SUPPORT FROM HEALTHCARE PROFESSIONALS FOR COUPLES/PARTNERS USING ASSISTED REPRODUCTIVE TECHNOLOGY IN JAPAN: A LITERATURE REVIEW

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Abstract
Introduction: Assisted reproductive technology (ART) is being used for infertility by an increasing number of couples in Japan. The family care/caring theory proposed by Hohashi (2015) encompasses these factors. In Hohashi's family care/caring model, family support consists of support in the family internal environment; family system unit; family external environment; and family chrono environment. This study sought to clarify the support provided by health professionals to couples/partners undergoing ART based on the support vectors of the family care/caring model.
Method: Articles on Ichushi Web, a Japanese medical literature database, were searched applying keywords "assisted reproductive technology", "infertility", "family", "couple", "nursing", "care", and "support." Family support was extracted from 12 articles, coded into subcategories and categories, and classified in accordance with the targeted support vector of family care/caring.
Results: A total of 21 categories were identified. The main categories were: support for the family system unit, such as "Nurses coordinate the couple's relationship"; support for the family internal environment, such as "Nurses maintain close contacts with the women"; support for the family external environment, including such categories as "Healthcare professionals should provide opportunities for peer support" in micro-system support, and "Nurses should encourage doctors to relate to women" in macro-system support. Family chrono environment support included "Nurses keep in continuous contact with women".
Conclusion: The support was systematically organized according to the support vector of family care/caring theory. It will be necessary to consider direct and indirect support for men in the future. Although support for the supra-system was not considered, support will be needed considering couples' diversity of culture, religion, national characteristics, and regional characteristics of couples in Japan, whose population is largely ethnically homogenous, and many do not practice a religion.

***Key words*:** assisted reproductive technology, family care/caring theory, family support, infertility, literature review

EDUCATION EFFECTIVENESS OF BRAIDED METHODS WITH MEDIA OF KLOP KB ON KNOWLEDGE, ATTITUDE, AND BEHAVIOR OF KB ASEPTORS IN THE MATERNITY WARD AT PRIVATE HOSPITAL IN BEKASI 2022

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ABSTRACT

Background: Family Planning (KB) is a pillar of world health development to improve maternal and child health. Contraceptive services are a priority as an effort to reduce maternal and infant mortality rates.

The purpose of this study was to determine the effectiveness of the BRAIDED method with KB KB media on the knowledge, attitudes, and behavior of family planning acceptors in the maternity care ward of the Bekasi 2022 Private Hospital.

The research method used a quasi-experimental (quasi-experimental) with one pretest-posttest design with a total sampling technique of 52 people. The analysis used using univariate and bivariate tests. The research was conducted by distributing questionnaires in one meeting in the maternity care room at the Bekasi 2022 Private Hospital.

Results: Based on the research, the majority of family planning acceptors were aged 31-35 years, as many as 20 (38.5%) respondents, with tertiary education, as many as 36 (69.2%) respondents, with parity of more than 2 children, namely as many as 47 (90.4%) respondents, 39 (75%), and 39 (75%). The results of the study based on the Wilcxon test obtained a significant value with a p-value of 0.000 < α 0.05 which means that there is an increase in knowledge, there is a change in attitude, and there is a change in the behavior of family planning acceptors after the BRAIDED method education with KB KLOP media on knowledge, attitudes, and behavior of family planning acceptors in the maternity care ward of the Bekasi 2022 Private Hospital.

Conclusion: there is an effectiveness of the BRAIDED method with KB KLOP media on the knowledge, attitudes, and behavior of family planning acceptors in the maternity care room at the Bekasi 2022 Private Hospital.

Key words: BRAIDED method, KB acceptor, KLOP KB

SYNERGISTIC POTENTIAL OF THE COMBINATION MENGKUDU (*MORINDA CITRIFOLIA* L.) AND KELOR LEAVES (*MORINGA OLEIFERA*) POWDER AS FUNCTIONAL FOOD RICH IN FLAVONOIDS AND FIBER: ANALYSIS AND SYSTEMATIC LITERATURE REVIEW

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Abstract

Introduction: Mengkudu and kelor leaves have the potential as herbal plants that can be used for disease therapy because they have high flavonoids and fiber and can have a synergistic effect. But studies using a combination of the two have not been conducted. The purpose of this study is to determine the content of flavonoids and fiber on mengkudu and kelor leaves powder to determine the synergistic potential and compare it with previous studies in a systematic literature review

Method: The materials used are mengkudu powder and kelor leaves powder obtained from the drying process, flavonoid content analysis test using the UV-Vis Spectrophotometry method, and the fiber test using the multi-enzyme method or according to the AOAC guidelines and carried out a systematic literature review.

