



A STUDY TO ASSESS THE EFFECTIVENESS OF ACUPRESSURE ON PAIN REDUCTION DURING NEEDLE INSERTION IN ARTERIOVENOUS FISTULA AMONG HEMODIALYSIS PATIENTS IN SELECTED HOSPITAL AT DELHI NCR

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ABSTRACT:

Background

Hemodialysis (HD) is the most frequently used renal replacement therapy with the Arteriovenous Fistula (AVF) being the "Gold Standard" for vascular access in hemodialysis (HD) patients. Chronic Kidney disease involves progressive, irreversible loss of kidney function. It is defined as either the presence of kidney damage or Glomerular filtration rate (GFR) <60 ml/min for 3 months or longer dialysis or a kidney transplant is required to survive.

Aim- The objectives of the study is to assess the effectiveness of acupressure on reducing pain during needle insertion in arteriovenous fistula among hemodialysis patients in experimental group.

Materials and methods: A quantitative research approach, quasi experimental with post-test only control group design and non-probability purposive sampling technique was adopted with 60 samples. The sample consist of 60 dialysis patients with AV fistula (Experimental group 30 hemodialysis patients with AV fistula and Control group 30 hemodialysis patients with AV fistula). In the experimental group acupressure was given 2 mins before the insertion of the needle and during the insertion and post-test was done by using Numerical Rating Pain Scale.

In the control group no acupressure was given and post test was done by using Numerical Rating Pain Scale. The assessment tool was Numerical Rating Pain Scale. The statistical analysis was done by 't' test and fisher's exact test.

Result: Data obtained was analyses and result showed that in experimental group, the post-test majority of patient's 21(70%) were having mild pain and 9(30%) were having moderate pain. Whereas in control group the post-test majority of patient's 22(73.33%) were having severe pain and 8(26.66%) were having moderate pain. The mean pain score of experimental group 2.6. Whereas the mean pain score of control group 7.3. The mean difference of needle insertion in AV fistula pain score of experimental group and control group was 4.7. This indicates that the mean pain score of experimental group is lower than the mean pain score of control group. The obtained mean difference was found to be statistically significant. The calculated "t" value is 16.78 which is greater than the table value at 0.05 level of significance for df (58).

Conclusion: The study concluded that acupressure is effective in reducing pain during needle insertion in arteriovenous fistula among hemodialysis patients.

KEYWORDS:

ACUPRESSURE, ARTERIOVENOUS FISTULA, HEMODIALYSIS PATIENTS.

INTRODUCTION

"If you can sit with your pain, listen to your pain and respect your pain—in time you will move through your pain."³⁴

Bryant McGill

Pain is one of the most frequent complaints of patients during Arteriovenous fistula vein puncture. Pain inflicted by insertion of large cannula into Arteriovenous fistula on regular hemodialysis is a significant cause of concern for patients. Pain is unpleasant sensory and emotional

experience associated with actual or potential damage of tissue with physiological or psychological responses.

NEED FOR STUDY

"The art of life is the art of avoiding pain" -Thomas Jefferson³⁵

According to the **World Health Organization (WHO)** Global Burden of Disease Project, disease of the kidney and urinary tract contribute to approximately 8,50,000 death every year.

WHO estimates that chronic kidney disease is the 12th

leading cause of death and 17th cause of disability. In India, the projected number of deaths due to chronic kidney disease will rise from 3.78 million in 1990 to an expected 7.63 million in 2020. The treatment modalities for End Stage Renal Disease are hemodialysis, peritoneal dialysis and renal transplantation. Vascular accesses for hemodialysis are Arteriovenous fistula, Arteriovenous graft which are permanent access and venous catheter which is a temporary access. On an average, a patient on maintenance hemodialysis undergoes ten arteriovenous fistula punctures a month and would continue to do so throughout their life time or until a successful renal transplant. Patients comfort with the procedure is therefore of utmost important for long-term compliance with the treatment.

In September 2008, the **World Health Organization (WHO)** estimated that nearly 80% of the population in the world has either insufficient or no access to moderate or severe pain treatment. Every year millions of people around the world suffer from pain without sufficient treatment. Patients undergoing HD are repeatedly exposed to pain due to insertion of large gauge needle into the fistula.

