Indonesian Journal for Health Sciences
Vol. 7, No. 2, September 2023, pp. 66-72
ISSN 2549-2721 (Print), ISSN 2549-2748 (Online)

LITERATURE REVIEW: THE LEVEL OF PUBLIC KNOWLEDGE ABOUT THE BENEFITS OF OKRA FRUIT AGAINST DIABETES MELLITUS

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Article History:
Submitted:23/12/2023
Accepted:29/08/2023
Published:20/09/2023

Keywords:
Okra Fruit,
Diabetes Militus,
Knowledge

ABSTRAK

Abstract:
Measuring blood glucose levels on a regular basis is very important to avoid complications. The okra plant (Abelmoschus escelentus) is a plant that is often used for alternative medicine. This plant is used is the part of the fruit. The purpose of this study was to determine public understanding of the benefits of okra fruit to reduce blood sugar levels for diabetes among the community. This study used the literature review method with PICO criteria and article searches were obtained through online search sites, namely through the Indonesian library site and searches using the form of google scholar, scien direct, and willey. The results show that there is significant public understanding regarding okra knowledge to lower blood sugar levels in people with diabetes mellitus and there is an effect on okra fruit to lower blood sugar levels in diabetes mellitus. Okra fruit is proven to have the benefit of lowering blood sugar levels, besides that okra fruit is easy to get and the price is not too expensive. Non-pharmacological therapy using okra is very good especially for people with diabetes mellitus.

***Abstrak*:**
Melakukan pengukuruan kadar glukosa dalam darah secara berkala sangat penting untuk menghindari terjadi nya komplikasi. Tanaman okra (Abelmoschus escelentus) adalah tumbuhan yang sering dimanfaatkan untuk pengobatan alternatif. Tanaman ini yang dimanfaatkan adalahan bagian buahnya. Tujuan penelitian ini untuk mengetahui Pemahaman Masyarakat akan manfaat buah okra untuk menurunkan kadar gula darah terhadap penyakit diabetes pada kalangan masyarakat. Penelitian ini menggunakan metode literature review dengan kriteria PICO dan pencarian artikel diperoleh melalui situs pencarian online yaitu melewati situs perpustakaan Indonesia dan pencarian menggunakan berupa google scholar, scien direct, dan willey. Hasil terdapat pemahaman masyarakat terkait pengetahuan okra untuk menurunkan kadar gula darah pada penderita diabetes mellitus dan terdapat pengaruh pada buah okra untuk menurunkan kadar gula darah pada penyakit diabetes mellitus. Buah okra terbukti memiliki manfaat menurunkan kadar gula darah, selain itu buah okra mudah di dapatkan dan harganya tidak mahal. Terapi non farmakologi menggunakan buah okra sangat bagus apa lagi untuk penderita diabetes mellitus.

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How to Cite:
M. Pratiwi, Jaenudin, A. Pratiwi, "Literature Review: The Level of Public Knowledge About The Benefits of Okra Fruit Against Diabetes Mellitus", Indonesia. J. Heal. Sci., vol. 7, no. 2, pp. 66-72, 2023.

INTRODUCTION

According to Guariguata et al. 2018, DM (diabetes mellitus) is a metabolic disorder that is very common in the world and the number of DM is estimated to be higher from 2014 to 2035 [1]. Based on PERKENI, DM (diabetes mellitus) is included in the group of metabolic disorders characterized by using plasma glucose levels of >126 mg / dl by checking fasting blood sugar, >200 mg / dl by checking blood sugar two hours after doing an Oral Glucose Tolerance Test (TTGO) and >200 mg / dl by checking GDS (blood sugar at any time) followed by other complaints, and blood sugar levels two hours after meals >180 mg/dl [2].

According to the International Diabetes Federation in 2017, the prevalence / number of occurrences / diabetes mellitus in the world in 2015 occupied 415 million people and increased in 2017 to 425 million based on the total universal population or approximately 8.8% of adults aged 20-79 years. In Indonesia is ranked sixth as the highest number of adult DM patients in the world with around 10.3 million people after Mexico (12 million), China (114.4 million), the United States (30.2 million), India (72.9 million), Brazil (12.5 million) and the number is estimated to always increase and gain 16.7 million in 2045 [3].