Results: The two ingredients have their advantages and disadvantages. Where kelor leaves powder has a flavonoid content (2.49 g /100 grams) 3.7 times greater than the mengkudu powder, which is only 0.67 g /100g. Mengkudu powder has the advantage of its fiber content of 26.61 g /100 grams and 1.4 times higher when compared to kelor leaves powder which is only 19.86 g /100 grams. A systematic literature review showed the highest fiber content in mengkudu in powdered extracts, which was 48.55 to 49.26 %, while flavonoids in fermented mengkudu juice were 36.73 mg /100 ml. The highest fiber and flavonoid content in dried kelor leaves or powder is a dietary fiber of 24.97 g /100 g DW and flavonoids are 21.21%.

Conclusion: Combining mengkudu and kelor leaves powder can be used as a way to create complementary products that are rich in flavonoids as well as fiber and cause the expected synergistic effect. Previous research that used the type of processing was powdered was closest to the results of the analysis of this research.

Key words : Fiber, Flavonoid, Kelor, Mengkudu, Powder.

INTRODUCTION

Humans have long utilized plant biodiversity for a variety of purposes. One of the most prominent tropical fruits and vegetables, namely *Morinda citrifolia* or can be known as mengkudu and kelor leaves (Souza & Marcos, 2021). Mengkudu is often used as a complementary and alternative therapy in different countries due to its high antioxidant content and its various benefits that are good for health. Many people use mengkudu as a traditional medicine because it can act as an antibacterial, antitumor, antioxidant, anthelmintic, analgesic, anti-inflammatory, increase immunity, and is even proven to help control gastritis, skin diseases, menstrual disorders, respiratory infections, fever, diabetes, hyper cholesterol, hypertension, cardiovascular diseases, and dyslipidemia (Ali, Kenganora, & Manjula, 2016; Souza & Marcos, 2021). Juices and extracts of mengkudu contain phytochemical compounds that are good for health, such as amino acids, flavonoids, anthraquinones, fatty acids, sterols, terpenoids, lignans, and others (Ali et al., 2016).

Kelor or *Moringa oleifera* is a very abundant plant in Indonesia, where the leaves of this plant have various types of nutrients that are good for health, such as minerals (iron, calcium, and sodium), vitamins C, E, beta carotene, as well as antioxidants (flavonoids, phenolics, glucosinolates, saponins and the presence of fiber isothiocyanates containing fiber ((Putra et al., 2021). Mengkudu and kelor leaves have a very high water content, so the shelf life is concise and limited. A drying method is needed to turn fresh

mengkudu into powder to extend the material's shelf life. Bending or twisting mengkudu into powder can also be used to remove rancid odors due to the content of capric acid and kaproat (Marbun & Rahayuni, 2020; Sudibyo & Hutajulu, 2016). While kelor leaves powder is produced through drying young Moringa leaves can use in an oven or sunlight kelor leaves powder has a longer shelf life than fresh and some better nutrients (Marbun & Rahayuni, 2020).

Mengkudu dan kelor leaves powder contains flavonoids and fiber, which are suitable for health. Flavonoids are one of the most promising phytochemical compounds used as antioxidants and therapeutics for cancer diseases, pathogenic bacterial infections, inflammations, cardiovascular dysfunction, and prevent free radicals. (Arifin & Ibrahim, 2018). Both ingredients contain flavonoids and fiber, which are suitable for health. Flavonoids are one of the most promising phytochemical compounds used as antioxidants and therapeutics for cancer diseases, pathogenic bacterial infections, inflammations, cardiovascular dysfunction, and prevention of free radicals. (T. yang Wang, Li, & Bi, 2018). More than 9000 flavonoids are known to be spread and found in various parts of the world, where these compounds can be found in all types of green plants or plants. The need for flavonoids is very diverse, is around 20 mg to 500 mg. Flavonoids are found in plants that have red, yellow, blue, orange, and purple pigments both at the root, flower, stem, and leaves (Arifin & Ibrahim, 2018).

Dietary fiber is a group of complex carbohydrates that cannot be hydrolyzed by human enzymes so that they cannot be absorbed and digested by the human body. Fiber consists of soluble fiber such as pectin, gom, fructans, and some resistant starches and water-insoluble fibers such as lignin, and cellulose, which can be beneficial for health, accelerate gastric emptying and increase the number of feces to facilitate bowel movements. However, fiber also correlates with the risk of diabetes, metabolic syndrome, inflammation, obesity, atherosclerosis, and heart disease (Ghada A. Soliman, 2019). Based on the description above, we can see that the mengkudu and kelor leaves powder to contain fiber and flavonoids, which can potentially cause synergistic effects if combined and can be developed as a therapy for the control of a disease. However, a deeper exploration of the flavonoid and fiber content of the two ingredients is needed to ascertain the possibility of a potential synergistic effect. Therefore, researchers are interested in testing the range of flavonoids and fiber in the mengkudu and kelor leaves powder. To see the content of the two phytochemical compounds owned through laboratory tests and conduct a systematic literature review to compare the test results with previous studies with various types of preparations.

