Substance Dipeptidyl peptidase IV in Purple Sweet Potatoes to Maintain Blood Sugar Levels

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Abstract.
Diabetes mellitus (DM) is a chronic metabolic disease due to the pancreas not producing insulin effectively when blood sugar levels exceed normal values. Diabetes mellitus has typical symptoms consisting of polyuria, polydipsia, polyphagia, and weight loss for no apparent reason, while non-typical symptoms of DM include weakness, tingling, wounds that are difficult to heal, itching, blurred eyes, erectile dysfunction in men and in men. pruritus vulvar women. The World Health Organization (WHO) says that there are two ways to lower blood sugar levels, namely doing therapy by means of pharmacology and non-pharmacology. Which pharmacological therapy is with oral hypoglycemic drug therapy, insulin therapy or a combination of both. Non-pharmacological therapy consists of lifestyle changes that include physical exercise, education on various issues related to DM and most importantly, dietary regulation called medical nutritional therapy. One way is to consume purple sweet potatoes which contain high fiber. and low glycemic carbohydrates, also contain Dipeptidyl peptidase IV (DPP-4) Y which plays a role in the conversion of glucagon-like-peptide-1 (GLP-1) into its metabolites. Yangmana GLP-1 is a peptide hormone that plays a role in stimulating insulin release, so that inhibition of this enzyme can regulate blood sugar levels in people with Diabetes Mellitus.

1. Introduction

Diabetes mellitus (DM) is a metabolic disease in which the blood glucose level in the body exceeds the normal limit to reach ≥126 mg / dL [1]. Normal values of blood sugar levels should be in the range of 100-126 mg / dL after fasting for more than 8 hours, whereas 2 hours after breaking the fast, normal blood sugar levels should not be more than 200 mg / dL [2]. Blood sugar abnormalities occur because the body is unable to use and release insulin effectively [3]. Insulin is a hormone produced by the pancreas gland and works to control the metabolism of carbohydrates and glucose in the blood [4]. DM is divided into two types, if the pancreas is unable to produce insulin at all, then the patient will experience dependence on external insulation during life, this type is called type 1 diabetes, whereas if the pancreas is still able to produce insulin but in a small amount, it is called diabetes type 2 [5]. This disease is the most common prevalence every year has increased worldwide [6].

Based on data from the International Diabetes Federation (IDF), Indonesia has a vigilant status because it ranks 7th out of 10 countries with the highest number of diabetes patients. The prevalence of diabetes sufferers in Indonesia is 6.2%, which means there are more than 10.8 million people suffering from diabetes per 2020. The General Chairperson of the Indonesian Endocrinology Association (PERKENI, 2020), Prof. Dr. Dr. Ketut Suastika SpPD-KEMD said that this figure is expected to increase

to 16.7 million in 2045. With this year's dayta, where 1 in 25 Indonesians or 10% of Indonesia's population have diabetes. On May 14, 2020, the International Diabetes Federation (IDF) reported 463 million adults suffering from diabetes with a global prevalence reaching 9.3%. However, a dangerous condition is that 50.1% of people with diabetes are undiagnosed. This makes the status of diabetes as a silent killer still haunts the world. The number of diabetes is estimated to increase 45% or the equivalent of 629 million sufferers in 2045. And as many as 75% of people with diabetes in 2020 are aged 20-64 years. DM cases that are mostly found in Indonesia are DM type 2, where in the future this case will increase significantly. This is caused by several factors such as heredity, obesity, overeating, lack of exercise, and lifestyle changes [7]. Other symptoms that often arise include itching on the body and prolonged skin infections. Patients will also experience complaints such as increased appetite (polyphagia), high thirst (polydipsia), and increased urge to urinate (polyuria). These events are caused by the body trying to make glucose. In the long term DM can cause complications, in the form of microvascular disease including visual disturbances (diabetic retinopathy) and kidney damage (diabetic neuropathy). In addition, most of the sufferers consider that DM is not a serious problem, so that sufferers do not have the desire to regulate a healthy diet by implementing a diet program, this is what causes an increase in the number of DM sufferers [8]. In general, there are four ways in carrying out the DM program, the first is education, the patient must understand very well the history of DM, the second is in the form of a healthy diet, the patient must obey the diet he is living and must not exceed the limit, then exercise, exercise it is necessary to measure excess blood sugar levels in the body [9]. Various drugs and types of insulin have been found to treat DM, but the main treatment is proper diet management in promoting healthy eating to maintain blood sugar levels, especially in type 2 DM [10].

