



Utilization of Antidiabetic Herbal Medicines Research Results as Adjuvant Treatment of Patients with Diabetes Mellitus Vulnerable to Covid-19 at the Elderly Posyandu, Sukoharjo Regency

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Abstract. The elderly and diabetes mellitus group are people who are vulnerable to exposure to Covid-19 infection. Therefore, they must maintain their blood sugar levels, so that they are always under control and their immune conditions are good. The elderly Integrated Healthcare Center (*Posyandu*) Mawar is a place for the elderly to share and check their health with each other, with more than 50 members. This community service activity aimed to apply anti-diabetic herbal medicinal products resulting from research that have been proven efficacious and safe. Implementation uses the Participatory Action Research (PAR) approach, namely the active involvement of elderly Integrated Healthcare Center participants to utilize anti-diabetic herbal medicinal products for supplementation of treatment and cared for diabetes mellitus (DM), education, and health checks in the form of measuring blood pressure and blood sugar levels. This activity was a collaboration of researchers, students, business actors (CV. Arba'in, product providers), and the community. The results of this activity showed that the elderly after consuming anti-diabetic herbal medicine combined with other herbal packages feel an improvement in their complaints and their blood sugar levels generally tend to decrease. The elderly after education understood about diabetes and how to control their blood sugar levels. In addition, they also understood how to use natural ingredients that were easy to find to maintain health, especially controlling blood sugar levels.

Keywords: Antidiabetic Herbal Medicines, Adjuvant Treatment, Diabetes Mellitus.

1 Introduction

Life expectancy in Indonesia in general has increased. This is indicated by the increasing number of elderly people. This also provides information that there is an increase

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in the economy and health in Indonesian society. Based on health profile data for Central Java Province, the percentage of the elderly is 12.34%, which is the second largest [1]. In Sukoharjo Regency, the number of elderly is 13.97% of the entire population. This large number must be accompanied by a health program because this group is vulnerable to infection and complications from existing diseases. Physiological conditions, organ function and immunity have decreased so that the most common diseases suffered by this group are non-communicable diseases. This figure consists of various diseases, based on data from the Ministry of Health of the Republic of Indonesia in 2016, one of which is quite large is diabetes mellitus. The prevalence rate of diabetes mellitus, based on data from the Central Java Provincial Health Office in 2017, is the second highest at 19.22%, and in Sukoharjo Regency the number of cases of diabetes mellitus is 4,964 cases [2].

Diabetes is characterized by high blood sugar levels, both fasting and fasting blood sugar, and high HbA1C values. This condition occurs because the endocrine system that regulates blood sugar levels in the body is not optimal, so medical treatment is needed. The number of people with diabetes mellitus in the world in 2019 is 463 million [3]. The prevalence of diabetes patients in Indonesia has reached 6.2%, which means there are more than

10.8 million people suffering from diabetes in 2020. This condition is a factor that triggers the severity when these patients are exposed to Covid-19. Practitioners pay serious attention to DM patients so that they are more stringent in maintaining health protocols and controlling their blood sugar levels. Blood sugar control is carried out in a disciplined manner, not only medication but also food intake and other health supplements. Therefore, there is a need for joint awareness and support in the form of education and assistance.

Indonesia has abundant wealth which is used for drugs or supplements to control blood sugar levels. One potential that has been studied and proven to be effective and safe in reducing blood sugar levels in alloxan-induced rats is Snakehead Fish (*Channa striata*) and Bitter Melon (*Momordica charantia L.*). The results of the study proved that administration of snakehead fish extract and bitter melon fruit could regenerate pancreatic islets of *Langerhans* tissue by 68.78% and succeeded in reducing blood glucose by 34.42% with an average blood sugar level on the 14th day of 100 mg/dL. The results of acute toxicity show that this combination is not toxic and in long-term use does not have an adverse effect on the body's important organs [4].

Therefore, in order to utilize research results and support government programs in reducing Covid-19 infection rates, this community service activity must be carried out as an implementation of anti-diabetic herbal medicines as a result of research for supplements for the treatment of diabetes mellitus, which is susceptible to Covid-19. The target group in this community service is the elderly group of Integrated Healthcare Center Mawar in the Baki sub-district. This activity carries the concept of participatory active research (PAR), where not only the researchers are active in the implementation but the community also plays an active role.