METHOD

Analysis of Flavonoid and Fiber Content

Materials used in the study were mengkudu, and kelor leaves powder obtained from buying at the herbal shop in the east Porwokerto area, Banyumas-Central Java. The powder is 100% original without additional ingredients; the product already has a distribution permit, ethanol, 5% AlCl3 solution, 95% alcohol, aquades, antifoam agent, and 5% acetic acid.

The tools used in the analysis test are scales, erlenmeyer, filter paper, spatula, claws, stove, test tube, desiccator, measuring cup, and spectrophotometer. The flavonoid and fiber content analysis test was carried out at the Chem-Mix Pratama Bantul-Yogyakarta Laboratory in September-October 2021.

Analysis of Flavonoid Content

The Flavonoid content analysis test uses the UV-Vis spectrophotometry method. With several stages,

a. Determining the Maximum Wavelength
   Take 1 ml of 100 ppm quercetin solution added at 1 ml of AlCl3 10% and 8 ml of 5% acetic acid. Read wavelengths using a UV-Vis Spectrophotometer wavelength of 400-500 nm.
b. Determining The Operating Time
   Take 1 ml of 100 ppm quercetin solution added at 1 ml of AlCl3 10% and 8 ml of 5%

acetic acid. Read wavelengths using a UV-Vis Spectrophotometer wavelength of 400-500 nm.

c. Determining the Quercetin Standard Curve
They made a series of solutions using quercetin ranging from 40, 60, 80, 100, 120, and 140 ppm. Each series of 1 ml is included in 1 ml of AlCl3 10% and 8 ml of 5% acetic acid. Let it stand according to the maximum time of the results of determining the operating time. Read with a spectrophotometer at a total length of waves

d. Determining Total Flavonoid Levels
A solution of mengkudu powder and kelor leaves powder is taken as much as 1 ml and added with 1 ml of AlCl3 10% and 8 ml of 5% acetic acid. Let stand at the optimal time and read absorbance at maximum wavelength using a spectrophotometer, carried out twice.(Fatahillah Pasaribu, Wiboworini, & Retna Kartikasari, 2021; Ramadhani, Hati, Lukitasari, & Jusman, 2020)

Analysis of Fiber Content

The fiber content analysis test using the multienzyme method was carried out utilizing sample powder weighed as much as 0.5 grams and taken in Erlenmeyer with 50 ml of phosphate ph seven. Buffer added, 0.1 ml of alpha-amylase enzyme heat it in a 100 °C temperature water affirmation for 30 minutes by stirring occasionally. Cool the sample and add 20 ml of distilled water and 5 ml of HCL 1N, 1 ml of 1% pepsin enzyme, and reheat for 30 minutes. After that, remove the Erlenmeyer tube and add the sample with 5 ml of NaOH 1N, the enzyme beta-amylase 0.1 ml, then close the Erlenmeyer tube and incubate in a water affirmer for 1 hour, after which strain with constant paper. The sample was washed with 1 x 10 ml of ethanol and 2 x 10 ml of acetone, dried in a 105°C oven for one night, dried in a desiccator, and weighed the final weight (insoluble dietary fiber). The filtrate is set in volume to 100 ml, and the ethanol is 95% warm by 400 ml. the filtrate is precipitated for 1 hour. After that, it is filtered with ash-free paper, washed with 2 x 10 ml of ethanol and 2 x 10 ml of acetone, dried in an oven at a temperature of 105°C, and again put a desiccator input and weighed the final weight (soluble fiber). Total dietary fiber is insoluble dietary fiber + soluble dietary fiber.

Systematic Literature Review

This research uses Systematic literature review studies, which is a process or activity of collecting data from various sources such as journals and comparing the results of one study with another. The systematic literature review provides a comprehensive overview of multiple sources related to themes/topics and methods and conducts synthesis to strengthen the knowledge base (Paul & Criado, 2020). e article used in this study comes from a Google scholar database with Inclusion Criteria 1) Displaying the results of the examination of Flavonoids and mengkudu fibers or kelor leaves 2) Fiber tests using proximate, multienzyme methods, acid-base hydrolysis, or according to AOAC and Flavonoid guidelines with spectrophotometric tests or Solid-phase microextraction coupled with gas chromatography-mass spectrometry (SPME-GC-MS) 3) Article published in the last 5 years (2018-2022) 4) Using English or Indonesia 4) Full Text 5) Can be accessed for free. Exclusion criteria 1) not displaying flavonoid or fiber levels, 2) Research with animals or humans, 3) Incomplete or non-free articles, 4) Review Articles, 5) Adding other ingredients to mengkudu powder or kelor leaves powder.