Patients with end-stage renal disease undergoing hemodialysis are repeatedly exposed to pain from approximately 300 punctures per year to their AV fistula associated with the insertion of large-gauge needles. Nurses play a pivotal role in pain assessment and intervention. The complementary therapies are used to relieve the symptoms of pain.

Among suitable methods for pain relief, acupressure can be noted. Acupressure is a complementary therapy dating 5000 years ago. This form of treatment developed from traditional Chinese medicine and is considered today in most parts of the world. Based on that, the health outcome of the balance of vital life force through 14 channels called meridians in the body is turning.

Hugo, one of the pressure points on the meridians of the large intestine (LI4) called this point in the back of the hand, between the first and second meta carpal bone. Today, there are several studies on the impact of Hugo and its effect on reducing labour pain, nausea and vomiting caused by chemotherapy, fatigue and relief of pain in other cases. Acupressure has many advantages, such as being non-invasive, does not require special tools, affordable, and convenient to the patient's education.

PROBLEM STATEMENT

A STUDY TO ASSESS THE EFFECTIVENESS OF ACUPRESSURE ON PAIN REDUCTION DURING NEEDLE INSERTION IN ARTERIOVENOUS FISTULA AMONG HEMODIALYSIS PATIENTS IN SELECTED HOSPITAL AT DELHI NCR

OBJECTIVES

- To assess the effectiveness of acupressure on reducing pain during needle insertion in arteriovenous fistula among hemodialysis patients

in experimental group.

- To determine the association between level of pain during needle insertion in arteriovenous fistula among hemodialysis patients, in control group with selected demographic variables.
- To determine the association between level of pain during needle insertion in arteriovenous fistula among hemodialysis patients, in experimental group with selected demographic variables.

HYPOTHESIS

- H1-** There will be significant reduction in level of pain during needle insertion in arteriovenous fistula among hemodialysis patients in the experimental group as measured by numerical rating scale at 0.05 level of significance.
- H2-** There will be significant association between level of pain during needle insertion in arteriovenous fistula among hemodialysis patients in the control group with selected demographic variables at 0.05 level of significance.
- H3-** There will be significant association between level of pain during needle insertion in arteriovenous fistula among hemodialysis patients in the experimental group with selected demographic variables at 0.05 level of significance.

METHODOLOGY

RESEARCH APPROACH- Quantitative Research Approach

RESEARCH DESIGN- Quasi Experimental With Post-test Only Control Group Design.

VARIABLE

Independent Variables- Acupressure

Dependent Variables- Pain During Needle Insertion In Av Fistula

SAMPLE AND SAMPLE SIZE - Total 60

Experimental-30

Control -30

POPULATION- Patients Undergoing Needle Insertion In Arteriovenous Fistula

SETTING OF THE STUDY- Selected Hospital In Delhi Ncr

SAMPLING TECHNIQUE- Non-Probability Purposive Sample Technique

DATA COLLECTION TOOL AND TECHNIQUE

- Demographic Variable
- Standardized Numerical Rating Scale

CRITERIA FOR SAMPLE SELECTION

INCLUSION CRITERIA

- Both Male and Female Patient
- Patient willing to participate in the study.

- Patient having AV fistula.

EXCLUSION CRITERIA

- Patients not willing to participate in the study.
- Patients who are chronically ill.

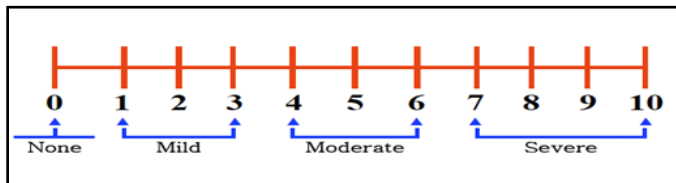
DESCRIPTION OF TOOL:

TOOL - 1: DEMOGRAPHIC DATA

It consists of age, gender, educational qualification, occupation, family history, duration of taking hemodialysis, duration of use of AV fistula, previous exposure of AVF puncture, taking any analgesic medicine.

PART -2: NUMERICAL RATING PAIN SCALE

Numerical Rating Pain Scale for pain which is used to assess the level of pain during needle insertion in arteriovenous fistula among hemodialysis patients. A four-point scale (none, mild, moderate, severe) were provided to record the response after intervention.



ETHICAL CLEARANCE: Ethical clearance was obtained from Nightingale Institute of Nursing, Noida, UP, India.