2 Method

In general, the concept used in implementing this community service is Participatory Action Research (PAR). Where the community is also actively involved in implementing the results of research on herbal medicines as a controller of blood sugar levels, it can also increase immunity. The PAR approach has three main pillars, namely the research methodology, the action dimension, and the participation dimension. PAR aims to spur the transformation of the introduced community. In its implementation there are business partners, who provide herbal medicinal products, researchers and students and community parties consisting of participants, the driving team and Midwives.

The stages are carried out so that the implementation is planned and directed in solving problems that arise, especially for the elderly who have diabetes mellitus. These stages consist of identifying problems and the elderly Integrated Healthcare Center community through the driving team and fostering midwives, then formulating actions and materials for community education, education on the use of research results to maintain blood sugar levels in the elderly Integrated Healthcare Center community, health checks especially blood sugar levels, provision of companions herbal medicine research results in controlling blood sugar levels, education on the use of local materials that are easy to use in assisting the treatment of diabetes mellitus, checking blood sugar levels after one week of taking the herbal medicine provided, and evaluating testimonials from representatives of the elderly Integrated Healthcare Center.

3 Results And Discussion

3.1 Profile of blood sugar levels of elderly Integrated Healthcare Center participants

Based on the Fig. 1, the majority of elderly rose Integrated Healthcare Center participants are in quite good condition, although the majority are still in the range that needs to be watched out for because if their diet is not controlled, their levels will rise more quickly. There are 8% of other participants who have blood sugar levels of more than 200 mg/dL, this indicates a condition of poorly controlled blood sugar. After the medical examination, all were given supplementation in the form of herbal medicine consisting of multiflora honey, black cumin capsules and antidiabetic herbs. The use of herbal medicine packages is given for 1 week which is taken regularly.

After the participants were asked to maintain and control food intake and drink herbal packets regularly, blood sugar was checked again. The examination results showed a decrease in blood sugar levels (Fig 2). Obstacles arose during the second examination, namely the presence of other participants who at first did not participate in the examination on the second opportunity to participate, but the condition of these participants was quite good.

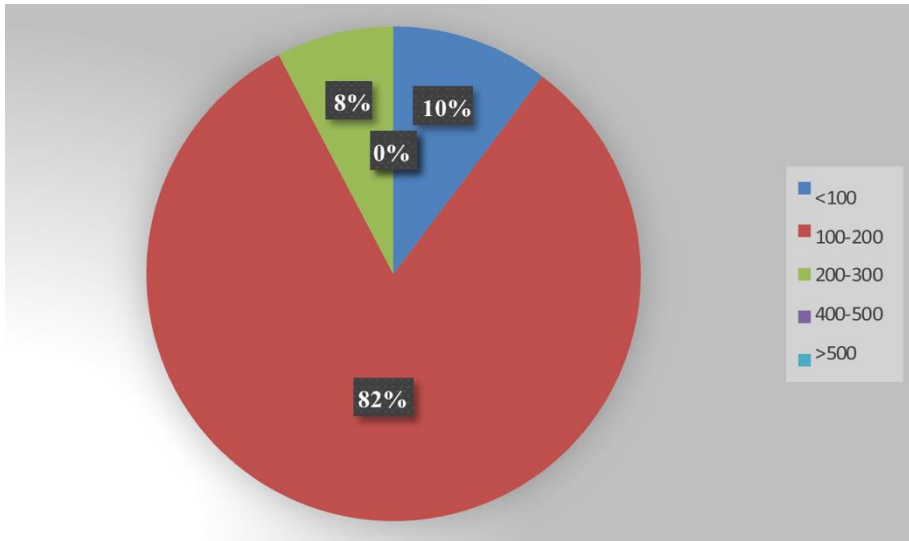


Fig. 1. Blood sugar profile of the elderly Mawar Integrated Healthcare Center participants before administration of anti-diabetic herbal medicine