According to Riskesdas in 2018 the number of diabetes mellitus in Indonesia is getting higher and higher, as described by the Research and Development Agency on the National Basic Health Research Information (RISKESDA) in 2018, the number of occurrences of diabetics in Indonesia has increased relevantly throughout the last five years starting from 2013 the number of DM incidence in adults as much as 6.9% and in 2018 increased by 8.5% [3].

Based on Riyanti et al. 2017, Okra plant (*Abelmoschus escelentus*) is a plant that is often used for alternative medicine, namely for DM. The plant components of okra are very Often used is the fruit. Okra fruit also hasthe nickname *lady's finger* which is scattered in Africa, Nigeria, Southern Europe, America and Asia. Activity experiments on alpha-glucosidase inhibitors using in vitro techniques that utilize calorimetry techniques in which acarbose (antidiabetic drugs) can be used as a comparison. The conclusion of the study proved that the water extract and ethanol extract in okra fruit can withstand alpha-glucoisade molecules amounting to IC50 respectively as much as 32.607 µg / ml, and 57.502 µg / ml and the amount of IC50 active substance akarbose is 10.95 µg / ml.

According to [4], okra contains secondary metabolic compounds such as tritepenoids, dlavonoids, and phenolics. Flavonoids found in okra fruit is queratin has a function as a hyperglycemic agent. Quercetin is an element derived from bioactive andhas an antioxidant function to reducefree radicals in the body. According to provisional research has been carried out by [5], about the relationship of various doses of okra fruit mucus to reduce plasma glucose levels and states that the higher the dose given, the higher the decrease in plasma glucose levels.

One alternative that is widely used by the wider community to control blood sugar levels is with okra plants (*Abelmoschus esculentus*) is an herbal plant that is high in fiber and flavonoid content as antioxidants. In addition, okra plants also contain alpha-cellulose and hemicellulose which belong to the group of dietary fiber or dietary fiber that has antidiabetic effects [6]. Based on the above background, researchers are interested in conductingfurther research on "The Relationship of Public Knowledge Level on the benefits of Okra fruit against Diabetes Mellitus among the Community".

RESEARCH METHOD

The method used in this article is descriptive analysis. The descriptive analysis method is carried out by describing facts which are then followed by an analysis, not just explaining, but providing an interpretation and sufficient explanation. The data that has been obtained is collected into one, then an analysis is carried out, anda

conclusion is drawn about the study of literature.

In carrying out the analysis, researchers searched for published through the Indonesian library website and searches in the form of Google Scholar, Sciendirect, and Willey.

RESULTS AND ANALYSIS

Community Understanding

The first article of research conducted by [7], entitled "Utilization of okra food as a therapeutic companion in type II Diabetes Mellitus patients" with a method in the form of counseling. The sample was 21 people. The results of this study explained about okra fruit starting with the shape of okra, what are its benefits, and how to process okra, so there is a relationship about people's knowledge of okra fruit by consuming okra fruit to lower blood glucose levels.

The second article of research conducted by [8], entitled "The Use of Okra Plant (*Abelmoschus escelentus*) as an Alternative Therapy for Type 2 Diabetes" using okra fiber around 20-35g / day. The results of this study that okra can increase dietary fiber intake dominated by soluble type, by patients with type 2 diabetes mellitus, can improve glycemic control and decrease hyperinsulinemia in addition to lowering plasma lipid concentrations to the desired extent. So it can be said that there is a relationship about okra fiber to the decrease in blood sugar.

The third article of research conducted by [9], entitled "The Potential of Okra Fruit (Abelmoschus escelentus (L) Moench) as an Alpha-Glucosidase Inhibitor" with in vitro testing of water extract and okra fruit ethanol extract, the community processed okra fruit simply, by soaking okra fruit slices in drinking water and allowed to stand for 3 hours, then drunk. Aqueous and ethanol extracts gave IC50 values of 32.61 µg/ml, respectively; and 57.50 µg/ml, while akarbose is used In comparison, alphaglucosese inhibitors are 10.95 µg/ml. The water extract of okra fruit provides stronger activity compared to ethanol extract, judging from the smaller IC50 value.

The fourth article of research conducted by [2], entitled "Anti-Diabetic Effects of Okra Plant (Abelmoschus escelentus)" with secondary data collection method passed in vitro testing of alpha-glucosidase inhibitor activity. Sample as much as 100gr okra fruit. The results of this study have been scientifically proven through in vitro experiments to have the inhibitory activity of alpha-glucosidase enzyme with IC50 values for water and ethanol extracts of 32.607 µg / ml, and 57.502 µg / ml, respectively. So many people use okra fruit to treat several diseases, especially to lower blood sugar levels.

