so that only God was the proper man pleading for help.

Psychological conditions such as these can be responded by the hypothalamus. The hypothalamus has an important role in the regulation of emotions and responses to stress, so that the hypothalamus is also known as "stress center" given the particular role in mobilizing the body to react to stress. In this case, the hypothalamus controls the pituitary to produce several hormones. This control is very important to mobilize a physiological process in order to respond to the state of fight or flight (Atkinson, et al. no year).

On the other hand, there is the hypothesis that increased eHSP 72 in the circulation can occur during stress, once triggered by the sympathetic nerve activity and norepinephrine hormones. This hormone norepinephrine which then triggers an increase in circulating concentrations of HSP 72 by $\alpha 1$ -ADR. Stimulation of $\alpha 1$ -ADR This will cause an increase in intracellular Ca^{2+} and stimulates the release exosome containing HSP 72. Increased HSP 72 can modulate the immune response through the interaction of several surface receptors expressed on specific immune cells (Johnson and Fleshner 2006, Asea 2007).

This hypothesis has been demonstrated in this study, where there was an increase in blood levels of eHSP 72 after 24 hours of the implementation of the *dhikr*. Similarly, when performed 72 repetitions of eHSP examination at 24 hours after the execution of the second week of *dhikr*. This was evidenced by statistical tests using a repeated measurement which gives the figure of significance 0.006 ($p < 0.05$) which means there is significantly increased levels of eHSP 72 participants take part in the assembly after *dhikr*. In several studies have reported that eHSP 72 can stimulate the synthesis of nitric oxide (NO), TNF- α , Interleukin 1- β (IL1- β) and IL-6. In addition, eHSP 72 can also enhance NK cell proliferation and sensitivity (Johnson and Fleshner 2005). Thus studies have provided preliminary information that the *dhikr* activities undertaken by the participants as much as two times the new assembly Miftahul Jannah *dhikr* potentially enhances immunity. The fact is in line with Hawari

opinion stating that it contains elements of prayer and *dhikr* in-depth psychotherapeutic. Psychoreligious therapy is less important in psychiatric psychotherapy, because it contains psychoreligious therapy or spirituality spiritual strength that evokes a sense of confidence and a sense of optimism (Hawari, 2005).

Zakiah Daradjat, experts and practitioners in counseling and psychotherapy Islam also believes that prayer can provide a sense of optimism, zest for life and relieve feelings of hopelessness when one deals with the situation or problem that is less fun for him. Support for the spirit of prayer into one's life. Prayer can foster a sense of optimism in the self, and keep a sense of pessimism and despair, so that prayer contains benefits for the prevention of the occurrence of mental shock and psychiatric disorders. Moreover, the prayer has benefits for the development and improvement of the spirit of life (Purwanto 2007). Confidence and optimism was also instrumental in improving immunity to achieve a state of homeostasis. As McEwen opinion that the magnitude of the stress response is not only dependent on the stressor and the individual, the stress response also depends on the strategies adopted by individuals to cope with stress (Pinel 2009). One important factor is the ability of individuals to be able to control stress. Perceptions of control mediate the effect of stress on the human immune system. In one study of women with breast cancer found that patients who are pessimistic are more likely to experience a new tumor in a period of five years, even after they are taken into account the severity of physical illness (Gunawan & Sumadiono 2007).

CONCLUSION

With reference to the results of research and discussion in the previous chapter, it can be concluded that in the *dhikr* assemblies of *dhikr* activities conducted on a regular basis, targeted and programmed, with a frequency of once per week with a duration of 120 minutes each time during the meeting, can raise levels of HSP 72 in circulation (eHSP). Thus the activities of *dhikr* in *dhikr* assembly, can be explained scientifically by using a psychoneuroimmunology approach through the hypothalamic-sympathetic-adrenal medulla can lead to elevated levels of eHSP 72 and potentially enhance immunity. In practical terms, the activities of *dhikr* in *dhikr* assembly is done with regular, targeted and programmed to act as an immunomodulator is cheap, easy and valuable service.

