Foot Exercise Improve Plantar Reflex and Prevent Ulcers on Diabetes Melitus Patients

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ABSTRACT

Background: Diabetes is a disease that is complete because it can damage all the organs begin to head to toe. One of the actions that can be given to prevent of ulcers in patients with diabetes mellitus is diabetic foot exercise. The long term goal of this research is know the effect of exercise on prevention of ulcers in patients with diabetes mellitus.

Methods: The study design used is Pre Experiment Design (Pre-Post Test Design). The study population was all patients with type 2 diabetes mellitus by the number of samples in the amount of 36 respondents, data retrieval using purposive sampling technique. The collection of data for measurement of plantar reflex and ulcer using observation instruments plantar reflex and the degree of ulcers. This study data analysis using statistical test Chi square and Wilcoxon signed ranks test.

Result: Showed that the plantar reflex was increased and no one of respondents get foot ulcer after doing diabetes mellitus foot exercise.

Conclusion: It can be concluded that diabetes mellitus foot exercise can increase the plantar reflex and prevention of ulcers in patients with diabetes mellitus.

Keywords: Foot exercise, Plantar reflex, Ulcer, Diabetes mellitus

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I. BACKGROUND

Diabetes mellitus is a clinical syndrome of metabolic abnormalities, characterized by hyperglycemia caused by insulin secretion defects, insulin working defects or both. If not treated properly, the incidence of complications of chronic diabetes mellitus will increase. Complications that often arise in the form of injury caused by a blunt or sharp trauma that is not healed, because of hyperglycemia in people with diabetes mellitus that causes abnormalities of neuropathy and abnormalities in blood vessels resulting in feeling numbness in the fingers and soles of patients with Diabetes mellitus, sometimes muscle tone of the hands and feet have weak muscle strength of weakened arms and legs, the hands and feet are deformed.

According to WHO, patients with diabetes mellitus in Indonesia will increase from 4.5 million patients in 1995 to 12.5 million people with diabetes mellitus in 2025 and ranked 5th in the world. In dr. Cipto Mangunkusumo Hospital obtained most of the treatment of people with diabetes mellitus always involves diabetic gangrene who has a very high percentage of death 16% and 25% amputation rate (Waspadji, 2009). The suffering of people with diabetes mellitus has not ended, after the operation of their condition will still be worsening. 14.3% patients will die for 1 year after amputation, and 37% will die 3 years after amputation. From the data of diabetic polyclinic patients at dr. Soetomo Hospital was 30.6% of people with diabetes mellitus had a neurological disorder (Tjokroprawiro, 2010). From the results of pre-research in the working area of Puskesmas Pesanten I Kediri, 8 of 10 patients with diabetes mellitus type II experience numbness on the sole of the foot.

Diabetes mellitus may be associated with one of the effects of insulin deficiency that can not maintain abnormal pre-prandial blood sugar level. In severe hyperglycemia exceeding the normal kidney strength threshold of 160-180 mg / 100ml will result in glycosuria because the renal tubules
can not absorb all glucose. This glucose will result in osmotic diuretics that cause polyurias with loss of sodium, chloride, potassium, and phosphate. The old hyperglycemia will cause arteroklerosis, thickening of the basement membrane and changes in peripheral nerves. This will lead to the easy going of gangrene (Wijaya, 2013). Patients with diabetes mellitus often have neural problems especially on the peripheral nerves in the legs, this originates from the presence of hyperglycemia in people with diabetes mellitus that causes neuropathy disorders, both sensory and motor neuropathy and autonomic will result in skin and muscle changes, which then leads to change distribution of pressure on the soles of the feet and subsequent pressure resulting in the occurrence of ulcers (Sarwono, 2009).

Diabetes mellitus can be done a precaution. According to WHO, efforts to prevent diabetes mellitus can be done with the provision of counseling diabetics suffered lack of sensitivity in the form of encouraging to use soft footwear to reduce the risk of thorns and other trauma, and avoid the use of jagged footwear or so-called “sandal” therapy, the footwear can lead to a passive pressure for too long which negatively impacts the small blood bands on the feet. For vascular problems can be done a exercise or leg exercises to stretch the muscles and facilitate blood circulation in the legs. Exercise or foot exercises can increase the blood circulation in the legs, strengthen the leg muscles, prevent foot deformities and increase leg muscle strength, thighs, and overcome joint movement.