PLAN FOR DATA ANALYSIS

The data collected was analyzed through descriptive and inferential statistics. including 't'- test and fisher exact test.

RESULT & DISCUSSION

Section I- Frequency and percentage distribution of patient undergoing needle insertion in AV fistula of demographic variables.

- Considering the age in experimental group revealed that maximum of sample i.e. 15 (50%) patients were in the age group of 51-60 years, 6(20%) were in age group 41-50 years and 5(16.66%) were in age group 31-40 years and 4(13.33%) were in the age group 20-30 years. Whereas In control group it was maximum of the sample 15 (50%) patients were in the age group of 41-50 years, 6(20%) were in age group 51-60 years and 5(16.66%) were in age group 31-40 years and 4(13.33%) were in the age group 20-30 years.
- Regarding the gender in experimental group maximum of the sample i.e., 21 (70%) patients were male and 9(30%) were female. Whereas in control group maximum of the sample 16 (53.33%) patients were female and 14(46.66%) were male
- In experimental group maximum educational qualification of the sample i.e.18(60%) patient had degree, 5(16.66%) patients had diploma,

5(16.66%) patients had other qualifications, and 2 (25%) patients had no formal education. Whereas in control group maximum of the sample i.e.11(36.66%) patient had diploma, 8(26.66%) patients had degree, 7(23.33%) patients had other qualifications, and 4 (13.33%) patients had no formal education.

- In experimental group majority of the sample i.e.14(46.66%) patients had other occupation,6(20%) patients were government employees,6(20%) patients had own business, and 4(13.33%) patients had private job. Whereas in control group majority 15(50%) patients had other occupation,5(16.66%) patients were government employees, had own business, and had private job.
- In experimental group majority of the sample i.e. 26(86.66%) patients had no family history of kidney disease, and 4(13.33%) patients had family history of kidney disease. Whereas in control group majority of 26(86.66%) patients had no family history of kidney disease, and 4(13.33%) patients had family history of kidney disease.
- Considering the duration of taking hemodialysis in experimental group majority of sample i.e. 15(50%) patients were taking hemodialysis for 1-2 years ,10 (33.33%) patients were taking hemodialysis for 3years and above, 4 (13.33%) for 2-3 years, and 1(3.33%) for less than 1 year. Whereas in control group majority of 9(30%) patients were taking hemodialysis for 1-2 years, 9(30%) patients were taking hemodialysis for 2-3 years, 6(20%) patients 3years and above, 6 (20%) patients for less than 1 year.
- Considering the duration of use of AV fistula in experimental group majority of sample i.e., 13(43,33%) patients were using fistula for 1-2 years,10 (33.33%) was using AV fistula for 3 years and above, 4(13.33%) were using for 2-3 years and 3(10%) patients were using for less than 1 year. Whereas in control group majority of 9(30%) patients were using fistula for 2-3 years,8 (26.66%) was using AV fistula for less than 1 year, 7(23.33%) were using for 1-2 years and 6(20%) patients were using for 3 years and above.
- Considering the previous experience of AV fistula puncture in experimental group all 30 (100%) had previous experience of AV fistula puncture. Whereas in control group also all patients 30 (100%) had previous experience of AV fistula puncture
- Considering taking any analgesic in experimental group all 30 (100%) were not taking any analgesic. Whereas in control group also all patients 30 (100%) had previous experience of AV fistula puncture

SECTION II-FREQUENCY AND PERCENTAGE DISTRIBUTION OF POST-TEST SCORE OF PAIN ASSESSMENT DURING NEEDLE INSERTION IN AV FISTULA IN EXPERIMENTAL GROUP AND CONTROL GROUP

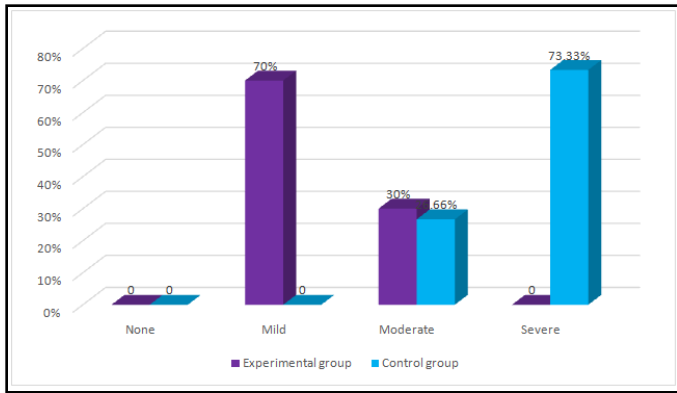


FIGURE 14: BAR DIAGRAM SHOWING DISTRIBUTION OF POST TEST SCORE OF PAIN ASSESSMENT DURING NEEDLE INSERTION IN AV FISTULA IN EXPERIMENTAL GROUP AND CONTROL GROUP.