The literature search used keywords such as "Flavonoid", "Dietary fiber", "Morinda citrifolia", and "Flavonoid", "Dietary fiber", and "Moringa Oleifera". The research process was carried out comprehensively by going through 5 stages, including comparing, contrasting, criticizing, synthesizing, and summarizing. The method of reviewing and selecting studies is carried out based on the guidance of PRISMA, which is an instrument based on evidence for the manufacture of systematic reports or meta-analysis (Moher, Liberati, Tetzlaff, & Altman, 2009).

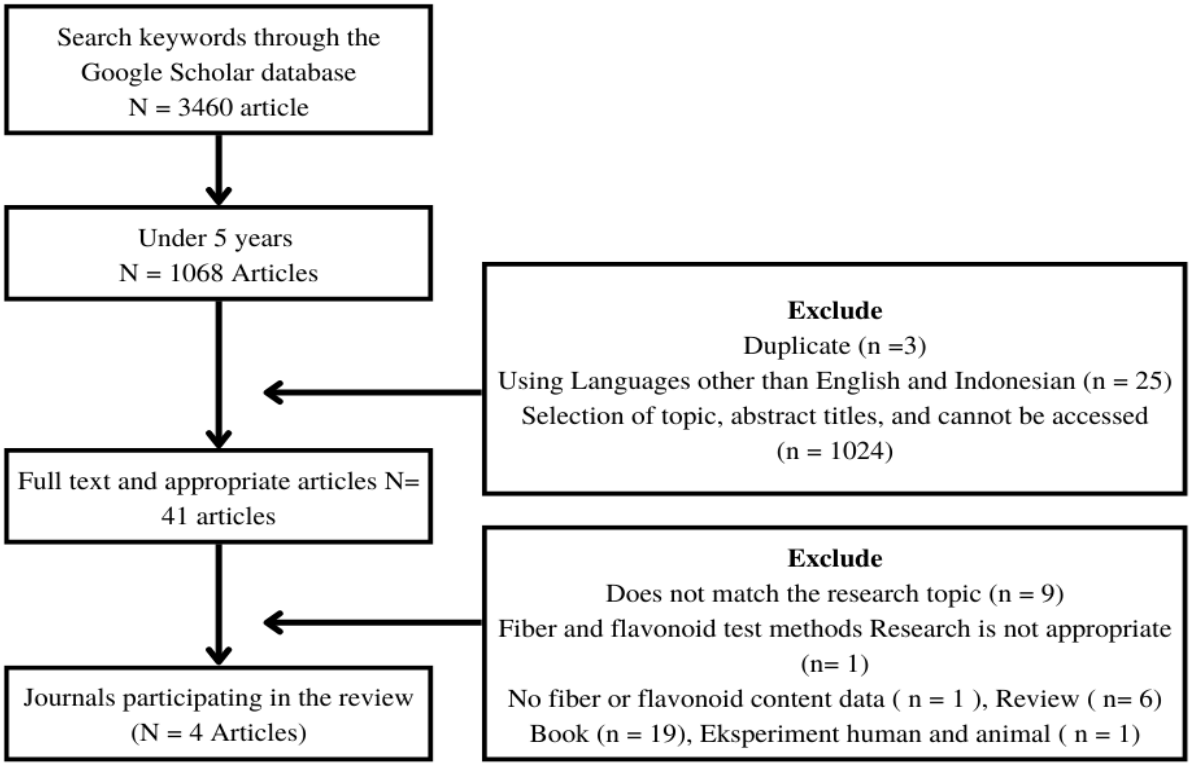

Figure 1. PRISMA Flow Chart *Morinda Citrifolia*

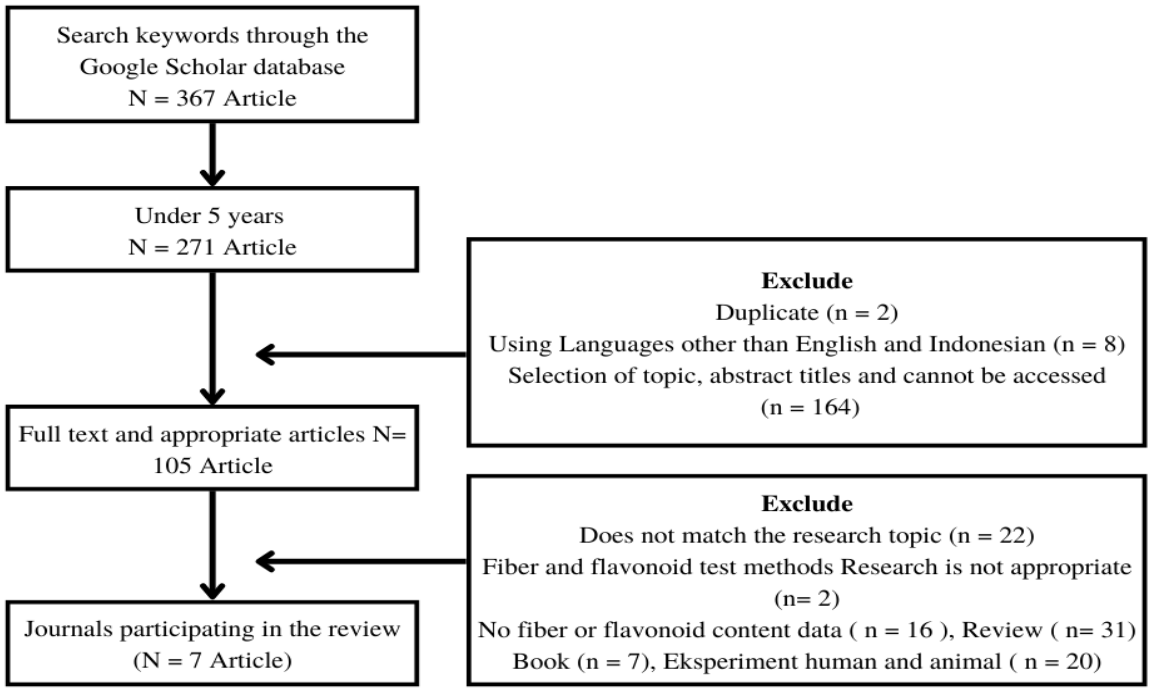

Figure 2. PRISMA Flow Chart *Moringa Oleifera*

RESULTS

Analysis of Flavonoid and fiber Content in mengkudu Powder and Kelor leaves powder

The study's results tested the content of flavonoids and fibers in the mengkudu powder, and kelor leaves powder is presented in tables 1 and 2.

Table 1. Analysis of Flavonoid and fiber Content in Mengkudu Powder

Sample	Test		Result	
	Test 1 (g/100 g)	Test 2 (g/100 g)	(g/100 g)	%
Fiber	26,62	26,71	**26,67**	**26,67**
Flavonoid	0,66	0,67	**0,67**	**0,67**

Table 2. Analysis of Flavonoid and fiber Content in Kelor Leaves Powder

Bahan	Test		Result	
	Test 1 (g/100 g)	Test 2 (g/100 g)	(g/100 g)	%
Fiber	19,94	19,78	**19,86**	**19,86**
Flavonoid	2,49	2,49	**2,49**	**2,49**

Systematic Literature Review

