

## STRATEGIES TO REDUCE ANXIETY OF PATIENTS WITH CHRONIC KIDNEY DISEASE DURING HEMODIALYSIS

**Esrom Kanine<sup>1</sup>, Johana Tuegeh<sup>2</sup>**

Polytechnic Health Science Ministry of Health Manado

*Email: [esromkanine@gmail.com](mailto:esromkanine@gmail.com)*

### ABSTRACT

**Background:** Anxiety is one of the most common psychosocial problems experienced by patient of chronic kidney disease (CKD) during hemodialysis. According to some studies, anxiety significantly affects the function and quality of a person's life. Anxiety is happened...% among the CKD patients who are experiencing hemodialysis. **Aims:** This study is conducted to analyze the effectiveness of strategies to reduce anxiety of patients with CKD during hemodialysis. **Methods:** This research is conducted using quantitative research design. Seventeen samples were chosen using purposive sampling strategy, using quasi experimental pre-test and post-test without control group. Some including people aged 30-55 years old, have mild anxiety experience (score min.5) and are in normal blood pressure during the time of the intervention. The level of anxiety was measured by Hamilton Anxiety Rating Scale. Data was analyzed using Wilcoxon test, with p value < 0,05. **Result :** The mean anxiety levels decreased before and after intervention were 12.76 to 8.76, median 13.00 to 9.00 (Wilcoxon test equal to -3.425 and p value = 0.001). **Conclusion :** This findings describes the benefits and significance of a combination from relaxation training and hypnosis of five fingers which can reduce the scores of anxiety response in CKD patients during hemodialysis.

Keywords :

Chronic Kidney Disease, Anxiety, Relaxation Training.

### 1. Introduction and Objectives

The kidneys are important organs that have many functions such as filtering blood from excessive sodium and metabolic waste, regulating the body fluid to keep the biochemical substance in equilibrium. Prevalence of Chronic Kidney Disease (CKD) in North Sulawesi was 0.4% and it is higher than the national prevalence that was 0.2% (Riskesdas, 2013). CKD is a progressive irreversible renal dysfunction and could not be recovered, and it was needed the renal replacement therapy. CKD Patient with end-stage phase should get therapy such as hemodialysis or renal transplantation (Sudoyo et al, 2010).

Hemodialysis is a one of renal replacement therapy that remove the extra protein in the body and maintain fluid and electrolyte balance. This therapy allows the synthetic membrane called dialyzer replacing the function of kidneys to keep the balance of body fluid. The blood will be filtered through semi permeable membrane acting as an artificial kidney (Sudoyo et al, 2010). Now, the number of CKD patients during hemodialysis increasing dramatically every year. The Indonesia Renal Registry (IRR) reported that patients diagnosed with CKD increased significantly from 4.977 in 2004 to 17.193 in 2014. The one month survival

rate of patients during hemodialysis is 87.3% and one year survival rate is 46.7%.

Data from Hemodialysis unit in Prof.R.D Kandou Hospital showed that there were 240 patients being treated for hemodialysis twice a week. It was estimated that approximately 70 patients or 30% have experienced mild to moderate anxiety. Patients with CKD during hemodialysis experience psychosocial problems, such as depression, anxiety, loneliness, social isolation, despair, and helplessness (Ahkari et al, 2014). Duration of hemodialysis become the etiology of psychosocial problem. Each patient needs about 4 or 5 hours in one session of hemodialysis. Patients with end stage renal disease are difficult to accept the fact that they will spend their life time receiving hemodialysis therapy.

Anxiety is an emotional experience and an individual's subjectivity that is described with an unclear fear of its source and responds to one's psychological, behavioral, cognitive and attitude (Stuart, 2005). Anxiety affects the function and patients quality of life significantly. This condition is based on the resignation and acceptance of the situation that hemodialysis is just an effort to prolong life expectancy.

One of non-pharmacological treatments to treat anxiety is cognitive behavior therapy (CBT). CBT as non-pharmacological therapy is very strategic to reduce anxiety and restructure cognitive function in learning new behaviors. Other non-pharmacological therapy is relaxation training and its believed could reduce the anxiety level, as well as biofeedback therapy, systematic desensitization, interoceptive exposure, flooding, vestibular desensitization training, prevention response and eye movement desensitization and reprocessing.

