ISSN CETAK : 2541-2640
ISSN ONLINE : 2579-8723

THE EFFECTIVENESS OF PANDAN LEAVES BOILD ON THE PAIN LEVEL OF PATIENTS WITH HERNIA NUCLEUS PULPOSUS (HNP) DISEASE AT POLYCLINIC OF PMC HOSPITAL

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ABSTRAK

Hernia Nukleus Pulposus (HNP) diderita oleh sebagian besar wanita dewasa dan lanjut usia di Indonesia. Salah satu dampak dari penyakit ini adalah gangguan mobilitas fisik akibat nyeri yang berulang. Rata-rata pasien HNP bergantung pada obat analgesik kimiawi yang dikhawatirkan akan berdampak pada organ tubuh lainnya jika dikonsumsi setiap hari. Daun pandan merupakan salah satu tanaman lokal Indonesia yang mudah ditemukan dan memiliki efek analgetik untuk membantu mengurangi rasa nyeri. Penelitian ini merupakan penelitian eksperimental semu (Quasy Experimental Research) dengan menggunakan rancangan The non-equivalent group design. Sampel penelitian ini berjumlah 30 orang, dengan menggunakan teknik purposive sampling. Dalam pelaksanaan penelitian ini, dilakukan pre-test dan post-test untuk mengukur tingkat nyeri responden sebelum dan sesudah perlakuan, kemudian diberikan intervensi rebusan daun pandan wangi sebanyak 1x sehari selama 3 hari pada kelompok eksperimen, selanjutnya pada kelompok kontrol untuk mengurangi nyeri peneliti melatih teknik nafas dalam dan panduan imagery. Uji analisis membandingkan rata-rata tingkat nyeri menggunakan Wilcoxon dan Mann-Whitney. Hasil dari penelitian ini didapatkan nilai Pvalue kelompok eksperimen adalah: 0,001, dan Pvalue kelompok kontrol adalah: 0,18. Kemudian dilakukan uji Mann-Whitney dan didapatkan nilai pvalue: 0,0001.Dari hasil penelitian ini dapat disimpulkan bahwa rebusan daun pandan wangi efektif dalam menurunkan nyeri pada pasien HNP. Dengan adanya penelitian ini, diharapkan perawat di masyarakat dapat mensosialisasikan rebusan daun pandan kepada pasien HNP.
Kata kunci : Daun Pandan 1; Tingkat Nyeri 2; Hernia Nukleus Pulposus 3; Obat Herbal 4

Abstract

Hernia Nucleus Pulposus (HNP) suffered by most mature and elderly women in Indonesia. One effect of this disease is physical mobility disorder due to recurring pain. The average of HNP patient depends on he chemical analgesic drugs, which are feared impacting other organs when it consumes every day. Pandan leave is one easy loacal indonesian plants to find and own the analgetic effect to help reduce the pain. This research was a Quasy Experimental Research using The non-equivalent group design. The sample of this research in amount of 30 people, using purposive sampling technique. In implementing this research, pre-test and post-test were conducted to measure the level of pain by the respondent before and after the treatment, then intervention of pandan leaves decoction were given 1x a day and given in 3 days in experimental group, then in control group to reduce the pain researcher train them the deep breath technique and imagery guidance. Analysis test comparing the average pain level using Wilcoxon and Mann-Whitney.The result of this study obtained Pvalue of experimental group are : 0,001, and Pvalue of control group are: 0,18. Then man-whitney test were conducted and obtained

pvalue: 0,0001. From the result of this research, it can be concluded that pandan leaves decoction is effective in reducing the pain of HNP patient. With this study, it is hoped that the nurses in community can socialize this pandan leaves decoction to HNP patient.

***Keywords** : Pandan Leaves 1; Pain Level 2; Hernia Nucleus Pulposus 3; Herbal Medicine 4*

BACKGROUND

a. Background

Based on the data gained from WHO that persistent pain symptomps are faced by many people in developing countries, around 33% of all population. For the United Kingdom countries the effect of back pain could cause paralysis where the number of the incident reached 1.1 million of 17.3 million from people who suffering back pain. Then in America, lower back pain suffered by adults in amount 26% by attack at least once a day in duration of 3 months (Kumbea et al., 2021 in (1)). Hernia Nucleus Pulposus in a condition where protrusion of the intervertebral disc causes pressure on the spinal cord which can cause pain and disturbing activities (2). The most dominating factor affecting the Hernia Nucleus Pulposus (HNP) is intrinsic factors such as age, degenerative process, weight, medical history, and gender (3).