One way to do a healthy diet program is by consuming purple sweet potatoes. The Latin named is Ipomoea batatas L. belongs to the Convolvulaceae family and is often consumed by Indonesians as a source of carbohydrates, minerals, and vitamins. The phytochemical content in purple sweet potato is triterpenes, alkaloids, saponins, tannins, phenolic acids, and flavonoids [11]. Anthocyanin is a type of flavonoid that gives the purple pigment color to acylated tubers has better stability during storage [12]. Another example of a compound is dipeptidyl peptidase (DPP IV), where this enzyme plays a role in the conversion of glucagon-like-peptide-1 (GLP-1) into its metabolites. GLP-1 is a peptide hormone that plays a role in stimulating insulin release so that inhibition of this enzyme can help blood sugar levels in diabetics. Through inhibition of GLP-1 degradation by DPP IV inhibitors, endogenous GLP-1 will remain at normal so that it is made as an antidiabetic. Besides, the enzyme dipeptidyl peptidase in purple sweet potatoes has the ability to repair deteriorating organ systems in people with type 2 diabetes, making it a drug in maintaining blood sugar levels for diabetics.

2. Methodology

This research is an observational descriptive study with a case study approach to diabetes mellitus patients based on data from the International Diabetes Federation (IDF) in Indonesia on November 3, 2020. The method used is to retrieve data retrospectively from data shown by the Endrochronology Association (PERKENI). This writing is supported by books, journals, structural optimization of 3D Dipeptidyl peptidase IV (DPP-4) achieved with Chem3D using a personal laptop Model HP 14-ck0011TU Intel® Celeron® N4000 CPU 1.1GHz, 4.0 GB RAM, Microsoft Windows 10 Pro 64-bit with internet connection. Software (Chemical Computing Group ULC). Webserver https://phytochem.nal.usda.gov/,https://pubchem.ncbi.nlm.nih.gov/,http://www.swisstargetprediction.ch/, https://chemdraw-pro.software. informer.com/, the analyzed materials were obtained from the Phyochem and chanoclavine databases. Elymoclavine, ergine, ergometrine, and isoergine were retrieved from PubChem database. Material analysis was carried out on a swisstarger, predictions were made to see the content contained in Ipomoea batatas (purple sweet potato), namely Dipeptidyl peptidase IV where this compound functions in helping blood sugar levels for sufferers Diabetes Melitus. In the guide that Kitchenham has made in 2007[15], the literature review will be compiled based on the Systematic Literature Review.