Previous research conducted by Putri, et al (2013) concluded that Diabetes Mellitus patients need to do self-management, among others, monitor blood sugar levels, diet, medication, exercise and foot care.

A European study focusing on IDDM (Insulin Dependent Diabetes Mellitus), the EURODIAB IDDM connects peripheral neuropathy with a pattern of blood sugar levels and Diabetes Mellitus duration. A total of 30% of DPN is associated with HbA1C. However, the value varies between 17-41% after adjustment for the duration of DM, although the pattern of regulation of blood sugar levels is good (Tesfaye S., 2004).

It is estimated that there are other factors that underlie the emergence of neuropathy. Neuropathy is associated with a variety of risk factors including age, male gender, poor sugar content, lipid value index and blood pressure, duration and severity of patients experiencing Diabetes Mellitus (Parisì, et al, 2016). Epidemiological studies have shown that poorly controlled sugar levels increases the risk of neuropathy (Sjahrir, 2006).

Clinical symptoms of peripheral neuropathy depend on the pathophysiological mechanism and anatomic location with peripheral nerve damage. The nerve damage includes three nervous system disorders: sensory, motor, and autonomic nerves. Sensory disturbance causes loss of sensation or feeling numb. Numbness will cause trauma that occurs in people with diabetes is often unknown. Motor disorders cause muscle atrophy, foot deformities, changes in foot biomechanics, and pressure distribution will be disrupted resulting in increased incidence of ulcers. Autonomic disorders cause the legs to decrease the excretion of the sweat so that the skin of the feet becomes dry, fissure and callus formation (Deli G, 2014).

The most common adverse effect of peripheral neuropathy is DFU (Diabetic Foot Ulcer). DFU can occur due to trauma to the process of peripheral neuropathy and if it continues until bone infection occurs then the patient will be at risk of leg amputation (Soheilykhah S., 2014). A study in the United States shows that about 15% of DM patients have experienced at least one DFU case during life. The study also found that about 60-70% of DFU incidence originated from the incidence of neuropathy (Gordois A., 2013). Diabetesi with neuropathy will increase the risk of diabetic ulcers seven times higher than those without neuropathy (Soheilykhah S., 2014).

Examination to know the existence of peripheral neuropathy has never been done in primary health care (Bansal D, et al, 2014). The phenomenon can also be found in Pesantren I Health Center Kediri, where nurses never perform simple foot examinations (callus and foot examination) until foot examination requires equipment and special skills. Nurses need to pay particular attention to people with diabetes to prevent worsening of neuropathy. Such prevention efforts are necessary to prevent the development of neuropathies that will have an even worse impact on amputations and deaths. Prevention of worsening of neuropathy may be done by early prevention. One form of early prevention efforts is to perform peripheral neuropathy checks. The examination of plantar reflex and
ulcers are important because there are still many diabetics who ignore the symptoms of neuropathy. Based on the phenomenon, the researchers are interested in conducting this research.

II. METHOD

Based on the research objectives, the research design used is Pre Experimental (One-group Pre-Post Test Design). The subjects in the study were 36 respondents. In this research the sampling technique used is non-probability sampling with the type of purposive sampling. Respondents were treated with foot exercises.

Before foot exercise, we need to prepare tool such as 1 sheet newspaper, and chair (if the action is done in a sitting position). The foot exercises procedure is given as follows:

1) Handwash your hands.
2) If done in a sitting position then position the patient sitting upright on the bench with feet touching the floor.

3) By putting the heel on the floor, the fingers of both legs straightened up and then bent back down like a chicken scratch 10 times.

4) By placing the heel of one foot on the floor, lift your feet upwards. On the other foot, the toes are placed on the floor with the heel of the foot lifted up. This is done simultaneously on the left and right legs alternately and repeated 10 times.

5) The heel legs are placed on the floor. The end of the foot is lifted up and make a circular motion with the movement on the ankle as much as 10 times.