The fifth article of research conducted by [10], entitled "The Effect of Okra Juice Consumption (Abelmoschus escelentus) on Reducing Blood Sugar Levels in Diabetes Mellitus (DM) Patients in the Katobumi Health Center Work Area" with quantitative methods with an experimental approach to pre-post test design with control group (One group pre-post desing with control group). A sample of 28 respondents. The results of this study showed that okra fruit extract juice has an effect on reducing blood sugar levels. Okra juice can be an option to lower blood sugar levels / Alternative choice in curing diabetes mellitus so that people can consume it. So that the results of the study were obtained as many as 28 respondents to 22 while the other 6 respondents did not experience a decrease in blood sugar levels.

The Effect of Okra Fruit

The sixth article of research conducted by [11], entitled "*The effects of okra (Abelmoschus esculentus L.) products on glycemic control and lipid profile: A comprehensive systematic review*" with secondary data collection methods. Samples using okra powder at doses of 100 or 200mg/kg and 31.25 g in diabetic wistar rats. The results of this study propose that okra products (powder, ethanol, and antioxidant ingredients such as flavone glycosides) may have beneficial effects on hyperglycemia and

hyperlipidemia due to their antioxidant compounds, fiber, and polysaccharides.

Article 7 conducted by [12], with the title Test of the effect of okra fruit extract (*Abelmoschus esculentus*) on blood glucose levels in alloxan-induced wistar rats (Rattus norvegicus). The method used was experimental with experimental animals in the form of 15 alloxan-induced wistar rats as substances that provide experimental diabetic conditions. The results of measuring glucose levels in the group given okra fruit extract were found to decrease but did not reach normal blood glucose levels.

Article 8 conducted by [5], with the title Use of Various Doses of Okra Fruit Infusion (*Abelmoschus esculentus*) for Lowering Blood Sugar Levels of White Rats (Rattus *norvegicus*) Hyperglycemia. The method used is a real study (true experimental) with the Use of Various Doses of Okra Fruit Infusion (*Abelmoschus esculentus*) for Reducing Blood Sugar Levels of White Rats (Rattus norvegicus) Hyperglycemia, stating that okra fruit infusion can lower blood sugar hyperglycemia rats for several reasons. First because of the high fiber content in okra fruit, which is in the form of alpha cellulose and hemi cellulose. Such fiber can help to stabilize blood sugar by limiting the rate of sugar absorption in the intestinal tract [13]

Article 9 conducted by mishra, 2018 with the title *A review on: Diabetes and okra (Abelmoschus esculentus).By administering AEPP and AESP at doses of 100 and 200 mg/kg to diabetic rats* , the coats and seed powder at doses of 100 and 200 mg/kg in diabetic rats showed a significant reduction in blood glucose and increased body weight compared to diabetic control rats. Because in extra ethanol okra fruit can reduce blood glucose and serum insulin levels and improve glucose tolerance in obese rats.

Article 10 conducted by [14], with the title Administration of the crude hot water extract (dose: 500mg/kg). With an experimental method using experimental animals male Wistar rats weighing 150-200 g. And it was found that okra fruit improved the glucose tolerance of normoglikemic rats. The eleventh article was conducted by [6], under the title Literature review: Potency of Okra (*Abelmoschus esculentus* (L) Moench) as Antidiabetic. This type of research narrative method to analyze the potential of okra fruit as an anti-diabetic drug. From the results of the discussion in the journal, okra fruit is very influential on reducing blood sugar levels. Okra fruit has antidiabetic properties due to the content of flavonoid compounds around 18-22% and has antioxidant properties that act as an antidote to radicals [15]. Okra fruit also contains quarcetin 60-75% which has potential as an antidiabetic [4].

The twelfth article conducted by [16], entitled Antidiabetic potential of purple okra (*Abelmoschus escelentus L.*) extract in streptozotocin-induced diabetic rats. With the experimental method of randomized group design design, grouped into six groups: one normal control group, one diabetes control and four treatment groups. And the results were obtained in table 2 of the overall weight gain of the treatment group but not significantly, and between the treatment group with normal control dan DM kelompok tidak menunjukkan perbedaan yang signifikan.