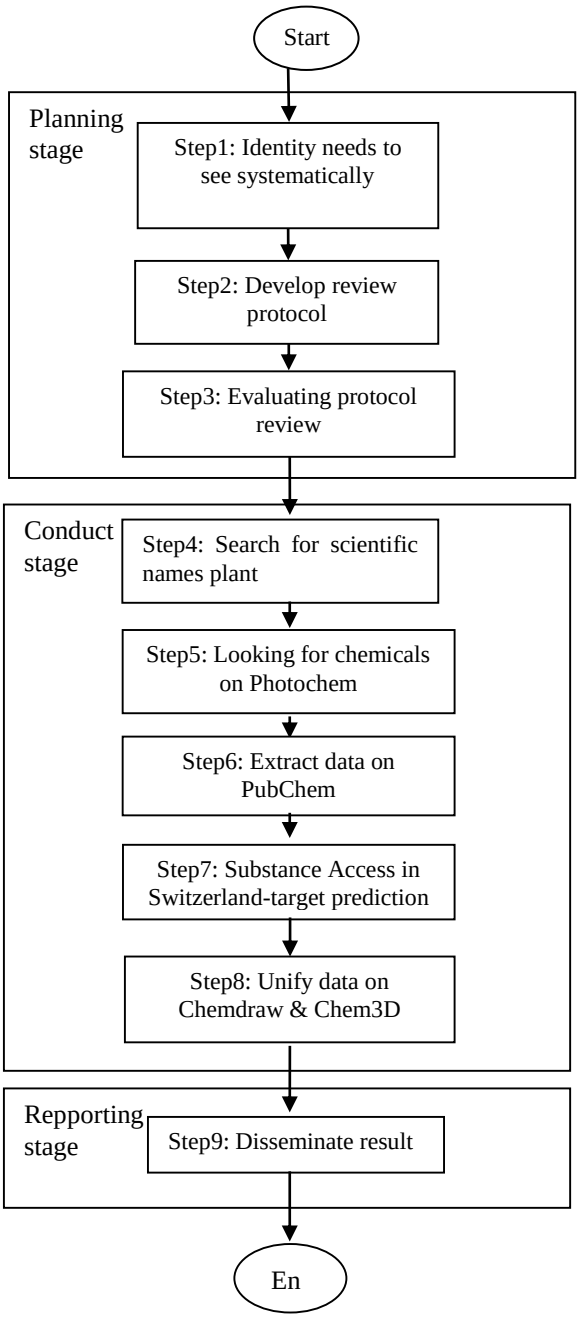

Figure 1. Systematic Diagram

Table 1.PICOC Criteria

Population	Diabetes
Intervention	International Diabetes Federation (IDF)
Comparison	-
Outcomes	Solve the problem of Diabetes Mellitus in the community
Context	A retrospective observational descriptive study

Table2. Research Question (RQ)

ID	Research Question	Motivation
RQ1	Which journal publishes the most research on Diabetes Mellitus?	Identifying the journal Endrochronology Association (PERKENI) about DM sufferers
		Identify active researchers in providing data on people with DM?
		The identification of the data set most commonly used for people with DM
		Identify the methods that have been used by previous researchers about maintaining blood sugar levels for people with diabetes?
RQ2	Who are the researchers who are most active in reporting on people with DM?	
RQ3	What is the most commonly used dataset to view DM sufferers?	
RQ4	What methods have been used by previous researchers	

Table 1 shows the design of the PICOC research question. The RQ in the literature review can be seen in Table 2. The schematic scheme can be seen in Figure 2.
The research implementation aims to utilize local plants as medicine in curing diseases. This is a descriptive observational study conducted in an objective way looking backward (retrospectively). Where the plants are taken is purple sweet potato.

Furthermore, the plants that were researched on Dr. Phytochemical and Ethnobotany Database. Duke with the scientific name Ipomoea batatas L. a service to see the chemicals in it, where the author took Ipomoes violence and got the chemicals Chanoclavine, Emyloclavine, Origine, Ergometrine, and Isoergine. That, one by one the chemical is extracted and the elements of the compound in the isomer are taken. SMILES After a collection of the elements of these compounds in Swisstargetprediction to see which proportion of the compounds is mostly contained. The next step is to Copy IUPAC Name on Pubchem earlier, and access Chemdraw, and unite it with Chem3d to see a 3D structure image and how much energy is produced.

The final step is to disseminate the chemical results obtained from the target prediction obtained in the form of the enzyme Dipeptidyl peptidase IV. Where this enzyme can play a role in the treatment of DM by helping blood sugar.