6) Toes are placed on the floor. Lift the heels and make a circular motion with the movement of the ankle 10 times.
7) Raise one leg of the knee, and straighten it. Movement of the fingers forward down again alternately left and right. Repeat 10 times.
8) Align one foot on the floor then lift the foot and move the tip of the toe toward the face and then lower back to the floor.
9) Raise both legs then straighten. Repeat step 8, but use both legs at the same time. Repeat 10 times.
10) Lift both legs and straighten it, keeping the position. Movement of the ankle forward and backward.
11) Align one leg and lift, turn the foot on the ankle, write on the air with feet from the numbers 0 to 10 do in turn.

12) Put a newspaper on the floor. The shape of the paper became like a ball with both legs. Then, open the ball into a sheet as before using both legs. This method is done only once. Then torn the newspaper into 2 parts, separate the two parts of the newspaper. Some of the torn newspapers are small with both legs. Move the torn bundles with both legs and place the paper in a piece of paper. Wrap it all up with both legs into a ball shape.

Data collection for blood sugar level measurement using glucose test. Respondent’s demographic data were collected by interviews in the form of direct questions to the research subjects. The data were collected by measuring plantar reflex with hammer reflex and observing the degree of ulcer and writing on the observation sheet before being given the Diabetic Foot Exercise 3 times a week and done for 2 weeks in a row. In the second week, a post test with plantar reflex and observed the degree of ulcer and written on the observation sheet.

The data has processed to test the research hypothesis. The statistical test used is Wilcoxon Signed Rank Test. The results will be compared between before and after treatment to know the Potency of Diabetic Foot Exercise Against Plantar Reflex and Ulcer Prevention of Type 2 Diabetes Mellitus Patients in Puskesmas Pesantren 1 Kediri.

### III. RESULT

<table>
<thead>
<tr>
<th>Plantar Reflex</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>%</td>
</tr>
<tr>
<td>Tidak ada reflek</td>
<td>26</td>
<td>72.22</td>
</tr>
<tr>
<td>Ada</td>
<td>10</td>
<td>27.78</td>
</tr>
<tr>
<td>Total</td>
<td>36</td>
<td>100</td>
</tr>
</tbody>
</table>

From table 1, the respondents before the exercise of foot exercises obtained the most results is 26 respondents (72.22%) has no reflex plantar. Data of respondents after exercise exercise obtained 58.30% of the results of 21 respondents have plantar reflexes.
Table 2. Ulcers of Diabetic Patients Before and After Diabetic Foot Exercise in Puskesmas Pesantren 1 Kediri 16 May – 30 June 2016 (n=36)

<table>
<thead>
<tr>
<th>Ulcers</th>
<th>Before</th>
<th></th>
<th>After</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>%</td>
<td>F</td>
<td>%</td>
</tr>
<tr>
<td>None</td>
<td>36</td>
<td>100</td>
<td>36</td>
<td>100</td>
</tr>
<tr>
<td>Ulcers</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>36</td>
<td>100</td>
<td>36</td>
<td>100</td>
</tr>
</tbody>
</table>

From table 2, before diabetic exercise on the respondents obtained the results of observations of all respondents a number of 36 people (100%) did not have ulcers. And after the exercise all respondents had no ulcers.

Table 3. Statistical Test of Plantar Reflex Sebelum dan Sesudah Before and After Diabetic Foot Exercise in Puskesmas Pesantren 1 Kediri 16 May – 30 June 2016 (n=36)

<table>
<thead>
<tr>
<th>Plantar Reflex</th>
<th>Z</th>
<th>Asymp. Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-3.051b</td>
<td>0.002</td>
</tr>
</tbody>
</table>

From table 3, it is known that $p = 0.002$, it is concluded that there are differences plantar reflex before and after diabetic foot exercise on the respondents.

IV. DISCUSSION

Potency of Diabetic Foot Exercise to Improve Plantar Reflex

The result of the research in the working area of Pesantren 1 Kediri Health Center at the respondents plantar reflex condition before the exercise of foot exercises Diabetes Mellitus majority no reflex plantar that is 26 respondents (72.22%) and after the foot exercises there are only 14 respondents (38.89%) has no plantar reflex.