Relaxation training are also used in the clinical field since the early 20th

century when Edmund Jacobson undertook research and reported in a progressive Relaxation book published by the Chicago University Press in 1938. In this book, Jacobson describes about the things that people do when stressed time and relax situation. In the condition of mind and body relaxation, the tension that often makes the muscles tightened will be ignored automatically (Zalaquet & McCraw, 2000 in Ramdhani & Son, 2009).

This study aims to analyze the characteristics of CKD patients including age, sex, duration of CKD and to analyze the differences in anxiety response of patients with CKD pre and post combine relaxation training and five-finger hypnosis intervention.

## **2. Materials and Methods**

This research used quasi experimental design by pre test and post test without control group.

### **2.1 Population and Sample**

The population of this study was 240 CKD patients with a sample size of 35 CKD patients according to the sample calculation formula by Lemeshow (2004). Sampling technique that used in this study was non probability sampling (purposive sampling) by fulfilling the inclusion criteria: age 25 - 55 years old, have anxiety experience or being anxious with lowest score of 5, able to communicate well and clear, able to express experience, does not have complication of heart disease and hypertension during hemodialysis and willing to be participants by giving consent as respondent.

### **2.2 Research Instruments and Data Collection Techniques**

The Hamilton Anxiety Rating Scale (HARS) instrument was used to measure anxiety scales. Quantitative approach of

data collection techniques are done through the following stages: first stage, was done after the researchers were being approved and passed the ethical test by health ethics research committee, Poltekkes Kemenkes Manado. The second stage was to ask the respondent's approval on the informed consent sheet. Then pre test by screening anxiety on CKD patients using HARS instrument on the first day. Relaxation training and five-finger hypnosis were implemented on the second day until the fourth day, for 45 minutes. Post test measure was done on the fifth day.

### 2.3 Statistical Analysis

Statistical analysis was processed using SPSS computer program. The data of age and duration of CKD was analyzed and showed in frequency distribution tables (mean, median, SD and min-max value). Statistical analysis for bivariate data used non parametric test (Wilcoxon test) for abnormal data distribution.

### 3. Results

This study was conducted for one month, started from October until November 2017 in hemodialysis unit of RS Prof. Dr. R. Kandou Manado hospital. Result of statistical analysis of CKD patient was shown on table 1 to 3.

Analysis of univariate data of 17 respondents showed that the mean of age of CKD patients was 43.35 years with median value was 51 years, whereas lowest age was 30 years and highest age was 55 years with deviation standard value 9.956. Mean value scoring of anxiety before intervention was 12,71 while after intervention was 8.76 point. Median anxiety response rate before and after intervention was 13 and 9. The highest score before intervention was 15 and after intervention was 12.

Statistical analysis for bivariate data used non-parametric test (Wilcoxon test) for abnormal data distribution. The result of statistical analysis showed that the difference of anxiety response before and after intervention was 3.95 with Z score on Wilcoxon test (- 3,425) and p value 0,001.

### 4. Discussion

The findings of study indicated that anxiety response of 17 respondents CKD patients fluctuate from the level of mild to moderate anxiety. CKD patients during hemodialysis are particularly susceptible to psychosocial problems of anxiety and depression that affect the quality of life of the patients.

A number of research, among others conducted by Vasilopoulou et al. (2016), reported the comparison of anxiety and depression responses in 395 CKD patients undergoing hemodialysis in Greece, reportedly the majority of CKD patients revealed an anxiety experience at the highest level of 47.8% compared to depression at a low level even though the percentage was 38.2 %.

The results showed an anxiety response prior to the highest five-finger relaxation and hypnosis exercise of 15.00 points, at a mild anxiety level. The study literature explains that anxiety is described as an unclear fear and is not supported by the situation (Videbeck, 2008).

Although anxiety is at a mild level, researchers give special attention to one element of the statement on the HARS instrument on self-perception assessment during hemodialysis as a precipitating factor for unpleasant mood swings. A total of 10 respondents (58.82%) of the 17 respondents experienced a mood change with a percentage of 50% of man (5 respondents) and of woman (5 respondents).

Another statement item in the HARS instrument explains the mood changes

associated with the depressed mood described as having decreased concentration. The results showed as many as 11 respondents (64.7%) of the 17 respondents with a percentage of 54.4% in woman and 45.5% in man.

