International Journal of Progressive Sciences and Technologies (IJPSAT)
ISSN: 2509-0119.

https://ijpsat.org/
Vol. 51 No. 2 July 2025, pp. 46-73

Elderly Patient's And Families Experiences In Caring For Diabetic Foot Ulcers In The Sangihe Islands District

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Abstract– The aim of our study was to Identify the characteristics of elderly participants with diabetic foot ulcers and the families who care for them and determine the experiences of elderly participants and families in caring for Diabetic Foot Ulcers (DFU) in the Sangihe Regency. Research results show the experience of elderly patients and families in caring for DFU in Sangihe Islands Regency emerged 7 (seven) main themes, namely; 1) Elderly knowledge about Diabetic Foot Ulcer Disease; 2) Family involvement and support in caring for DFU; 3) Diet; 4) Exercise; 5) Medical Treatment; 6) Independent Blood Sugar Monitoring; 7) Foot Care. This research can provide benefits and can add insight for elderly patients to overcome possible obstacles and carry out medical treatment quickly.

Key words: experiences, characteristics, elderly, family, diabetic foot ulcers.

I. INTRODUCTION

Skin breakdown in diabetic patients is a major public health problem (Edmond, 2016). Diabetic foot ulcer (DFU) is a common and very unhealthy consequence of long-term poorly managed diabetes (Dermott, 2023). Approximately 400 million people worldwide will be affected by Diabetes mellitus. The International Diabetes Federation (IDF) estimates that there were 463 million people living with diabetes in 2019 globally and there will be more than 700 million people living with diabetes by 2045. The IDF further projects that the prevalence of Diabetes Mellitus will double rapidly with a more pronounced increase in the Western Pacific, Southeast Asia, Mediterranean and North Africa, which are the fastest growing regions (IDF, 2019 in Jutton et al, 2022). More than 550 million people worldwide and 37 million people in the United States suffer from Diabetes, 18.6 million people in the world, suffer from diabetic foot ulcers every year. Up to approximately 34% of people with type 1 and 2 diabetes suffer from foot ulcers during their lifetime (Armstrong etal, 2023). Of the estimated 537 million people worldwide with diabetes, 19% to 34% will develop a DFU in their lifetime. Approximately 20% of people who develop a DFU will require lower limb amputation either minor (below the ankle), major (above the ankle), or both, and 10% will die within 1 year of their first DFU diagnosis (Dermott et al, 2023). As population, age, and obesity rates increase, the number of people with diabetic foot ulcers will soon increase substantially (Edmond, 2016). A recent large population study found that 9.3% of the population aged 66-74 had diagnosed diabetes, and a further 8.4% had undiagnosed diabetes. One of the major clinical complications of diabetes is foot ulceration (Wiliam et al, 2003). Diabetic foot ulcers are often difficult to heal and can lead to infection, tremendous tissue damage, amputation and disability. The direct economic cost of diabetic foot ulcers was estimated at £252 million in 2001 and is now estimated to be in the region of £300 million per year (Edmonds, 2016). When these wounds become clinically infected, they cause a significant amount of morbidity. According to world statistics, a person with diabetes has a lower limb amputated on average every 20 seconds. At least two typical signs or symptoms of inflammation (pain or soreness, warmth, redness, and

swelling) or purulent discharge appear in diabetic foot ulcers, infection has occurred (suppuration). Patients with diabetes now spend more time in hospital due to foot problems than any other complication of diabetes. In patients with diabetes, diabetic foot infections, especially those that extend to the bone, are the leading cause of lower limb amputation, resulting in an increased risk of death and a higher cost burden. To avoid these adverse outcomes, it is important to prevent foot infections or treat untreated wounds (Baig, 2022).

The treatment of DFUs should follow a multidisciplinary approach that utilizes a variety of diagnosis-tic tools, performed by various specialists, and requires years of experience in treating the condition. Patients must be educated to prevent amputation, and new categories must be used to guide treatment.