Based on the results of research age most ranges 60-74 years ie 18 respondents (50%). Age is closely related to the increase in blood glucose levels, so the more age increases the prevalence of Diabetes and impaired glucose tolerance is higher (Goldberg and Coon in Price 2009). Blood sugar levels can fluctuate, meaning up and down all day and every time, depending on the incoming food and physical activity of a person. International Diabetes Federation (IDF) criteria, if the blood sugar at fasting time is above 126 mg / dl and two hours after eating above 200 mg / dl, that means the person suffering from Diabetes Mellitus (American Diabetes Association in Tandra, 2014). High blood sugar levels can injure nerve fibers, usually on the feet. Age is a precipitating factor of increased blood sugar levels so that the risk of diabetes increases with age, especially after the age of 40 years. Usually at the age of 40 years tend to be relaxed and less mobile so that the body began to fat and began a complaint caused by Diabetes Mellitus (Tandra, 2014). From the theory can show that age can affect the increase in blood sugar levels that affect the lower reflex plantar Diabetes Mellitus patients.

Based on the results of research most of the respondents are women because the majority are housewives who have a lot of free time. Respondents of female gender were 29 respondents (80.56%). The study from Carine (2014) that be done to 80 respondents, found that 18.5% has reflex disorders. Hasil it has suitable with studies that found patient diabetes mellitus have disorders on tendon such as *achilles*. Decrease or absent of *achilles* reflex because of small fiber damage. Atrophy of intrinsic muscle will affect the motor nerves. There can be weakness in the legs.
and limitations of joint motion due to accumulation of collagen under the dermis, resulting in stiffness in the toes and changes in the shape of the toe (Mario, 2009).

Based on the results of research obtained the most respondents education is elementary school 13 respondents (36.11%). Based on these circumstances can be a factor that affects the limited knowledge related to Diabetes Mellitus. Efforts to prevent Diabetes Mellitus can be done is the provision of counseling Diabetes Mellitus sufferers who experience a lack of sensitivity in the form of encouraging to use soft footwear to reduce the risk of pricked thorns and other trauma, and avoid the use of jagged footwear or so-called therapy sandals, the footwear can lead to a passive pressure too. For vascular problems can be done a exercise or leg exercises to stretch the muscles and facilitate blood circulation in the legs. Exercise or foot exercises can smooth the blood circulation in the legs, strengthen the leg muscles, prevent foot deformities and increase leg muscle strength, thighs, and overcome joint movement. In accordance with the results of research from Endriyanto (2012) which states that education is influential in maintaining the lifestyle of respondents to stay healthy because the higher the level of education the higher the ability of a person to maintain healthy lifestyle, which includes discipline in diet, discipline in control to health services to check blood sugar levels, and also discipline to take medicine. So education also has an effect on the value of plantar reflexes on the feet, because the level of education can affect the ability of respondents in healthy living, in understanding the illness suffered, especially prevent further complications from Diabetes Mellitus.

Based on the results of research most of the respondents is not work, 22 respondents (61.11%). The majority of respondent’s occupations are housewives. The stress response due to unemployment and unemployment leads to the secretion of the sympathetic nervous system followed by sympathetic-medullary secretion, and if stress persists the hypothalamus-pituitary system will be activated and will secrete corticotropin releasing factor that stimulates the anterior pituitary producing adrenocorticotropic hormone (ACTH). ACTH stimulates the production of cortisol, which affects elevated blood glucose levels. Although not known with certainty the relationship, but the stress of not working can trigger an increase in blood sugar levels (Price, 2009). Blood sugar levels can affect the nerve damage caused by blood sugar can trigger the presence of diabetes neuropathy that can cause pain, numbness, disorders of the digestive tract, urine, blood vessels and heart.

Based on the result of research that most of the respondent's effort to increase plantar reflex is just ignore to 15 respondents (40.54%). This is due to the limited level of education, knowledge and ability of the respondents in obtaining information related to the management of Diabetes Mellitus disease so that there is no attempt to improve plantar reflexes.

Based on the results of the study showed that more than 50% of respondents have a history of routine checks are 23 respondents (63.89%). This is also supported by the regular participation of respondents in the presence of Elderly Posyandu coordinated by Puskesmas Pesantren I. Generally, people with Diabetes Mellitus who do not routinely take the drugs do not routinely come to the Puskesmas by reason of the distance of the house with the Puskesmas is too far and no one to deliver.