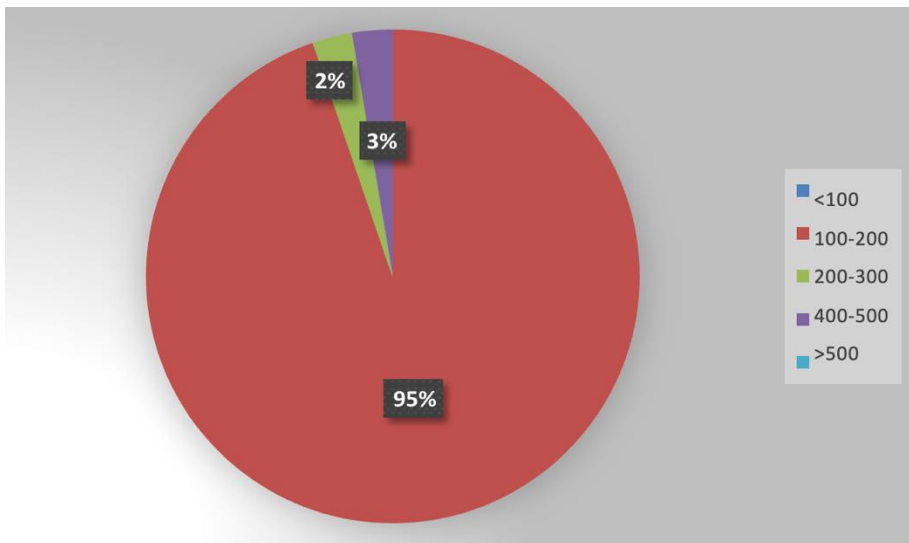


Fig. 2. Blood sugar profile of the elderly Mawar Integrated Healthcare Center participants after administration of anti-diabetic herbal medicine

3.2 Implementation of herbal medicine research results in community service activities

The implementation of research results on herbal medicines for diabetes mellitus at the Integrated Healthcare Center for the elderly in Mawar was enthusiastically received by

both the participants and the driving team and activator midwives (Figure 3). Educating the public, especially the Integrated Healthcare Center community for the elderly, about herbal medicines is not difficult because the material being socialized is a product that has proven its effectiveness and safety. Toxicity test results did not show any animal death in acute and sub chronic administration, the histopathological results of important organs showed no damage or abnormalities.

The results of discussions with the driving team and activator midwives found that there were obstacles in the Integrated Healthcare Center for the elderly, namely the lack of detection of high blood sugar and blood pressure quickly. This is due to the cost factor and the meeting schedule which is once a month. Other information that is important to be conveyed by the service team, students and lecturers, is the strategy and how to manage it so that blood sugar levels and blood pressure can be controlled. One strategy is to manage stress because it is a strong factor in causing an increase in blood sugar levels or high blood pressure. Sports activities are also carried out during regular meetings in adequate housing grounds. To anticipate the absence of ready-made herbal medicines, the participants of the Integrated Healthcare Center for the elderly were given education on how to use materials around us to control blood sugar and high blood levels, such as using bitter melon for making infusions, using moringa leaves, and others. The information provided is related to how to cook, dosage and how to drink the preparations made.

Based on data on blood sugar levels before being given herbal medicines, it was found that supplementation of herbal medicines could control blood sugar levels, and the most important thing was an improvement in the symptoms suffered. For example, there is a participant, Mr. (65 years old) who suffers from tingling and pain in his hands. The results of the examination of normal blood sugar levels. After one week of taking the herbal medicine, he was given he felt a change in improvement, and when he checked after one week the pain was gone, so we recommended that the dose of taking the herbal medicine be reduced. Another participant, a mother (62 years old) who used to go to the hospital for control due to a pandemic, did not dare to control it, so the herbal medicine packages and information on the use of natural materials around her were very helpful in maintaining her blood sugar levels and the condition of her immunity.

The management of the Integrated Healthcare Center for the elderly hopes that there will be togetherness from academics in educating them to maintain physical and mental health. So far, the once-a-month activity is filled with outreach from the Village Midwife, and this is felt to be lacking. The general description of the health condition of the participants in the Integrated Healthcare Center for the elderly is quite good, it's just that more intensive monitoring is needed so that unfavorable conditions are immediately detected. This result is also in line with another study by Jannah [5] who conducted research at the Mojolaban Health Center, that most people with diabetes mellitus are in a state of good quality of life. The activities of the Integrated Healthcare Center for the elderly in Pandeyan, like other Integrated Healthcare Centers in Sukoharjo District, Bulu District [6], are still not optimal. In addition to the Integrated Healthcare Center cadres who are still limited, support for infrastructure and operational costs are also obstacles.