After making a selection using PRISMA principles in the Google Scholar database, the article that best suits this research was obtained, which is presented in tables 3 and 4

Table 3. Mengkudu (*Morinda Citrifolia* L)Literature Search Results

Author/Years/ Country	Title	Sample Type	Method	Results
Saah and David /2021/Ghana	Phytochemical, Proximate, and Vitamin C Content in *Morinda citrifolia* (Noni)	*Morinda citrifolia*, L Extracts	Fiber : Proximate analysis	Crude Fiber 4.49 %
Wang Z, Rong D, Ruili Y, Kun C, Congfa Li and Wu Li/2021/China	Changes in Phenols, Polysaccharides and Volatile Profiles of Noni (*Morinda citrifolia* L.) Juice during Fermentation	*Morinda Citrifolia, L* Fresh Juice and Fermentation	Flavonoid : Solid-phase microextraction coupled with gas chromatography–mass spectrometry (SPME-GC-MS)	Flavonoid Fresh Juice = 26, 07 mg/100ml Flavonoid Fermentation Juice = 36,73 mg/100 ml
Nguyen CT, Tuyen CK, Hoang TH, Duong HQ , Tien TN, Dinh HD and Dang XC/2020/Vietnam	Phytochemistry, nutrient, mineral, and antioxidant activities of two species Morinda L. grown in three provinces in Vietnam	*Morinda citrifolia* Extracts Powder	Fiber : Enzymatic-Gravimetric-Liquid Chromatography (AOAC)	Fiber Extracts Powder = 48.55 to 49,26 %
Oly-Alawuba and Amaka AI/2019/Nigeria	Evaluation of Nutrient, Antinutrient and Phytochemical Properties of Noni Fruit (Morinda citrifolia) Concentrate, Pulp, and Seed	*Morinda citrifolia* Juice Extract / konsentrat	Fiber : Proximate Analysis	Crude Fiber = 1.95 %