Based on the results of the study showed that more than 50% of respondents are not routine in the medication compliance of 19 respondents (52.78%). This is influenced because the respondent treatment if there is a physical complaint. Generally, people with diabetes mellitus who undergo treatment is a patient whose blood sugar levels have reached the limit that can be tolerated, so it has caused physical symptoms such as nephropathy, retinopathy, and neuropathy. Based on the results of the interview, generally people with diabetes mellitus who do not routinely take the drugs do not routinely come to the Puskesmas by reason of the distance of the house with the Puskesmas is too far and no one to deliver, other than that there is a claim that the drug consumed has run out and his body does not show the presence of symptoms so there is no reason for the elderly to regain control or stop the treatment itself.

Based on observations during Diabetes Mellitus foot exercises on Diabetes Mellitus type II, there are some respondents in the process of treatment of exercise in the tearing up the newspaper has increased where the majority of respondents can tear well and quickly, indicating that muscle strength in the legs of respondents has increased. Good patient plantar reflexes and elevated plantar reflexes have blood sugar values below 250 with a momentary blood sugar status. And from the respondents who experienced a change from no reflexes to have a reflex caused because the blood sugar levels of respondents has increased with a very high value. The results of the plantar reflex examination after


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the exercise of Diabetes Mellitus foot exercises increased plantar reflexes. Plantar reflex increased due
to discipline respondents in doing physical exercise in the form of foot exercises Diabetes Mellitus.

Diabetes Mellitus foot exercise performed by respondents for two weeks. Exercise Diabetes Mellitus is done to improve blood circulation that is blocked due to blood that contains lots of sugar or so-called hyperglycemia, strengthens small muscle muscles so that reflexes in patients with Diabetes Mellitus increase, prevent foot deformities, increase calf and thigh muscles, overcome the limitations joint motion. This gymnast uses newspaper media, which newspaper media will be used in
the process of training the small otat part of the finger. This exercise is done at least 2-4 times a week
with a duration of 15-30 minutes.

Based on the results of research that has been done on 36 respondents obtained by plantar reflex before and after. Plantar reflex was measure using hammer reflex. Respondents who did not have plantar reflexes changed to have plantar reflexes occurring in 11 respondents, then the value of respondents who did not have plantar reflexes remained no plantar reflex as much as 15 respondents, then the previous plantar reflex value of previous respondents no plantar reflexes no plantar reflex number of 10 respondents, then no respondent experiencing plantar reflexes turns into no plantar reflex. After doing the Wilcoxon statistical test processing with computer software with significance level set is α <0.05 got result value p = 0.002, hence result value of data that is p <0,05 which mean H1 accepted, there is potential of foot gymnastic Diabetes Mellitus to the increase of plantar reflexes on respondents Diabetes Mellitus type II in the work area of Pesantren 1 Health Center of Kediri. This means that doing foot-trained Diabetes Mellitus with a newspaper can help improve the leg sensitivity of Diabetes Mellitus respondents.

Plantar reflexes are a scouring of the skin of the sole of the foot which will give rise to a plantar flexion reflex of the feet and flexion of all toes in most healthy people (Muttaqin, 2008). The reaction consists of the development and extension of the toes as well as the elevation of the upper toe of the lateral palm foot which is often familiar with the sign of babinski (Muttaqin, 2012). Based on the research results of the potential of diabetes mellitus foot exercises on plantar reflexes and prevention of ulcers of type II diabetes mellitus patients (in the working area of Pesantren 1 pesantren), there was a significant increase of plantar reflex values before and after the increase of plantar reflexes p=0.002.

**Foot Exercise to Prevent Ulcers to Diabetes Melitus Patients**

The result of the research in the working area of Pesantren 1Public Health Centerall of the
respondents before foot exercise did not have ulcers that are 36 respondents (100%) and after
exercises of Diabetes Mellitus foot exercises all respondents still did not appear ulkus that is a number
of 36 respondents (100%).

Diabetes Mellitus is a collection of symptoms that arise in a person caused by an increase in
blood glucose levels due to a decrease in progressive insulin secretion from the backdrop of insulin retention (Sudoyo, 2009). Diabetes Mellitus often strikes on the feet, a common complaint experienced by sufferers is the pain, numbness and frequent discomfort. Microcirculation disorders will cause reduced blood flow and oxygen delivery in nerve fibers which then causes degenerasi of nerve fibers. This situation will lead to neuropathy, due to lack of oxygen supply, bacteria that will flourish especially anaerobic bacteria. This is because the diabetic blood plasma that is not well controlled has a high viscosity (viscosity), so that blood flow to be slowed down. As a result, tissue nutrition and oxygen are inadequate, causing injuries to heal and anaerobic germs proliferate (Misnadiarly, 2006).