Based on research conducted by Deyo and Mirza (2016) in the journal of Herniated Lumbar Intervertebral Disk stated that 81% patient of Hernia Nucleus Pulposus (HNP) could heal without surgery after a year. MRI result showed shortening of most herniated disk over time, and up to 76 % partially or completely healed in a year. However, recurrence often happen. In one research involving cohort of people with low back pain, 25% had recurrence symptoms in a year. HNP diagnosed based on patient history, clinical symptoms within 1 year. HNP is diagnosed based on patient history, clinical symptoms, and phisical checking (4). Another study found that high pain intensity, high number of dermatome deficits, long duration of symptoms, positive cross SLRT, and low level of miscle strength were linked to the failure of conservative treatment of HNP cases (5).

Patient wwith HNP usually come with general complaint of pain in their lower back. This perception of pain aims to restrict the movement of the muscle of the back. This restriction of movement caused by muscle spasm, as it an effort to protect againt injury or more severe lesion that might occur. Muscle spasm will cause a symptoms that decrease the flexibility of the back and spine. The pain is not only unpleasant sensation, but also affect almost every aspect of the lives of the HNP patient such as daily life activities, emotions, and social ineractions. This is in line with the research stated that pain intensity relates to quality of life, physical function, role function due to physical problems, social function, vitality, body pain, mental health, and general health perceptions of lumbar HNP patients (6).

In a study of pain conducted by WHO, it was found that 33% of the population developing countries suffering persistent pain. This pain will leads to depression that affect the quality of life and reduce the activity level of he workers ((WHO, 2013) in (7)). The prevalence of HNP is 1-2 % of the world's population in general, HNP can happen at all level of vertebral start from cervical to spinal, 80 % of HNP is lumbal HNP and 20% of HNP (8). The prevalence of lower back pain in Indonesia is predicted into range of 7.6% and 37% (9). The incidence if HNP is about 5 to 20 cases per 1000 adults every year and mostly happen to people in the third to fifth decade of life, with a male to female ration of 2:1 (10).

Pandan (Pandanus amaryllifolius Roxb.) is a tropical plants of Pandanaceae family in screw pine genus. Pandan leave often called screw pine, as it pineapple-like nature with spiral structure of long, narrow, and strap-shaped green leaves (11). Pandan leaves are known for their distinctive aroma as it frequently use as natural coloring for various types of food. Besides, pandan leaves also have potential in disease therapy, the leaves could heal smallpox, headaches, fever, arthritis, headache dental problems, and others (12). Pandan leaves can be used as the source of therapeutic

ISSN CETAK : 2541-2640
ISSN ONLINE : 2579-8723

value to various disease and own potential benefits for the devevlopment of better medicine product (13). Pandan also reduce the risk of disesase including degeneration, cardiovascular of cancer (14).

The benefits of pandan leaves is proven by research which revealed that pandan leaves contain various active components that are believed to be able to relieve joint pain symptoms and arthritis (15). Ethanol extract of pandan leaves contains quercetin which has anti-inflamatory characteristics (16). Based on the result of the research on the analgesic activitytest of ethanol extracts of fragrant pandan leaves againts female white mice by using writhing test method, it is shows that fragrant pandan leaves extract ar doses of 420 mg/kgBB and 840 mg/kgBB of mice could reduce the number of of writhing respond with a protection percent of 66% and at a dose of 1600 mg/kgBB mice with a protection percent of 74% (17). Pharmalogical activities reported by scientist are anti-microbial, anti-diabetic, analgesic, and neuroprotective (18).