The results of this study were supported by a research report by Najafi (2016), which reported no difference in the prevalence of depression and anxiety in both groups of hemodialysis patients, in which correlation analysis reported anxiety correlated with age. The prevalence in women amounted to (41.7%) lower than men (31.5%). Other studies reported that the prevalence of anxiety and depression in CKD patients undergoing hemodialysis did not affect the prevalence of anxiety and depression of CKD patients (Seidel, et al 2014). The researcher's assumptions emphasize internal factors of anxiety caused by self-assurance of a fragile CKD patient's self-efficacy during hemodialysis contributes to threats, internal conflicts and fears.

The results of this study illustrate anxiety condition characterized by the fear of the future experienced by 13 respondents (76.5%) and insomnia condition experienced by 11 respondents (64.7%). According to the study of theories of the human, brain is a unique organ in regulating the thinking processes, language, awareness and human emotions, including coordinating human behavior. The role of neurotransmitters affects attitudes, emotions and behaviors. Excessive acetylcholine and serotonin neurotransmitters in the brain trigger depression and anxiety.

Based on the findings on this study, some respondents experienced intellectual changes as anxiety response to feelings of fear, tension and insomnia. Anggarwal et al. (2017) reported the results of a cross-sectional study of 200 patients with stage III CKD reported a significant correlation

with the prevalence of depression (69%), anxiety (71%) and insomnia (86.5%).

In the HARS instrument it is explained that the thought and feeling of tension become the trigger factor of CKD patients easily experience anxiety during undergoing hemodialysis. The research data shows as many as 10 respondents (58.8%) express feelings easily worried. Emotional conflicts and studies of family responses support anxiety (Stuart & Laraia, 2005). Demographic characteristics in this study reported the difference in the percentage between man and woman is not very much different. Responsibility as head of the family and as a mother of family member contributes to the family. Respondents verbally disclose family responsibilities in the future when CKD patients no longer reside in the middle of the family.

Intervention conducted in this study aims to reduce feelings of anxiety. The literature review explains that relaxation exercises reduce tension in the body and mind. Relaxation exercises affect the circulation of the brain's blood more optimally by stimulating some types of neurotransmitters. Reciprocity is a change of cognitive distortion in the brain is believed to be able to eliminate insomnia disorders in CKD patients.

Research made by Martha et al. (2008), reported progressive muscle relaxation exercises reduce tension during headaches, insomnia, treatment in cancer patients, reduce pain in patients with arthritis inflammation. The results of this study showed anxiety response decreased at the lowest score level of 6 points after intervention. Although no significant decrease in scores of anxiety response before intervention from scoring 15 points to 12 points on post test measurements compared to pre test.

Some related studies include Carolyn et al., (1989), reported that statistical test

results significantly reduced anxiety and improved mental health (p-value <0.001) by combining transcendental meditation techniques, progressive muscle relaxation and cognitive behavioral strategies on a group of black students. The results of this study are supported by research from Karin, et al. (2015), which stated that Effect of progressive muscle relaxation on decreased secretion of Cortisol hormone causes psychological stress on 100 students. The results reported there was a difference in Cortisol hormone decline before and after progressive muscle relaxation by 10% and 8%. The effectiveness of this intervention is not influenced by neuroticism, sex, age and smoking status.

### 5. Conclusions

This findings revealed that there were positive effect of combination therapy between relaxation and five-finger hypnosis training which can reduce the scores of anxiety response in CKD patients whoundergo hemodialysis.

The nurse may apply the combination therapy of relaxation and five-finger hypnosis training as a non pharmacologic treatment to reduce anxiety of CKD patients in the hemodialysis unit.

Large and varied samples are needed for this research is more innovative and varied.

### 6. Tables

The results of statistical analysis of quantitative data as follows:

#### 6.1 Univariate Analysis

**Tabel 1. Demographic Characteristics of CKD Patients n= 17**

Variable	Frequency	Percentage
Gender :		
Male	9	52.9
Female	8	47.1

**Tabel 2. Frequency Distribution of CKD Patient Demographics n= 17**

Variable	Mean	Median	SD	(min-max)
Age	45.35	51	9.956	25 - 55
CKD suffering time	1.88	2	1.317	1 - 6

**Tabel 3. Anxiety Measurement Elements According to HARS n = 17**

Anxiety Measurement Elements of HARS	Frequency	Percentage
Anxiety condition	10	58.8
Easy Tension	10	58.8
Fear	13	76.4
Insomnia	11	64.7
Intellectual changing	6	35.3
Depression condition	11	64.7
Somatic Disorder :		
Somatic	11	64.7
Sensory	15	88.2
Disorders :		
Cardiovascular	3	17.6
Respiration	2	11.8
Gastrointestinal	2	11.8
Urinary	9	52.9
Simpton automatically	7	41.2
Behavior changing	11	64.7