The Integrated Healthcare Center community for the elderly found it very helpful, namely knowing the condition of each blood sugar level and experiencing a decrease after taking anti-diabetic herbal medicine for 1 week. Participants also became aware of how to use natural materials around them to control blood sugar levels and help maintain body immunity. The hope is that with the introduction of research-based products and ways to use natural resources/materials around you, blood sugar levels are controlled and immunity is well maintained, so that the risk of severity when exposed to Covid-19 becomes lower.



A. Socialization and education of anti-diabetic herbal medicines



B. Checking blood pressure and measuring blood sugar levels



C. Delivery of anti-diabetic herbal packages to the participants of the Integrated Healthcare Center for the elderly, Mawar



D. Dialogue with participants after a week of using anti-diabetic herbal medicines at the Integrated Healthcare Center for elderly, Mawar

Fig. 3. Photo Documentation of Community Service Activities

This study is supported by previous research by Aljohi et al. [7] that bitter melon extract has many amino acids that inhibit carbonyl groups during the protein glycation process. According to Wang and Ryu who researched on bitter melon extract on mice, it was found that bitter melon extract can reduce lipid peroxidation. Research by Suhendi et al. [8] using snakehead fish extract on Wistar found that albumin 25 in snakehead fish can inhibit lipid peroxidation. The research by Muhtadi and Pangestuti in 2019 [9] using extracts of bitter melon and snakehead fish on hyperglycemic rats found that the combination of ethanol extract of bitter melon at a dose of 300 mg/kg BW and snakehead fish powder at a dose of 300 mg/kg BW could lower blood sugar levels higher than administration of ethanol extract of bitter melon, and 300 mg/kg BW and snakehead fish 26 powder 300 mg/kg BW single [10].

3.3 Benefits obtained by partners in the implementation of community service activities

This community service activity was also carried out by involving partners from the Business and Industrial, namely CV. Arba'in Jaya Mandiri who has practical experience and legal permits to produce and market herbal medicines that have received certification from BPOM RI. This community service activity can be used as a model for implementing research-based collaborative learning. From the results of previous studies, prototypes of anti-diabetic herbal medicinal products based on extracts of snakehead fish (*Channa striata*) and bitter melon (*Momordica charantia*) have been obtained which are effective and safe to help lower blood sugar levels in DM patients.

The implementation of this community service activity as a whole received a very good response, from Integrated Healthcare Center participants, Integrated Healthcare Center cadres and midwives from the Baki Health Center. Several participants who previously did not know that they had high blood sugar levels, with routine and planned assistance, blood sugar levels can be identified and monitored for participants in the Integrated Healthcare Center. This has a very positive economic and social impact on the participants, because the health of the participants in the Integrated Healthcare Center is relatively well maintained if they are accompanied and carry out routine checks and education.

This community service activity contributes to other sectors, especially to the psychological aspects of Integrated Healthcare Center participants so that they are more confident and confident in treating their DM disease. The Integrated Healthcare Center participants, who are almost all aged over 60 years, show greater motivation and an increasing spirit of togetherness.

3.4 Constraints encountered and follow-up plans

During the implementation of community service activities there were no significant obstacles. Obstacles that may have an effect are that the elderly cannot participate in educational activities for a long time and the availability of reagents for health checks is still limited. The obstacle faced by students is mainly language, where the elderly are used to smooth Javanese, but this is not a major obstacle because the elderly are also used to Indonesian. Another thing that is an obstacle is the time of implementation which is usually done in the morning because they have finished their activities at home, while the lecturers and students at that time are usually for lecture activities.

It is hoped that positive results from the implementation of this activity can be developed and felt by other Integrated Healthcare Center communities for the elderly. And for the continuation of this program, it is carried out with more intensive coordination between researchers and village midwives and the coordinator managing the Integrated Healthcare Center for the elderly to improve the standard of other health.

4 Conclusion

After the implementation of community service activities, Participants from the Integrated Healthcare Center for the elderly Mawar after taking anti-diabetic herbal medicines experienced a decrease in blood sugar levels and also felt a positive effect on body health. Understanding, knowledge and how to use herbal medicines that are available and easy to find in the surrounding environment has increased.

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