Table 4. Kelor (*Moringa Oleifera*) Literature Search Results

Author/Years/Country	Title	Sample Type	Method	Results
Solichah E, Ade CI, Devry P, Dewi D, Wawan A, Woro S and Aini H/2022/Indonesia	Evaluation of physicochemical, nutritional, and organoleptic properties of nuggets based on moringa (*Moringa oleifera*) leaves and giant catfish (*Arius thalassinus)*	*Moringa oleifera* Extract	Flavonoid : UV-Vis spectrophotometer	Flavonoid 2.53 mg/100 g
Penalver R, Lorena MZ, Jose ML, Gaspar R and Gema N/2022/Spain	Nutritional and Antioxidant Properties of *Moringa oleifera* Leaves in Functional Foods	*Moringa oleifera* leaves dried	Fiber : Procedure 985.29 of the Fiber : AOAC	Dietary Fiber 24.97 g/100 g DW
Siskawardani DD, Sri W and Khwunta K/2021/Indonesia	The Antioxidant Activity of Kelor (Moringa oleifera Lam.) Leaves Based on Drying Method	*Moringa oleifera* powder	Flavonoid : Spectrophotometer Fiber : AOAC (*Enzymatic-Gravimetric-Liquid Chromatography*)	Fiber 3.09 % Flavonoid Cabin dryer (50˚C) 1.41 mg/g Oven (50˚C) 1.82 mg/g
Murdiasa PY, I Putu S and Putu TI/2021/Indonesia	Pengaruh Penambahan Puree Daun Kelor (Moringa oleifera) Terhadap Karakteristik Siomay Ayam	Puree *Moringa oleifera*	Fiber : Acid-base hydrolysis method	Crude Fiber 6.40%
Ola-Adedoyin A, Samuel OE, Ifreke ML, and Kayode OO/ 2021/ Nigeria	Effect of Different Blanching Treatments on the Nutritional Composition, Phytochemical Contents and Antioxidant Activity of Dried Moringa oleifera Lam. Leaf Flour	*Moringa oleifera* powder	Flavonoid : UV–Vis spectrophotometer Fiber : Proximate analysis	Crude Fiber Steam blanching 29,31 %, Boil water blanching 17.74 % on 100˚C 3 min unblanching 23.87% Flavonoid Steam blanching 51.77 mg/100g, Boil water blanching 51.73 mg/100 g on 100˚C 3 min unblanching 56.93 mg/100 gram
Rane MA, Marsianus P and Catootjie LN/2021/ Indonesia	Evaluasi Komposisi Nutrisi Tepung Daun Kelor dari Lokasi yang Berbeda di Nusa Tenggara Timur, Indonesia	*Moringa oleifera* powder	Fiber : AOAC (2005)	Crude Fiber 96.63 to 107.30 g/kg
Wickramasinghe YWH, Indira W and Isuru W/ 2020/ Sri Langka	Effect of Steam Blanching, Dehydration Temperature & Time, on the Sensory and Nutritional Properties of a Herbal Tea Developed from *Moringa oleifera* Leaves	*Moringa leaves* Dried	Flavonoid : UV–Vis spectrophotometer Fiber : Proximate analysis	Crude Fiber Blencing 3 min 7.05% unblencing 8.03% Flavonoid Blencing 3 min 21.21%

unblencing
19.07%

DISCUSSION

Analysis of Flavonoids And Fibers With The Resulting Synergistic Potential

The Mengkudu powder (*Morinda citrifolia* L.) is a nutritious food containing carbohydrates, proteins, vitamins B, and essential minerals. The powder includes several vitamins, including vitamins A, C, niacin, thiamin, and riboflavin, and several minerals, namely iron, calcium, sodium, and potassium. Phytochemical compounds in mengkudu are terpenes, alizarin, Anthraquinone, caproic acid, caprylic acid, and alkaloids. The powder also has a high bioactive compound where antioxidant activity is 60,473 mg/ml, and flavonoid content is 7.2 mg QE/g (Irawan, Yusmarini, & Hamzah, 2017). Kelor leaves powder is a food ingredient. That is familiar to us to consume and can usually be processed into various, such as additional baking ingredients, drinking brews, nuggets, and others, the fiber content in kelor powder is also high, namely crude fiber 3.67%. In addition, the characteristics of the nutritional content in kelor leaf powder are 20% (w/b), water content 6.64%, ash content 11.67%, fat content 6.74%, protein content 23.37%, carbohydrates 51.59%, calories 342.31 kcal/kg, iron (Fe) 177.74 ppm, calcium (Ca) 16350.58 ppm, sodium (Na) 1206.54 ppm and phosphorus (P2O5) of 290.65 mg / 100 g .

Dietary fiber has been linked to the management of non-communicable diseases and metabolic syndromes (Kurniawati & Fitriyya, 2018). The two powders tested, namely mengkudu and kelor leaves, have different advantages and limitations and have the potential to cause synergistic effects when combined, namely, which will complement each other to create products rich in flavonoids as well as fiber. Almost 70% of the people in the world use plants as herbs that can help to treat and maintain health. Several plants are consumed singly or combined. When plants are combined, the effects caused will be even more complex because it allows for interactions between compounds. The expected interaction is to take advantage of synergistic or additional therapeutics. Combinations of herbs or plants that are potentially good for health are necessary for the treatment of critical, chronic, and complex illnesses (Haryanti, Sholikhah, & Widiyastuti, 2019). Kelor leaf powder has a flavonoid content of 2.49 g / 100 grams which means it is 3.7 times greater than the powder of only 0.67 g / 100 grams. However, the powder has a twist on its fiber content of 26.61 g / 100 grams and is 1.4 times higher when compared to kelor leaves which are only 19.86 g/100 grams.