**Tabel 4. Anxiety Response of CKD Patients n= 17**

Anxiety Response	Mean	Median	(min-max)
Pre test	12.71	13	7-15
Post test	8.76	9	6-12

**Tabel 5. Differences in CKD Patients Anxiety Response n= 17**

Anxiety Response	Mean	difference	Z Tabel (α=5%)	Z Hitung	P Value
Pre test	12.71				
Post test	8.76	3.95	1.96	-3.425	0,001

### 7. References

Aggarwal, H.K., Jain.D., Dabas.G., Yadav, R.K. (2017). Prevalence of Depression, Anxiety and Insomnia in Chronic Kidney Disease Patients and their Co-Relation with the Demographic Variables. *Pril (Makedon Akad Nauk Umet Odd Med Nauki)*. 2017 Sep 1;38(2):35-44. doi: 10.1515/prilozi-2017-0020.

AhkariS, MoshkiM, BahramiM. (2014). The relationshipbetween social support andadherence ofdietaryandfluids

- restrictions among hemodialysis patients in Iran. *Journal of Caring Science*
- Ankrom, S (2008). Progressive muscle relaxation can help you reduce anxiety and prevent panic: what is progressive muscle relaxation  
<http://panicdisorder.about.com>
- Aucella, F., Valente, G.L., Catizone, L. (2014). The role of physical activity in the CKD setting. *Kidney blood pressure res* 2014;39:97-106. [http:// DOI: 10.1159/000355783](http://DOI:10.1159/000355783).
- Böhm, J., Monteiro, M.B., Thomé, F.S. (2012). Effects of aerobic exercise during haemodialysis in patients with chronic renal disease: a literature review. *J Bras Nefrol.* 2012 Jun;34(2):189-94. [http://www.scielo.br/scielo.php?script=sci\\_serial&pid=01012800&lng=en&nrm=iso](http://www.scielo.br/scielo.php?script=sci_serial&pid=01012800&lng=en&nrm=iso)
- Carly, J. W., Angela, C., Frank, H., Robin.H&Nina Smyth. (2015). Physical fitness and prior physical activity are both associated with less cortisol secretion during psychosocial stress. *Science and the Art of Caring* .Volume 23, 2015. Issue 5  
<http://www.tandfonline.com/toc/yppc20/current>.
- Chih, C.K., Yi Chieh.T., Heng-Jung Hsu., I Wen Wu., Chiao-Yin Sun., Chia-Chi Chou., Chin-Chan Lee., Chi-Ren Tsai., Mai-Szu Wu., Liang-Jen Wang. (2016). Depression and Suicide Risk in Hemodialysis Patients With Chronic Renal Failure. [http://www.psychosomaticsjournal.com/issue/S0033-3182\(10\)X7043-8](http://www.psychosomaticsjournal.com/issue/S0033-3182(10)X7043-8). Volume 51, Issue 6, Pages 528–528.e6
- Cintia O. Pellizzaro, Fernando S. Thomé&Francisco V. Veronese. (2013). Effect of Peripheral and Respiratory Muscle Training on the Functional Capacity of Hemodialysis Patients. *Renal Failure Journal.* Volume 35, 2013 - Issue 2. Pages 189-197. Received 06 Jul 2012. Published online: 30 Nov 2012.
- Corydon, H.D. (2014). Hypnosis in the treatment of anxiety and stress related disorders. *Expert Review of Neurotherapeutics.* Volume 10, 2010 - Issue 2. P263-273. <https://doi.org/10.1586/ern.09.140>
- Cresswell, J.W.(1998). *Qualitative Inquiry and Research Design Choosing Among*. Thousand Oaks:Sage
- David J. S., Robert.K., Bothwell&John C. B.(2008). The Effects of Hypnosis on Anxiety, Depression, Fatigue, and Sleepiness in People Undergoing Hemodialysis: A Clinical Report. *International Journal of Clinical and Experimental Hypnosis.* Volume 61, 2013 - Issue 4.P(55-68).
- David, J.R.,Robert.K.B &John C. B. The effects of hypnosis, context reinstatement, and anxiety on eyewitness memory. *International Journal of Clinical and Experimental Hypnosis.* Volume 45, 1997. Issue 1. Pages 55-68. <https://doi.org/10.1080/00207149708416106>
- DepKes RI. (2008). Riset kesehatan dasar tahun 2007. Jakarta:Depkes RI
- Fukunishi.I.,Kitaoka.T., Shirai.T.,Kino.K., Kanematsu. E., Sato.Y. (2002). Psychiatric Disorders among Patients Undergoing Hemodialysis Therapy. *Nephron* 2002;91:344–347 <https://doi.org/10.1159/000058418>
- Gibson.E.L.,Held. I.Khawnekar D.,Rutherford. P. (2016). Differences in Knowledge, Stress, Sensation Seeking, and Locus of Control Linked to Dietary Adherence in Hemodialysis Patients. *Front Psychol.* 2016 Nov 29;7:1864. eCollection 2016.
- González, D.J.L.N., Sánchez.R.S.M.L.E, Ostrosky, S.F., Alberú. J., García R.G., Marino,V.L.A.,McClintock,S.M. (2011). Assessment of emotional distress in chronic kidney disease patients and