Data presented revealed that in experimental group, the post-test majority of patient’s 21(70%) were having mild pain and 9(30%) were having moderate pain. Whereas in control group, in post-test majority of patient’s 22(73.33%) were having severe pain and 8(26.66%) were having moderate pain.

Hence the intervention (acupressure) was effective in reducing pain during needle insertion in arteriovenous fistula among hemodialysis patients.

SECTION III-MEAN, MEAN DIFFERENCE, STANDARD DEVIATION AND “T” VALUE OF EFFECTIVENESS OF ACUPRESSURE ON PAIN REDUCTION DURING NEEDLE INSERTION IN ARTERIOVENOUS FISTULA AMONG HEMODIALYSIS PATIENTS.

Sl no	Mean	Mean Difference	SD	‘t’ Value
Experimental group post-test	2.6	4.7	1.13	16.78
Control group post-test	7.3		1.12	

df (58)

- Table shows the mean pain score of experimental group 2.6. Whereas the mean pain score of control group 7.3. The mean difference of needle insertion in AV fistula pain score of experimental group and control group was 4.7. This indicates that the mean pain score of experimental group is lower than the mean pain score of control group. The

obtained mean difference was found to be statistically significant.

- The calculated “t” value is 16.78 which is greater than the table value at 0.05 level of significance for df (58).
- Hence, null hypothesis H01 was rejected and research hypothesis was accepted. It is concluded that the acupressure was effective on pain reduction among patients undergoing needle insertion in arteriovenous fistula.

SECTION IV:

- finding related to association between level of pain among patients undergoing needle insertion in av fistula in control group with selected demographic variables
- finding related to association between level of pain among patients undergoing needle insertion in av fistula in experimental group with selected demographic variables

It was found from the fisher’s exact test there was no significant association between level of pain among patients undergoing needle insertion in AV fistula in both the groups with demographic variables age, gender, educational qualification, occupation, family history of kidney disease, duration of taking hemodialysis, duration of use of AV fistula, previous experience of AV fistula puncture, taking any analgesic medication were found non- significant which shows there is no significant association between post test score with these variables as the ‘P’ value obtained is greater than 0.05. Hence, null hypothesis is accepted research hypothesis is rejected

CONCLUSION

The present study assessed the effectiveness of acupressure on patients undergoing needle insertion in arteriovenous fistula. Majority of patients 21(70%) were having mild pain and 9(30%) were having moderate pain after applying acupressure. Acupressure was effective in reducing pain during needle insertion in arteriovenous fistula among hemodialysis patients.

IMPLICATIONS

NURSING PRACTICE

The findings of the study clearly point out that acupressure intervention is effective in pain during needle insertion in arteriovenous fistula among hemodialysis patients. The reduction of level of pain during AV fistula puncture among patients undergoing hemodialysis has an important role to play in enabling effectiveness of acupressure intervention as an independent nursing intervention.

This can be facilitated by motivating the nurses to

Learn accurate assessment of level of pain during AV fistula puncture with Standardized Numerical Rating Pain Scale.

Develop sensitivity to the effects of acupressure on reduction of level of pain among patients undergoing

hemodialysis.

Understand the importance of acupressure technique intervention as an adjunct to the Pharmacological therapy.

Encourage peer on use of acupressure intervention as a form of diversion among the patients undergoing hemodialysis.

Encourage the use of acupressure intervention for reduction of level of pain during Arteriovenous fistula puncture.

Nurses play a vital role in taking care of patients who undergo haemodialysis. By giving acupressure in arterio venous fistula puncture pain as a routine care will reduce the pain.

NURSING EDUCATION

Student's interest in Nursing research should be emphasized to update their knowledge and practice in Nursing Profession.