The combination of the two, rich in flavonoids and fiber, can be used as functional food, which is helpful as a disease therapy and maintains a healthy body. Antioxidants play a role in neutralizing free radicals effectively to reduce the damage caused. Flavonoids are substances that can act as antioxidants that can inhibit oxidation reactions from ROS by binding to free radicals so that oxidative stress can decrease. one of them is to prevent insulin resistance and lipid peroxidation to control lipid profiles where which can prevent degenerative diseases such as diabetes and dyslipidemia (Halan, Woda, & Setianingrum, 2019). The high fiber content can also reduce fasting blood glucose levels, LDL, triglycerides, and total cholesterol and increase HDL. Fiber can provide a prolonged feeling of satiety because it can absorb large amounts of water in the GI tract, limiting our food intake, especially carbohydrate and fat sources. Fiber can also slow down the absorption of food so that food glucose will be absorbed not much and will also cause a lot of fat to be burned as energy so will control that blood glucose and lipid profiles (Kurniawati & Fitriyya, 2018).

Fiber can also bind lipids in the intestines to lower cholesterol levels by up to 5% or more (Nastiti, Nurhidajah, & Yusuf, 2020). Kelor leaf powder and mengkudu have soluble fiber that can play a role in forming a gel in the small intestine. The gel can later bind lipids, cholesterol, and bile acids to be removed. Bile acids bound and discarded cause bile acids in the liver to decrease and increase the

excretion of bile acids. The impact is that the cholesterol absorbed by the body will reduce because part of the cholesterol will bind to bile acids and be removed through feces. The liver will produce bile acids again because many have been wasted because they are attached to the gel by taking cholesterol in the blood so that later it reduces cholesterol levels in the blood so that later reduces cholesterol levels in the blood (Rupiasa, Fatimah-Muis, Syauqy, Tjahjono, & Anjani, 2021).

Previous research has shown the benefits of mengkudu, and kelor leaves as potential functional foods in Indonesia. One of its health benefits is that it can be used as a therapy to control blood glucose and lipid profiles. These two indicators are the originator of various types of degenerative diseases. Previous studies have shown that the administration of mengkudu extracts can reduce pre- and postprandial glucose at a dose of 750 mg/kg bb and also an amount of 125 mg/kg bb in rats Wistar DM (Anwar & Nugroho, 2015; Zega, Wowor, & Mambo, 2016). Another study using 250 ml of mengkudu cider added to manufacture plain bread lowered blood glucose levels. While kelor leaf powder at a dose of 50-100 mg/kg bb can reduce fasting blood glucose levels, the kelor leaf extract of 600 mg/kg bb can increase HDL in DM rats (Nurul Laelatunisa, Nikmatul Rizky, Rachmadanti Arum, 2019; Satrianawaty, Sumarno, & Prabowo, 2019; Villarruel-López et al., 2018). While in human studies, it has also been carried out where it gives 1000 mg/day of Moringa powder for 25 days to prediabetes subjects and is known to reduce blood glucose levels up to 20 mg/dl (Munim, Alwi, & Syam, 2019).

Analysis of Systematic Literature Review Results

Based on the results of article searches conducted on Google scholars by applying Prisma principles, four articles were obtained that are suitable for Mengkudu research and seven articles for research that discuss fiber and flavonoid levels in Moringa. The fiber in the results of the researcher's analysis was known to be 26.67 g / 100 g or 26.67%, and flavonoids 0.67 g / 100 g BW or 0.67%, while the results of the previous study showed results that the extracted mengkudu contained crude fiber by 4.49% this is different from other studies, namely mengkudu in the form of extract powder is known to have fiber by 48.55 to 49.26%, and this study shows that the extracted powder extract is two times greater than the powder that not contracted by the researcher (Nguyen et al., 2020; Saah & Adu-Poku, 2021). Mengkudu fiber-made juice or concentrate is 1.95% crude fiber (Nkeiruka M. Oly-Alawuba & Amaka A. Iwunze, 2019). Previous research that showed the results of flavonoid content in mengkudu, which was made of fresh juice and fermented, was known to contain flavonoids, namely fresh juice of 26.07 mg / 100 ml and fermented of 36.67 mg / 100ml (Z. Wang et al., 2021).