- kidney transplant recipients. Rev Invest Clin. 2011 Nov-Dec;63(6):558-63. <http://clinicalandtranslationalinvestigation.com/>
- Haitham.E&Amr.M. (2015). Prevalence of sleep disorders among ESRD patients. Renal Failure. Volume 37, 2015 - Issue 6. Published online: 11 May 2015.
- Karin. C.,Phil. E.,Joana. F.V.,Gerardo, P&Gloria. G.B. (2015). The effect of progressive muscle relaxation on daily cortisol secretion. The International Journal on the Biology of Stress. Volume 18, 2015 - Issue 5. Published online: 15 Jul 2015.
- Kosmadakis, G.C., Bevington.A., Smith A.C., Clapp.E.L., Viana, J.L., Bishop, N.C., Feehally.J (2010). Physical exercise in patients with severe kidney disease. Nephron Clin Pract 2010;115:c7–c16. [http:// DOI:10.1159/000286344](http://doi.org/10.1159/000286344).
- Loureiro, A.C.T., de Rezende Coelho, M.C., Coutinho, F.B., Borges, L.H., Lucchetti. G.(2017). The influence of spirituality and religiousness on suicide risk and mental health of patients undergoing hemodialysis. Compr Psychiatry. 2017 Aug 26;80:39-45. doi: 10.1016/j.comppsy.2017.08.004
- Lukasz.S., Monica.V., Aimee C.F.&Martin A.K. (2014). Treatments for generalized anxiety disorder. Expert Review of Neurotherapeutics. Volume 4, 2004 Issue 2. P 285-294. <https://doi.org/10.1586/14737175.4.2.285>
- Martha, S., McCallie, B.S.W.,Claire M. B&Charlaine, J.H. (2006). Progressive Muscle Relaxation. Journal of Human Behavior in the Social Environment. Volume 13, 2006 - Issue 3.
- Maurícia, C.L., Camila, C.C., Kelly da Silva, C., A.F.J, Mariane, B.M.,&Alexandre, S.D.(2012). Effect of Exercise Performed during Hemodialysis: Strength versus Aerobic. Renal Failure Journal. Volume 35, 2013-Issue 5. Pages 697-704. Published online: 08 Apr 2013. <https://doi.org/10.3109/0886022X.2013.780977>.
- McKercher .C.,Sanderson. K., Jose MD.(2013). Psychosocial factors in people with chronic kidney disease prior to renal replacement therapy. Nephrology (Carlton). 2013 Sep;18(9):585-91. doi: 10.1111/nep.12138. <https://www.ncbi.nlm.nih.gov/pubmed/23876102>
- Micol.A.,Rona, M.M.,Fergus.C., CaskeyJoseph. C. (2014). Fatigue in advanced kidney disease. published online 2 April 2014. <http://dx.doi.org/10.1038/ki.2014.86>
- Moleong, C.L.,(2010). Metodologi penelitian kualitatif : edisi revisi. Bandung : PT Remaja Rosdakarya.
- Najafi, A., Keihani, S., Bagheri, N., Jolfaei A.G., & Meybodi A.M (2016). Association between anxiety and depression with dialysis adequacy in patient on maintenance hemodialysis. Iran j psychiatry behav sci. June;10 (2):e4962.<http://doi.org/10.17795/ijpbs-4962>.
- Nursalam., (2008). Konsep dan penerapan metodologi penelitian ilmu keperawatan : pedoman skripsi, tesis dan instrumen penelitian keperawatan. Jakarta : Salemba Medika
- Palmer, N.D., Sink, K.M., Smith, S.C., Xu.J., Bowden, D.W., Hugenschmidt, C.E., Whitlow, C.T., Williamson, J.D., Maldjian, J.A., Divers, J., Freedman, B.I. (2014). Kidney disease and cognitive function: african american-diabetes heart study mind. American journal of nephrology. Am J Nephrol 2014;40:200–207. [http:// DOI:10.1159/000367669](http://doi.org/10.1159/000367669).
- Pollit, D.F, Beck,C.T., & Hungler, B.P (2006). Essential of nursing research. Methods appraisal and utilization (6<sup>th</sup> ed).