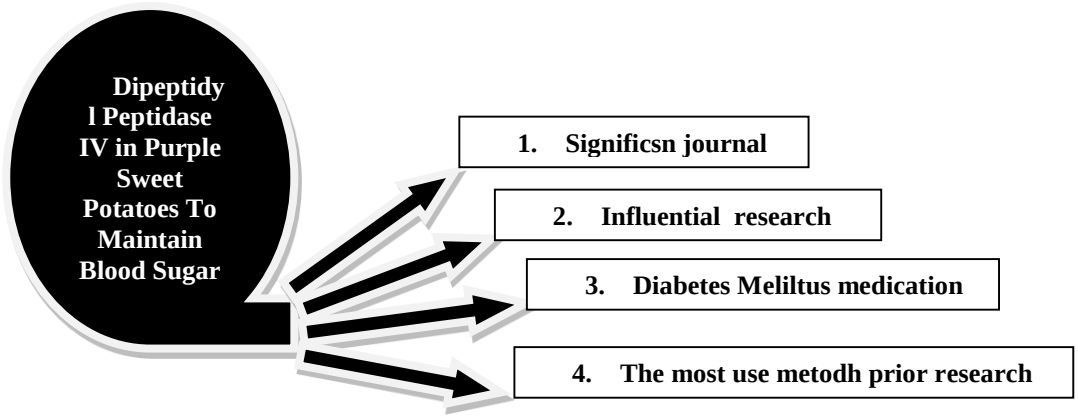

Figure 2. Mind map research

This research is based on the number of people who experience Diabetes Mellitus. Which, most people do not have a healthy diet and think that DM is seen from heredity only. In fact, the various factors that cause this disease are obesity, overeating, lack of exercise, and most importantly an unhealthy lifestyle.

Based on the observations that have been made with the large number of people who practice unhealthy lifestyles and do not read unhealthy diets, this scientific paper is written. To make us more productive again in carrying out activities without experiencing DM disease, complaints often occur who feel tired quickly.

In overcoming the problem of DM among the community, the authors urge to make lifestyle changes for the better. This can be done by exercising 3-4 times a week and reducing food portions. The point here is to reduce the food ratio that should be 3 times a day to 2 times a day, but this is done by replacing carbohydrates from rice. Because we both know that rice is a food that contains sugar, which can lead to obesity, we eat too much rice and can cause diabetes. In the event of such a problem, it is negligent if we replace the carbohydrates obtained from purple sweet potatoes. By eating purple sweet potatoes can maintain blood sugar levels in the body, because one of the substances contained in it is dipeptidyl peptidase which is an enzyme and protein binding found in various tissues including the liver, kidneys, pancreas, and endothelial cells.

3. Result and Discussion

As mentioned earlier, this literature review will be limited to journals published in 2010 through 2018. The time span is to see if research on the feature independence assumption on the Naïve Bayes method

is still relevant. In Figure 3 it can be seen that the trend of research from 2010 to 2016 has increased, so it can be concluded that research on the assumption of attribute independence on the Naïve Bayes method is still very relevant to date.'

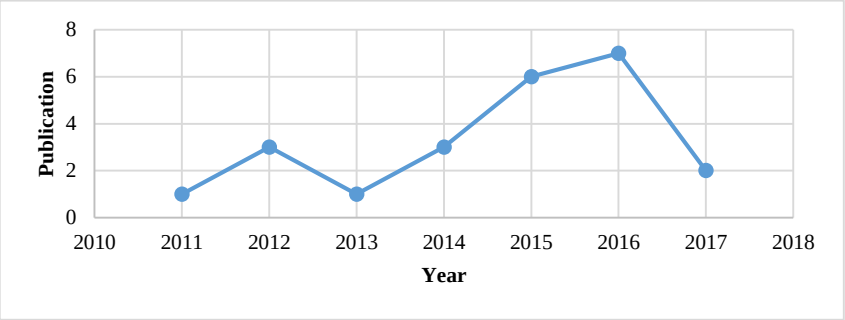

Figure 3. Publication Per-Year

Then in Figure 4 can be seen a journal that published a paper about the assumption of feature independence in the Naïve Bayes method. For the record, the journal in question is a journal that publishes papers that have been selected.