Ensure that nurses learn the assessment of pain and effectiveness of acupressure intervention in reduction of level of pain during Arteriovenous fistula puncture as an independent nursing intervention.

Provide adequate exposure to the nurses, where acupressure is used in reducing the level of pain during Arteriovenous fistula puncture.

Nurses should take more responsible role in management of patients with AV fistula at hospital.

Through In- Service education nurses can become better equipped to understand and assist the group about the benefits of acupressure.

Nurses also need to serve as a system and community agent to educate other professional and general public.

NURSING ADMINISTRATION

Nurse administrator should take the major role of acupressure on arteriovenous fistula puncture pain among patients on hemodialysis

The nursing administrator should supervise the intervention done for the patients by nurses and also monitor the standards of practice to promote excellence in nursing care.

The Nurses administration should plan to conduct awareness programme for hemodialysis patient and their relatives about the acupressure as a management of pain.

Nurse administration should develop teaching material and self-instructional modules related to pain management among hemodialysis patient.

This would enable the nurse to update their knowledge and skills to improve the quality of care among dialysis patients.

NURSING RESEARCH

The study provides base line data for conducting other research studies.

The study will be motivation for budding researchers to

conduct a same study on larger scale.

Adequate knowledge, motivation and encouragement by the management and authorities of the organization can enable various research activities.

This could be the quest of many novice nurses, when motivated to indulge in research activity could improve the body of knowledge of the profession.

The findings of the study help the professional nurses to develop enquiring by providing a base.

This study helps the nurse's researcher to develop insight into development of teaching module and material towards the promotion of health.

The further research work can be conducted with every medical condition, to identify most effective pain strategies.

CONFLICT IN THE STUDY: None

SOURCE OF FUNDING: self-funded research study.

REFERENCES

BOOK REFERENCES:

1. Sharma S.K, "Nursing Research and Statistics" 8nd edition, Elsevier publisher, New Delhi 2011.p.30, 93,125
2. Sharma S.K, "Nursing Research and Statistics" 3rd edition, Elsevier publisher.p.117
3. Treece and Treece, "Elements of research in nursing" 4th edition, Philadelphia Mosby publisher 1986.p. 95-98
4. Basavanthappa BT, "Essentials of Nursing Research", 1st edition, Jaypee Brothers Medical Publishers.
5. Burns N and Grove S.K, "Understanding Nursing research. 4th edition. Elsevier publication, New Delhi 2007. P. 381
6. Polit Denis F, Beck Chery Tatano, "Essential of Nursing Resarch" 7th edition, New Delhi: Wolters Kulwer Pvt Ltd :2010. p, 177,222,338,377
7. Suddharth and Brunner, "Medical Surgical Nursing" 11th edition New Delhi Wolters Kulwer,2011 p,1285,1286,1287
8. Lewis's Medical-Surgical Nursing;3rd South Asia Edition; Adaptation Editors :Chintamani and Mrinalini Mani ;Copyright 2018 by RELX India Pvt. Ltd; Page no 184-220

JOURNAL REFERENCES:

9. K R, SJ N, R R. Association between symptom experiences with bio-physiological parameters of haemodialysis patients during AV-fistula cannulation. *Trends in Medicine*. 2019;19(1).
10. Figueiredo A, Viegas A, Monteiro M, Poli-de-Figueiredo C. RESEARCH INTO PAIN PERCEPTION WITH ARTERIOVENOUS FISTULA (AVF) CANNULATION. *Journal of Renal Care*. 2008;34(4):169-172.
11. Montero RC, Arellano FR, Abad MD, Gómez AM, Galán MI. Pain degree and skin damage during arterio-venous fistula puncture. *EDTNA-ERCA Journal*. 2004 Oct 12;30(4):208-12.
12. Béfa Noto Kadou Kaza, Kossi Akomola Sabi, Eyram Yoan Makafui Amekoudi, Ghislain Imangue, Jacques Badibanga, Claude Mawufemo Tsevi, Aminata Yasminatou Bikinga Wendkuuni, Denis Georges Teuwafeu, Mohamed Gharbi Benghanem, Benyounes Ramdani. Pain during Arterio-Venous Fistula (AVF) Cannulation. *American Journal of Internal Medicine*. Vol. 2, No. 5, 2014, pp. 87-89. doi: 10.11648/j.ajim.20140205.12
13. da Silva O, Rigon E, Corradi Dalazen J, Bissoloti A, Rabelo-Silva E. Pain during Arteriovenous Fistula Cannulation in Chronic Renal Patients on Hemodialysis. *Open Journal of Nursing*. 2016;06(12):1028-1037.
14. *Internationaljournalofcaringsciences.org*. 2022 [cited 4 March 2022]. Available from: [http://internationaljournalofcaringsciences.org/docs/37_kilic_original_11\)3.pdf](http://internationaljournalofcaringsciences.org/docs/37_kilic_original_11)3.pdf)
15. Alavi N. Effectiveness of acupressure to reduce pain in intramuscular injections. *Acute Pain*. 2007;9(4):201-205.
16. Hjelmstedt A, Shenoy S, Stener-Victorin E, Lekander M, Bhat M, Balakumaran L et al. Acupressure to Reduce Labor Pain. *Obstetric Anesthesia Digest*. 2011;31(3):190-191.
17. Chen Y, Wang H. The Effectiveness of Acupressure on Relieving Pain: A Systematic Review. *Pain Management Nursing*. 2014;15(2):539-550.
18. Z S, H T. Effect of acupressure (UB32) on pain intensity in intramuscular injections [Internet]. *PubMed*. 2022 [cited 4 March 2022]. Available from: <https://pubmed.ncbi.nlm.nih.gov/24554956/>
19. Sharif Nia H, Pahlevan Sharif S, Yaghoobzadeh A, Yeoh K, Goudarzian A, Soleimani M et al. Effect of acupressure on pain in Iranian leukemia patients: A randomized controlled trial study. *International Journal of Nursing Practice*. 2017;23(2):e12513.
20. Sakhaei S, MOTAAREFI HO, Sadagheyani HE. Comparing the effect of ice massage and acupressure on the intensity of the venipuncture pain in hemodialysis patients. *Int J Pharma Bio Sci*. 2018 Jan;9(1):164-70.
21. Murphy SL, Harris RE, Keshavarzi NR, Zick SM. Self-administered acupressure for chronic low back pain: a randomized controlled pilot trial. *Pain Medicine*. 2019 Dec 1;20(12):2588-97.
22. Pouy S, Khorasgani AE, Azizi-Qadikolaee A, Yaghobi Y. Effect of acupressure on post tonsillectomy pain in adolescents: A randomized, single-blind, placebo-controlled trial study. *International Journal of Adolescent Medicine and Health*. 2019 Jul 9.
23. Shady RH, Seada AI, Mostafa MF. Effectiveness of acupressure in the reduction of pain and anxiety among patients with open thoracotomy. *American Journal of Nursing*. 2020 Feb 1;8(2):182-91.
24. Şolt Kirca A, Kanza Gul D. The effect of acupressure applied to points LV4 and LI4 on perceived acute postpartum perineal pain after vaginal birth with episiotomy: a randomized controlled study. *Archives of gynecology and obstetrics*. 2020 Feb;301(2):473-81.
25. Shiatsu Therapy Association of Australia - Research (staa.org.au)
26. Susana CT, Maria TM, Pilar DS, María MM, Pilar MS, Valentín MG. Effectiveness of self-applied acupressure for cervical pain of benign origin (EDIDO-CUH): a randomized controlled clinical trial. *Acupuncture in Medicine*. 2021 Oct;39(5):441-51.
27. Adams A, Eschman J, Ge W. Acupressure for chronic low back pain: a single system study. *Journal*

of Physical Therapy Science. 2017;29(8):1416-20.

28. Borzou SR, Akbari S, Fallahinia GH, Mahjub H. The effect of acupuncture at the point of hugo on pain severity of needle insertion in arteriovenous fistulas in hemodialysis patients. Hypertension. 2017;12:34-.

NET REFERENCE:

29. <https://pubmed.ncbi.nlm.nih.gov/17388768/>

30. <https://www.sciencedirect.com/science/article/pii/S1875459710600185>

31. <https://www.researchgate.net/publication/317101706>

32. <https://pubmed.ncbi.nlm.nih.gov/30538941/>

33. <https://medcraveonline.com/JDHODT/JDHODT-10-00495.pdf>

34. Quote by Bryant McGill: "If you can sit with your pain, listen to your p..." (goodreads.com)

35. the art of life is the art of avoiding pain - Bing images