Based on preliminarary survey conducted by researchers on 5 patients with HNP disease at PMC Hospital, it was found that those 5 patients were still relying on doctor's drugs to reduce their pain. Whereas the consumption of anti-pain medication for a long-term period are feared to damage patient's kidneys. From this background, then researcher eager to conduct a research to investigate the effectiveness of pandan leaf decoction on the pain level of patients with HNP at the PMC Hospital Polyclinic.

b. State Of The Art

The problem often experienced by patienta with Hernia Nucleus Pulposus is persistent pain. The pain affecting patient's daily activities as the life quality of the HNP patient decreased. Pharmacological therapy patients are given NSAIDs as pain relievers, and Corticosteroids as anti-inflammatory (4). Long-term consumption of analgesic drugs is not recommended as suitable herbal treatment is need to be considered the replacement. This research was planned as several previous research, such as a research of Aziza (2017) and Widyastiwi (2018) which stated that fragrant pandan leaves extract has an effect as an analgesic. Pandan leaves have been widely used as medicine, such as research from Ningsih, et. al (2018) (19) which stated thatpandan leaves have antihyperuricemia. However, no research conducted to investigate the effect of pandan leaves in reducing the pain level of HNP patient.

c. The hypothesis of this research is that pandan leaves decoction is effective in reducing the pain level of patients with HNP..

METHOD

This research use quantitative problem solving approach using the Quasy Eksperimental method. This Quasy Eksperimental research aims to find out variables involving control groups and experimental groups. The design of this research is The non-equivalent group design, as Both experimental and control groups will be tested using the same instrument and will be analyzed which treatment is more optimal between the two groups. In this study, the researcher aims to determine how the effectiveness of pandan leaves on the pain level of patients with HNP, using an experimental group and a control group.

a. Population dan sample

The population of this study were all patients with HNP who were undergoing treatment at PMC Hospital. The number of samples in this study were 30 people, using purposive sampling technique to obtain data.

b. The steps of the Research

Research Protocol:

1. Before the researh conducted, the researcher had conducted ethical clearance at the ethics commission of PMC Hospital, with the results of the research having passed the ethical test based on letter No. 016/RS.PMC/Kom-Etik/VII/2023.
2. Explanation of research objectives, research procedures and asking for approval of willingness to become a respondent.
3. Respondents who are willing to take part in the study and relates to the inclusion criteria, fill out the consent sheet to become a respondent
4. The researcher conducts a general

ISSN CETAK : 2541-2640
ISSN ONLINE : 2579-8723

physical examination of the patient, then reminds the patient not to take pain medication at least 6 hours before the pre-test is carried out

5. Researchers gave respondents a pain level questionnaire.
6. Researchers gave bay leaf decoction (3 cups of water, 5 bay leaves, boiled for 10 minutes) for 3 days in a row, with 1x daily administration. For the control group, researchers taught relaxation techniques to reduce pain levels.
7. The researcher explained to the respondent, if there was a worsening of health conditions, please contact the researcher immediately.
8. After the treatment was completed, the researcher gave a post-test questionnaire measuring the respondent's pain level.

c. Research Flow Diagram

This research was planned to obtain the final result in the form of herbal medication of pandan leaves extract. The choosing of extraction method is very important as the result of extraction will reflect the success rate of the method. After the extraction proccess is continued with fractionation with four different types of solvents based on their polarity. Fractionation is a technique of separating and grouping chemical compounds in extracts based on polarity (20).

d. Data Analysis

Data Analysis of this study using bivariate analysis which is used to see the difference in the effectiveness of pandan leaf decoction on respondents' pain in the experimental group and control group. This study uses dependent and independent t tests. Based on the results of data processing using the SPSS (Statistical Program for Social Science) program.

e. Hypothesis

Hypothesis in this study is that pandan leaf decoction is effective in reducing pain in patients with HNP.

No	Tes material					
		Alkaloids	**Flavonoids**	**Saponin**	**Steroids and Terpenoids**	**Tannin**
1	Pandan Leaves Boiled	-	+	-	+	+

RESULT

1. Phytochemical Profile of Test Materials

Phytochemical test conducted is qualitative phytochemical tests for all test materials, the phytochemical test conducted at the Chemistry Laboratory, Faculty of Health and Mathematics, Muahammadiyah University of Riau (UMRI), the test results can be seen from the table below.