- Philadelphia: Lippincott. Williams & Wilkins.
- Rebollo, R.A., Morales Asencio, J.M., Eugenia P.R.M. (2017). Depression, anxiety and health-related quality of life amongst patients who are starting dialysis treatment. *J Ren Care*. 2017 Jun;43(2):73-82. doi: 10.1111/jorc.12195. Epub 2017 Feb 27.
- Robert, M.C. (2016). Clinical Applications of Relaxation Training. Hospital Practice. Volume 18, 1983 - Issue 7 . Pages 83-94. Published online: 17 May 2016.
- Shafi, S.T., Shafi.T. (2017). A comparison of anxiety and depression between pre-dialysis chronic kidney disease patients and hemodialysis patients using hospital anxiety and depression scale. *Pak J Med Sci*. 2017 Jul-Aug;33(4):876-880. <http://doi: 10.12669/pjms.334.12656>.
- Smeltzer, S.C., Bare, B.G., Hinkle, J.L., Cheever, K.H. (2008). Brunner & Suddarth's Textbook of medical-surgical nursing, (11th edition).
- Snyder, M & Lindquist, R. (2006). Complementary/alternative therapies in nursing. Fifth edition. Springer Publishing Company.
- Speziale, H.J.S., & carpenter, D.R., (2003). Qualitative research in nursing : Advancing the humanistic imperative. 3<sup>rd</sup> edition. Philadelphia : Lippincott Williams & Wilkins
- Stasiak, C.E, Bazan, K.S, Kuss, R.S., Schuinski AF., Baroni G. (2014). Prevalence of anxiety and depression and its comorbidities in patients with chronic kidney disease on emodialysis and peritoneal dialysis. *J Bras Nefrol*. 2014 Jul-Sep;36(3):325-31.
- Streubert, H.J & Carpenter, D.R (2003). Qualitative Research In Nursing : Advancing The Humanistic Imperative. Lippincott Williams & Wilkins : Philadelphia
- Stuart, G.W & Laraia, M.T. (2005). Principles and practice of psychiatric nursing. (8<sup>th</sup> ed). St. Louis: Mosby.
- Sudoyo AW, Setiyohadi B, Alwi I. (2010). Buku ajar ilmu penyakit dalam (5th ed).
- Tóthová, L., Bábíčková, J., Borbélyová V., Filová B., Šebeková, K., Hodosy, J. (2015). Chronic renal insufficiency does not induce behavioral and cognitive alteration in rats. *Physiol Behav*. 2015 Jan;138:133-40. doi: 10.1016/j.physbeh.2014.10.027. Epub 2014 Oct 31.
- Valsaraj, B.P., Bhat, S.M., Latha, K.S. (2016). Cognitive Behaviour Therapy for Anxiety and Depression among People Undergoing Haemodialysis: A Randomized Control Trial. *J Clin Diagn Res*. 2016 Aug;10(8):VC06-VC10. <http://doi: 10.7860/JCDR/2016/18959.8383>. Epub 2016 Aug 1
- Vasilopoulou, C., Bourtsi, E., Giaple, S., Koutelekos, I., Theofilou, P., & Polikandriou, M. (2016). The impact of anxiety and depression on the quality of life of hemodialysis patients. *Global journal of health science*, vol.8. No.1;2016. <http://dx.doi.org/10.5539/gjhs.v8n1p45>.
- Wilson LM. Gagal Ginjal Kronik, (2006). In: Price, Wilson, editor. Patofisiologi Jilid III. Jakarta: ECG.
- Xiaojun Zhao , Xuqun Anda , Changxiu Shi & Shuoqi Gan. (2015). Behaviour & Information Technology . Volume 34, 2015 - Issue 6.