The results of the kelor powder content analysis conducted by researchers found that the fiber content was 19.86 g / 100 g or 19.86%, while the flavonoid content was 2.49 g / 100 g or 2.49%. Previous studies have been carried out which show the results of different fibers and flavonoids, showing that kelor leaves in the extract showed flavonoid content of 2.53 mg / 100 g, other studies leaves that were used as powder fiber content were 3.09% and flavonoids which were distinguished based on the type of drying were recorded with a cabin dryer (50 ° C) obtained 1.41 mg/gram while if in the oven (50 ° C) the flavonoids were 1.82 mg / g (Siskawardani, Winarsih, & Khawwee, 2021; Solichah et al., 2022). Another study of kelor leaves used as the powder was known to contain crude fiber, which was previously steam blanching 29.31%, boil water blanching at 17.74% temperature 100 °C 3 min and unblanching 23.87%. This study included the results studied by researchers using powder without blanching. While the flavonoid content is steam blanching 51.77 mg / 100grams, boil water blanching 51.73 mg / 100 g temperature 100 ° C 3 min and unblanching 56.93 mg / 100 grams (Ola-Adedoyin, Etatuvie & Olaniyan, 2021). Starchy leaves of kelor were also reported to contain crude fibers of 96.63 to 107.30 g/kg (Rane, Perunggu, & Nalle, 2021).

Kelor leaves are often also processed into dry leaves, which can be used as tea. The study conducted using dry leaves was known to contain 24.97 g / 100 g of fiber, which this study was close to the results of the researcher's analysis, namely 19.86 g / 100 g. In other studies, dry leaves contained crude fiber blanching for 3 minutes at 7.05%, without blanching at 8.03%, and flavonoid blanching for 3 minutes at 21.21% and without blanching at 19.07% (Peñalver, Martínez-zamora, Lorenzo, Ros, & Nieto, 2022; Wickramasinghe, Wickramasinghe, & Wijesekara, 2020). Kelor puree made with a small amount of water

and leaves is known to contain 6.40% crude fiber (Yumiko Murdiasa, Suparthana, & Timur Ina, 2021).

The results of previous studies showed differences in flavonoid and fiber test results in mengkudu and kelor depending on the type, geographical location, and processing method. Previous research using the kind of processing was dried and powdered was closest to the results of the researchers' analysis carried out in Indonesia. Flavonoids that are still classified as polyphenols will risk damage due to enzymatic processes. Processing such as steaming also causes the release of phenolic compounds with low molecular weight, such as flavonoids. The longer the process of withering or blanching and drying the leaves can reduce the flavonoid content significantly. Because flavonoid compounds are not heat resistant (Liana Dewi, Ari Yusasrini, & Wisaniyasa, 2021). Fiber will increase along with the increase in drying temperature, where high temperatures can reduce water content and produce an increase in carbohydrates (Kusuma, Putra, & Darmayanti, 2019). The drying and withering process can also maintain and increase foodstuff's fiber content. In this process, the water content will decrease along with the increase in carbohydrate content (Liana Dewi et al., 2021). The fiber in the previous study was mostly crude, while this used dietary fiber. Crude fiber is derived from vegetables and fruits and is known as a non-nutritional substance but has good benefits for removing feces or smoothing the gastrointestinal tract (Pandey, Pongoh, & Reo, 2021). While dietary fiber is a part of edible plants or carbohydrates that can withstand digestion and absorption in the human GI tract, based on its solubility, dietary fiber is divided into 2, namely soluble and insoluble. Several studies have proven that dietary fiber plays a role in various diseases such as cardiovascular disease (CVD), obesity, cancer, and type 2 diabetes (Veronese et al., 2018). While dietary fiber is a part of edible plants or carbohydrates that can withstand digestion and absorption in the human GI tract, based on its solubility, dietary fiber is divided into 2, namely soluble and insoluble. Several studies have proven that dietary fiber plays a role in various diseases such as cardiovascular disease (CVD), obesity, cancer, and type 2 diabetes (Dahlan, 2020).

CONCLUSION

The results of laboratory tests show that mengkudu powder and kelor leaves powder can synergistically and complement each other. Kelor leaf powder has a flavonoid content of 2.49 g / 100 grams, meaning it is 3.7 times greater than mengkudu powder, which is only 0.67 g / 100 grams. However, mengkudu powder has a twist on its fiber content of 26.61 g / 100 grams and is 1.4 times higher when compared to kelor leaves which are only 19.86 g / 100 grams. The results of the systematic review showed the highest fiber content in mengkudu, namely in extracts powder, which was 48.55 to 49.26%, while flavonoids in fermentation juice were 36.73 mg / 100 ml. The highest fiber and flavonoid content in dry kelor or powder is dietary fiber 24.97 g / 100 g DW. In contrast, flavonoids are 21.21% before drying. The leaves are blanched for 3 minutes with water at 100 ° C.

Previous research that used the type of processing was dried and powdered was closest to the results of the analysis of the research conducted now. Can make suggestions on experimental animal studies to prove the benefits of combining the two ingredients against the therapy of either simple or complex diseases such as metabolic disease.

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