Table 1. Qualitative Phytochemical profile of Pandan Leaves

Desc: (+): owning compound content, (-): not owning compound content

Table 1 described the qualitative phytochemical profile of test material used on this study. It is known from the phytochemical profile that the group of compounds possessed by the pandan leaves decoction test material are flavonoids, steroids and terpenoids, and tannins.

2. Characteristics of the Respondent

Respondents of this study were 30 HNP patients at PMC Hospital, consisting of 15 people in the control group and 15 people in the experimental group who were given pandan leaf decoction to reduce the level of pain felt. The results of analyzing the characteristics of respondents in the study can be observed in the table below:

Table 2. the Analisys of Respondent Characteristics

No	Characteristics	Frequency	Percentage (%)
1.	Age: Experimental Group: a. Final adulthood (36 –	0	0

ISSN CETAK : 2541-2640
ISSN ONLINE : 2579-8723

	45 years old) b. Early Elderly (46 – 55 years old) c. Final Elderly (56 – 65 years old) d. Seniors (65 – above) Control Group: a. Final adulthood (36 – 45 years old) b. Early elderly (46 – 55 years old) c. Final elderly (56 – 65 years old) d. Seniors (65 – above)	5 10 0 0 6 8 1	33,3 66,7 0 0 40,0 53,3 6,7
2.	Gender: Experimental Group: a. Male b. Female The Control Group: a. Male b. Female	 6 9 6 9	 40 60 40 60
	Total	15	100

From table 2 above, it can be concluded that most of the respondents in the experimental group were late elderly, amount 10 people (66,7%) and in the control group most of them were also late elderly, amount 8 people (53,3%). Meanwhile the gender of respondents in the experimental and control groups was mostly female, amount 9 people (60%) in the experimental group, and 9 people (60%) in the control group.

3. **The Effect of Pandan Leaves Decoction to the Level of Pain in HNP Patient**

After obtaining the data of the pain level from the control group of 15 people and the experimental group given the pandan leaves decoction to 15 people, the data was tested for data normality, the results of the *Shapiro-Wilk* normality test showed that the control group data and the experimental group were different from the normal data distribution, because the value obtained was >0,05. Therefore, the analysis test for the comparison of the average pain level uses the *Wilcoxon* and *Mann-Whitney* test. The result of the average level of pain for each group can be ibserved in the table below.

Table 3. Pain Scale Level of HNP Patient for Each Group

No	Group	n	Mean ± SD	p-value
Control				
1	Pre	15	8,53 ± 0,74	0,18
2	Post		8,73 ± 0,88	
Experiment of Pandan Leaves Boiled				
3	Pre	15	8,33 ± 0,97	0,001*
4	Post		5,33 ± 0,72	

Description: *Significantly Different

Form the table 3, it is known that the average pain level of HNP patients before giving the treatment of decoction of pandan leaves of the control group was 8,53 and the experimental group was 8,33. After given the treatment of pandan leaves decoction in the experimental groups there was a decrease in pain levels by 36.01%, with a statistically significant different analysis (p=0,001) between the pain levels before and after the treatment. While in the experimental group there was no cahnge in the pain level of HNP patients (p=0,18).

Furthermore, a comparison of the average pain level between the control group and the experimental group was carried out, the data from the comparison can be seen in the table below:

Table 4. Effect of Pandan Leaf Decoction on Pain Levels of HNP Patients

No	Group	n	Mean ± SD	p-value
1	Control	15	8,73 ± 0,88	<0,0001*
2	Experiment	15	5,33 ± 0,72	

Description: *Significantly Different

Table 4 shows a comparison of the average pain levels of the control and experimental groups, where there was a decrease in pain levels of 39%, after the statistical test of *Mann-Whitney* conducted to see the effect of pandan leaves decoction on pain level obtain the value of p<0,0001. This shows that the average pain level between the control group and the experimental group is statistically significantly different, this result also shows that there is an effect of pandan leaf decoction on the pain level of HNP patients.