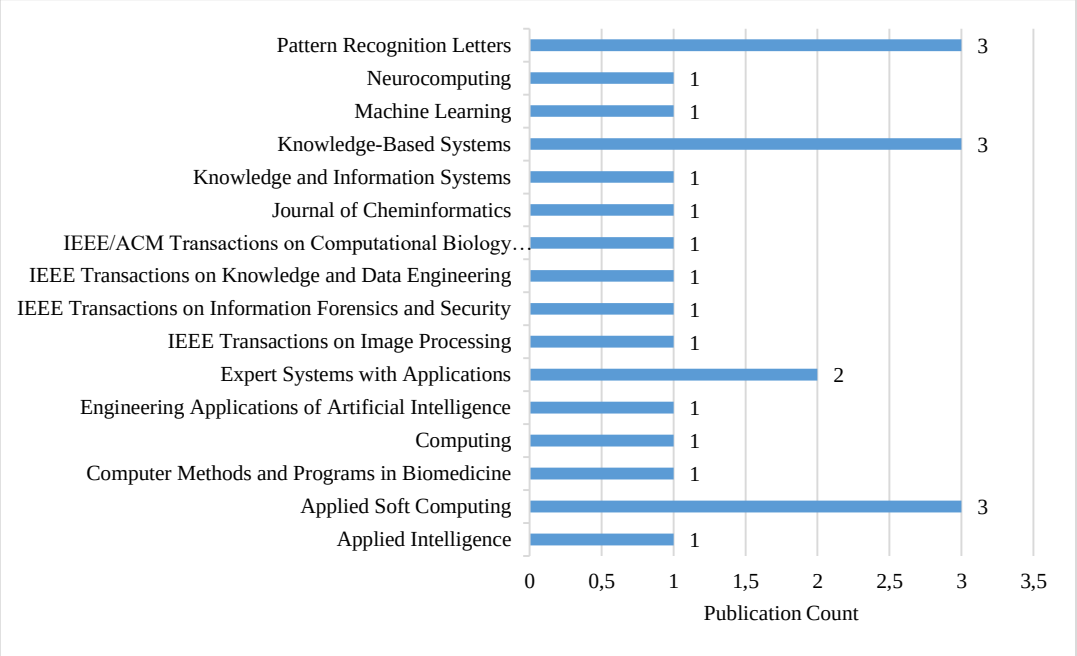

Figure 4. Number of publications per year

Contributing to the research topic on the assumption of attribute independence on the Naïve Bayes method will be investigated and identified. Figure 5 shows the most active researcher on research on the assumption of attribute independence on the Naïve Bayes method. The most influential researchers were Liang Xiao Jiang and followed by Lungan Zhang, and Shasa Wang. In addition it is not the first writer that is Chaoqun Li and Yang Xiang.

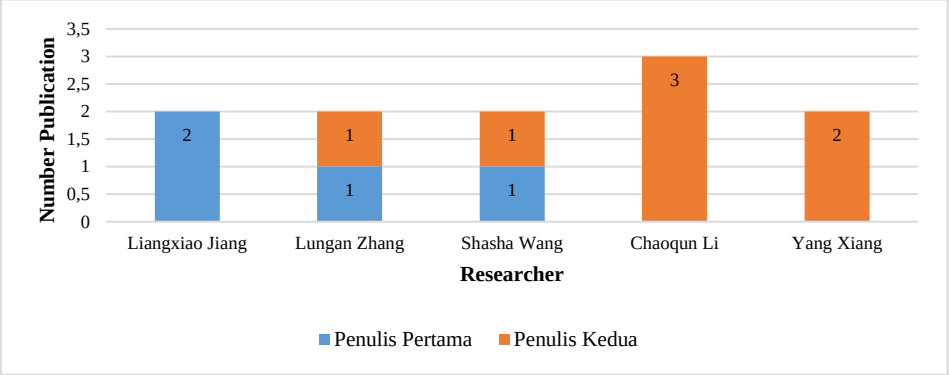

Figure 5. the Most Active and Influential Researcher

Figure 6 shows the percentage of total data sets used from 2010 to 2018. 70% of researchers use public datasets and 30% of researchers use private datasets. Public datasets are mostly accessible at the University of California Irvine (UCI) repository[13].