REFERENCES

1. Ader R. 2007. Psychoneuroimmunology. 4th ed. Vol 1-2, Academic Press, USA.
2. Asea A. 2007. Mechanism of HSP 72 Release. <http://www.ias.ac.in/jbiosci> 32:572-584, diakses 7/2/2008.
3. Atkinson RL, RC Atkinson, EE Smith, DJ Bem. tt. Pengantar Psikologi. Jilid 2. Batam: Interaksara. hlm. 85-109, 349-390.
4. Baratawidjaja KG, 2006. Imunologi Dasar. Edisi kedua. Jakarta: Fakultas Kedokteran UI. hlm. 19-20, 34-44, 247-264.
5. Gunawan B & Sumadiono. 2007. Stres dan Sistem Imun Tubuh: Suatu Pendekatan Psikoneuroimmunologi. Cermin Dunia Kedokteran 154: 13-16.
6. Hakim T. 2002. Mengatasi Gangguan Konsentrasi. Jakarta: Pustaka Swara. hlm. 99-107.
7. Hawari D. 2005. Dimensi Religi Dalam Praktek Psikiatri dan Psikologi. Jakarta: Fakultas Kedokteran-Universitas Indonesia. hlm. 5-8.
8. Hawari D. 2005. Doa dan Zikir sebagai Obat. Surabaya. Kongres Nasional I PNI. Surabaya, 2005.
9. Johnson JD & Fleshner M. 2006. Releasing signals, Secretory Pathways, and Immune Function of Endogenous Extracellular Heat Shock Protein 72. *Journal of Leukocyte Biology* 79: 425-434.
10. Kuntoro. 2008. Metode Sampling dan Penentuan Besar Sampel. Surabaya: Pustaka Melati. hlm. 227-228.
11. Pasiak T. 2005. Revolusi IQ/EQ/SQ antara Neurosains dan Al-Quran. Bandung. Mizan. hlm. 65-71, 161-180.
12. Pinel JP.(2009). Biopsikologi. Yogyakarta. Pustaka Pelajar. hlm. 541-570.
13. Purwanto S. 2007. Psikoterapi Doa. <http://setiyo.blogspot.com/2007/02/terapi-doa.html>. diakses 07/02/2008.
14. Ringdal IG. 1996. Religiosity, Quality of Life and Survival in Cancer Patients. *Social Indicator Research Journal*. Vol. 38, No.2.
15. Sephton SE, Koopman C, Schaal M, Thoresen C, Spiegel D. 2001 Spiritual Expression and Immune Status in Women with Metastatic Breast Cancer: An Exploratory Study, *The Breast Journal*. Vol. 7, Issue 5.
16. Setyawan S. 1995. Pengaruh Latihan Fisik Aerobik dan Anaerobik terhadap Pola Respon Ketahanan Tubuh. Disertasi. PPS Unair Surabaya.
17. Sholeh M. 2003. Improvement of Immunological Responses Through Tahajjud Prayer. *Jurnal Ilmu Dakwah*. Vol. 8, No.2.
18. Siswantoyo. 2007. Pengaruh Olahraga Pernafasan Satria Nusantara Tingkat Pradasar-Dasar Terhadap Modulasi Imunitas. Disertasi. PPS Unair Surabaya.
19. Wardhana. 2008. Psychoneuroimmunology: Connecting Mind Body And Spirit. <http://www.kanglaonline.com/index.php?template=kshow&kid=1075> diakses 27/02/2008.
20. Wardhana. 2008. Spiritualitas Dalam Pelayanan Kesehatan. <http://www.kanglaonline.com/index.php?template=kshow&kid=> diakses 27/02/2008.
21. Wood TE. 1999. Religiosity Associated with Affective in Symptomatic HIV-Infected African-American Women. *Journal Of Health of Psychology*. Vol. 4, No. 3.