DISCUSSION

Hernia nucleus pulposus is a condition where protrusion of the intervertebral disc causes pressure on the spinal cord as it leads to pain and affecting activities. Risk factors for lumbar disc herniation (LDH) are gender, age, occupation, body mass index, and history of trauma (2). Low Back Pain (LBP) Low Back Pain (LBP) is a clinically, socially and economically troubling health problem. There is a worldwide and national increase in LBP every year. LBP and ischialgia are specific symptoms of herniated nucleus pulposus (HNP). The chronic pain suffered by HNP patients can affect health-related quality of life. From the research, there is a significant relationship between pain intensity and quality of life. Higher pain intensity has a strong impact on the low quality of life of lumbar HNP patients, and otherwise (21).

As the result of the research, it was found that pandan leaves decoction is effective in reducing the pain level of patient with Hernia nucleus pulposus as the extract of fragrant pandan leaves are presumed to have important components such as flavanoids, alkanoids, and saponins. Flavanoids have a sedative effect that will cause drowsiness to fall asleep (22). Furthermore, there is previous research stated that pandan water extract have significant analgesic activity both in central (P <0,001) and peripheral mechanism (P <0,001) as it comparable to codeine and aspirin, and more favorable for the use of pandan water extract for rheumatism and rheumatoid asthritis. In traditional medicine, pandan leaves extract further can be explored as a source of phytochemicals that are beneficial to the pharmaceutical industry (23).

ISSN CETAK : 2541-2640
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Pandan leaves are known as it role in relieving the pain, especially arthritis and joint pain. Researchers assumed that pandan extract is rich of phytohemicals that helps reduce arthritis symptoms. Moreover, pandan tea helps the headache and earache. Researchers have shown that drinking pandan tea lower level of the stress hormone cortisol. As the evidence of long-term shown, drinking at least half cup in a day is likely lower the risk of depression and dementia. Additionally, drinking pandan tea could help you to sleep tightly, increase the appetite, prevent hair loss, and detoxify your liver (24). Furthermore, the ethanol extract of Pandanus amaryllifolius contains quercetin which has anti-inflammatory. The gel form is suitable for wound healing therapy as it causes a cold sensation on the skin (16).

This study in line with the research stated that Fragrant Pandan is save to be consumed by the patient, which are not harmful for human as 6 g Fragrant Pandan leaves boiled in 400 ml distilled water up to 200 ml per drink (25). Ethanol extract of Fragrant Pandan leaves with variation temperature and concentration has good antibacterial activity at 50ºC. Ethanol extract of fragrant pandan leaves with variations in soaking time and concentration has the best antibacterial activity at a soaking time of 5 days with a concentration of 100% (26).

The implementation of this research is in line with the research where the pandan leaves decoction are drunk sugar-less, and drink 1-2 times depend on the needs, for example if we want to relieve the joint pain due to rheumatism, we can consume it a maximum of three times a day. Three glassess are drunk before meals, if the medicine are from the doctor we can give a distance around 1 or 2 hours, with the standard of the doctor this pandan leaves decoction is relatively safe for children and elderly, then for pregnant and breastfeeding mothers (27).

Based on the result of the research, researcher assumed that pandan leaves decoction can be alternative to the consumption of chemical drugs by the patient. Especially in HNP patient, who are used to consumed pain medication every day can replace it by pandan leaves decoction. From the result of evaluation of the researcher to respondent, this pandan leaves decoction does not taste bitter, the aroma is pleasant and the leaves are easy to get as it also be easier to be applied by the patient in everyday life.

SIMPULAN

Based on the research found, it can be concluded that pandan leaves decoction is effective in reducing the level of pain in patient of Hernia Nucleus Pulposus.

ACKNOWLEDGEMENT

In conducting the research, many oarties have provided both material and psychological support, including:

- Thanks to Ministry of Research, Technology, and Higher Education and LLDIKTI region X, especially in the field of research for novice lecturers, who have provided opportunities for researchers to obtain research grants for novice lecturers
- Thanks to the Prof.H.Kardimatus Suheimi foundation who has giving the permission for researchers to conduct research properly.
- Thanks to all academic community of STIKes Pekanbaru Medical Center who have provided support for energy and opinion to the researchers in conducting the research.
- Thanks to beloved family who have supported researchers in conducting the research so that it could run smoothly

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