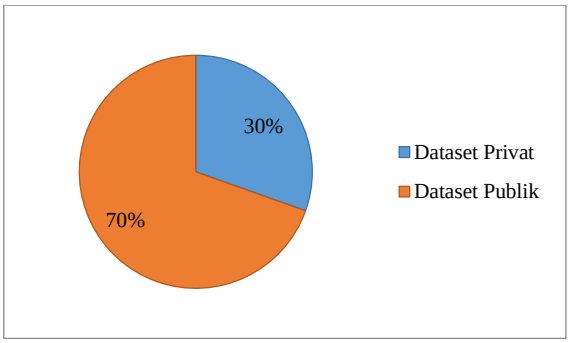

Figure 6. Dataset Distribution

The main study distribution over the years, and by source, is presented in Figure 7. More research has been published, and more public datasets have been used for research topics assuming attribute independence in naïve bayes since 2011.

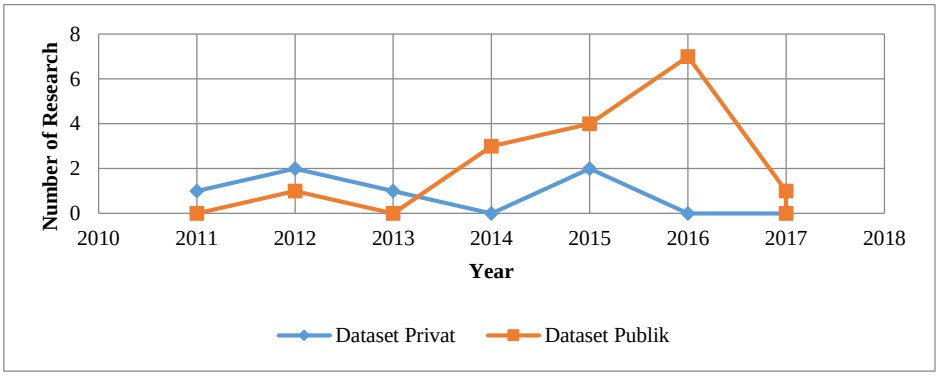

Figure 7. Distribution of private datasets and public datasets

On investigation, there are three strategies method approaches used to overcome the assumption of independence in naive bayes, including: 1) weighted strategies based on single correlation (Mutual Information (MI)[2], Attribute Weighted K-Nearest Neighboard (AWKNN) [17], Hidden Naïve Bayes (HNB)[3], Attribute weighted Naive Bayes using mutual information weighted method (MIWNB)[4], GRWNB [18]), 2) attribute weighting strategy using attribute correlation (like CFSWNB [19], SBC

[14], TreeWNB [15], ReFWNB, FDNB [16]), and 3) self-adaptive attribute strategy (like NACO DPGA, ES, SODE and AISWNB).

Some researchers propose several techniques to improve the accuracy of previously proposed classifier to overcome attribute independence on NB. This proposed technique has recently attempted to improve the prediction accuracy of methods generated by the modification and incorporation of several machine learning methods, add feature selection method[17]using several methods of optimizing evolutionary calculations.

Sixteen different methods have been applied to find the attribute independence solution on the NB method. Of the sixteen methods are found the most frequently used method of Mutual Information (MI)[2], metode Selective Bayes Classifier (SBC) [20], and Immune Systems based weighting scheme for Naive Bayes classification (AISWNB) method.

4. Conclusion

This literature review aims to identify and analyze the trends, datasets, methods and frameworks used in the topic of attribute independence assumption assumptions on NB between 2010 and 2018. Based on the inclusion and exclusion criteria designed, it shows 71 study studies of attribute independence assumptions on the published NB between January 2010 and December 2018 are investigated in this literature review have been conducted as a review of systematic literature. A systematic literature review is defined as the process of identifying, assessing, and interpreting all available research evidence in order to provide answers to specific research questions. The results of this study identified three of the most commonly used and influential framework methods in the topic of attribute independence on the NB. They are Menzies et al. Framework, Lessmann et al. Framework, and Song et al. Framework.

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