Foot care in patients with Diabetes Mellitus is to avoid the occurrence of disorders that cause
the act of amputation (Waluyo, 2009). Foot care is part of the primary prevention effort in the
management of diabetic feet that aims to prevent injury (Soegondo et al, 2009). Primary prevention efforts include Diabetes Mellitus health education, complications and foot care, good nutritional status and control of Diabetes Mellitus, periodic Diabetes Mellitus Examination and its complications, Regular periodic foot examination, Prevention or protection of special shoe trauma, personal hygiene including legs, Elimination biomechanical factors that may cause ulcers. Based on the results of
interviews and questionnaires, efforts made by respondents to prevent Diabetes Mellitus ulcers such as Diet DM, used rest, take medication, and left.

Based on the observation, all respondents of 36 respondents (100%) did not have ulcers before doing Diabetes Mellitus foot exercises. After doing foot exercises Diabetes Mellitus a number of 36 respondents (100%) no ulcers. This shows that Diabetes Mellitus foot exercises can prevent the occurrence of ulcers. This can mean that foot care in people with Diabetes Mellitus is to avoid the occurrence of disorders that cause the act of amputation (Waluyo, 2009). Foot care is part of primary prevention efforts in the management of diabetic feet aimed at preventing injuries (Soegondo, 2006). Primary prevention efforts include Diabetes Mellitus health education, complications and foot care, good nutritional status and control of Diabetes Mellitus, periodic Diabetes Mellitus examination and its complications, periodic foot examination of the patient, Prevention or protection of special shoe trauma, personal hygiene including legs, Elimination biomechanical factors that may cause ulcers.

Daily foot care involves cleaning feet every day at a clean bath and shower soap. If necessary, rub the feet with a soft brush or floating stem. Dry the feet with a soft and clean towel including the area between the toes, especially between the third and fourth fifth fingers, giving moisturizer / lotion (lotion) on the dry leg so that the skin does not become cracked. But do not give a moisturizer on the sides of the toes because the sides of the fingers will become very moist and can cause the growth of fungus, straight toenail clippers follow the normal form of the toes, not too short or too with the skin, then sting so that the nails are not sharp. If vision is not good, ask someone else for help nailing or nailing every two days, wearing shoes or sandals to protect the feet from injury, also inside the house. Do not use flip-flops because they can cause blisters on the first and second fingers, using shoes or sandals that are good in size and comfortable to wear, with enough space in the shoes for the fingers. Wear socks / stockings that fit and clean made of cotton-containing material, Check shoes before wear, whether there are pebbles, sharp objects such as needles and thorns. Remove the shoes every 4-6 hours and move the wrist and toes to keep blood circulation good, especially in the use of new shoes, When using new shoes, remove shoes every 2 hours then check the foot condition, if there are minor injuries, treat wounds and cover with sanitary napkins. Check if there are signs of inflammation, Immediately to the doctor if the foot is injured and check the foot to the doctor on a regular basis (Soegondo et al, 2009).

Gym legs are recommended for diabetes mellitus patients do Diabetes Mellitus because based on research obtained until the end of the study respondents did not experience ulcers. The ulcer-free condition may be preserved or not appearing on the respondent. It proves that foot exercises can be used to prevent ulcers on the feet of Diabetes Mellitus patients.

V. CONCLUSION

The conclusion of this research is diabetes mellitus foot exercises potentially increase plantar reflex with previous plantar reflex result 72.22% decrease to 41.70% and no ulcer on all respondents until the end of the study on respondents who follow foot exercise diabetes mellitus.

VI. SUGGESTION

Elderly with diabetes mellitus can improve plantar reflexes and prevent ulcers by performing leg exercises regularly to keep the foot well, respondents can perform their activities without any complaints of pain or movement disorders. Advice for the elderly to motivate himself to regularly follow exercise foot. Families with Diabetes Mellitus should also be involved to provide support. Based on previous research found that patients who get good family support can run good diabetes self-management as well (Damayanti, et al, 2014).
VII. REFERENCES