The thirteenth article conducted by [17], with the title Evaluation of in vitro antioxidant activity of okra mucilage and its antidiabetic and antihyperlipidemic effect in alloxan-induced diabetic mice. With the experimental method with mucus extraction in okra fruit, the mucus yield was quite low compared to other studies following different extraction procedures. In the current study, the dry mucus yield of okra was 0.5% on average where other studies showed dry mucus yield of 1.25%-4% yield of *Abelmoschus esculentus* [18][19].

Fourteenth article conducted by [20], under the title A Review on Anti-diabetic properties of lady's finger (*Abelmoschus esculentus* L.) Plan. In this study described okra fruit as an antidiabetes mellitus drug and obtained the results of okra fruit containing flavanoids, glycosides, and

mucus; contains oxalic acid, proteins, fats, minerals (potassium, sodium, magnesium and iodine), carbohydrates, calcium and phosphorus. So it can help to lower blood sugar levels.

Fifteenth article conducted by [21], entitled Antidiabetic Activity of Okra Fruit (Abelmoschus escelentus (L) Moench) Extract and Fractions in Two Conditions of Diabetic Rats. With an experimental method with Dried okra fruit powder macerated in 96% ethanol for 5 days. The dry extract is then fractionated by liquid-liquid partitioning method, to obtain n-hexane, ethyl acetate also as a water-soluble fraction. Ethanol, n-hexane, ethyl acetate and water fractions showed antihyperglycemic effects in diabetic rats.

The sixteenth article was conducted by researchers [22], under the title A review on: Diabetes and okra (*Abelmoschus esculentus*). In this journal, AEPP and AESP were administered at 100 and 200 mg / kg doses in diabetic rats and showed a significant reduct-ion in blood glucose levels in diabetic rats.

The seventeenth article conducted by researchers [23], entitled Characteristics and Anti-Diabetics Activity off Jelly Drink Okra Mucus (Abelmoschus Escellentus L.) With the in vitro method by analyzing okra mucus as an antidiabetic to be processed into minjman jelly. The results are shown in Table 2. It appears that IC50 jelly drink ranges from 32.60 to 43.60 mg/L. The lower the IC50 value indicates the higher the inhibition of -glucosidase.

The eighteenth article was conducted by [24], entitled The effect of Okra (*Abelmoschus esculentus*) on lipid profiles and glycemic indices in type 2 diabetic adults: randomized double blinded trials. With the double-blind randomized clinical trial method obtained the results in table 3, that there were no side effects in patients with diabetes mellitus by consuming okra and researchers found results that consumption of okra can significantly reduce blood glucose levels in patients with diabetes mellitus.

Nineteenth article conducted by [25], under the title Antidiabetic Activity Of Okra (*Abelmoschus esculentus* L.) Fruit Extact. With an experimental method with experimental animals in the form of male rats aged 2-3 months weighing 20-30 g. And it was found that during insulin resistance in 14 days, IC50 values were obtained as inhibitors of glucosidase and alpha amylase enzymes.

The twentieth article was conducted by [26], under the title Nanoemulsion Of Okra Fruit Extact As Antidiabetic Treatment. In this study using an experimental design of antidiabetic activity in vivo with doses of 200 and 400mg / kg body weight and it was found that at doses of 400mg / kg body weight had blood glucose level reduction activity compared to doses of 200mg / kg body weight did not get significant results.

The twenty-first article by [27], entitled *Abelmoschus esculentus* (L.): Bioactive Components' Beneficial Properties-Focused on Antidiabetic Role-For Sustainable Health Applications. With secondary data collection methods to find out that okra has antidiabetic properties from several journals that have been selected by researchers.

CONCLUSION

Based on the results of the literature review and described in the previous chapter, it can be concluded that the material of the journals obtained about the relationship between the level of public knowledge about the benefits of okra fruit on diabetes mellitus at the time of the communityas follows: The relationship between the level of public knowledge about the benefits of okra fruit against diabetes mellitus among the community is very effective for lowering blood sugar levels from several journals that I read Okra fruit also has many benefits, one of which can lower blood sugar levels and also okra fruit is easy to get and the price is not too expensive. Non-pharmacological therapy in fruit is very good what else for people with diabetes mellitus.

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