Data from the Regional General Hospital of the Sangihe Islands Regency recorded that 77 patients had to pass through the Emergency Unit for hospitalization in the hospital because they suffered from Diabetes Mellitus with complications. Data at the Manganitu Community Health Center of the Sangihe Islands Regency in 2022 showed that there were 20 cases of diabetic ulcers and the cases of patients who came to the Health Center were diabetic ulcers of degree III-IV reaching 50%. The prevalence of diabetic ulcers in Indonesia is around 15% amputation rate 30% mortality rate 32% and diabetic ulcers are the most common cause of hospitalization at 80% for Diabetes Mellitus. Patients with diabetic ulcers in Indonesia require high costs of 1.3 million to 1.6 million per month and 43.5 million per year for a patient. The lack of public knowledge to recognize diabetic ulcers is the cause of high DFU. Research on community understanding has been conducted by researchers on the understanding and behavior of Diabetes Mellitus prevention among the Kawaluso Island Community of Sangihe Islands Regency. The results showed that the understanding and behavior of the people on Kawaluso Island regarding the prevention of DM were in the less category or 79.17% (Tinungki, 2023). If there is a wound or gangrene on the foot, the community and family in the Sangihe Islands Regency tend to assume that there are supernatural or magical things that cause the ulcer. Diabetic foot ulcers experienced by patients are believed to be Because of the witchcraft sent by people who are unhappy with the patient and family, there are efforts made by the patient and family such as taking traditional medicine to ward off the witchcraft and to heal diabetic ulcers, self-treatment of wounds at home by applying turmeric, wasp oil, lemon oil, tawaan oil, bethadine and washing them with warm water or bay leaf, ginger and guava decoction. After the treatment efforts made at home did not give results, then the community went to a health care facility. Due to the duration of the inflammatory process that occurs due to home care, this untreated diabetic ulcer causes the severity of the wound to reach grade IV ulcers or gangrene of the entire foot and part of the leg so that when the patient is referred to the hospital, the patient is sentenced to amputation. As a result of this amputation, there was a prolonged infection process, a decrease in the patient's self-image due to the loss of limbs, causing the patient to lose the spirit to heal until finally the patient died. There have been several cases of death reported after patients received amputation.

The Sangihe Islands Regency Regional Hospital and 17 Puskesmas in the Sangihe Islands Regency, have not provided a foot polyclinic for patients suffering from DFU so that wound care is carried out in the Surgical Polyclinic and the Inpatient Room if the patient is admitted to the hospital. The results of interviews in the preliminary study with DFU patients that during diabetic wound care in hospitals and health centers, how to care for the patient's wounds only by washing the wound using NaCl liquid and immediately covering it with sterile qaas, causing patients to complain that they are not satisfied with the wound care provided by officers at hospitals and health centers because these actions cause diabetic ulcers to not heal. Given these problems, researchers are interested in conducting in-depth exploration of patients and families in caring for diabetic ulcers.

II. MATERIALS AND METHODS

A. Research Method

This research method was conducted using a qualitative method with a phenomenological approach with the research site being the Sangihe Islands Regency. The reason for choosing the location is based on data and after direct observation at the research site, the researcher found the problem under study, namely patients who have foot ulcer problems due to Diabetes Mellitus who have their own experiences in treating diabetic foot ulcers. Qualitative research method is a research method based on the philosophy of postpositivism or interpretative, used to research on natural object conditions, where the researcher is the key instrument.

B. The sampling technique

The sampling technique in this study is a sampling technique that uses Nonprobability sampling technique. Non Probability sampling is a sampling technique that does not provide equal opportunities / opportunities for each element (member) of the population to be selected as a sample member. The sampling technique in this study was that the researcher selected samples based on the inclusion criteria. In this study, the key instrument is the researcher, while the main participants are elderly patients suffering from diabetic foot ulcers and supporting participants are the closest relatives who care for elderly patients with diabetic foot ulcers. The research sample required 14 participants and 14 families with inclusion and exclusion criteria. Inclusion criteria namely Elderly patients ≥ 60 years old, Patients diagnosed with diabetes mellitus with recurrent DFUs, Next of kin directly involved in the patient's wound care at home, Consent to participate in the study. Exclusion criteria namely Patients who do not have recurrent DFUs, Uncontrolled medical conditions such as heart failure, renal failure, stroke. Patients and families refused to participate in the study.

C. The sampling technique

A research variable is anything that is determined by the researcher to be examined to collect information about it and then make conclusions at a practical level, the term -variable‖ is used to refer to a concept or object being studied (Dawis, et, al. 2023) The variable in this study is the experience of elderly patients and families in caring for diabetic foot ulcers in the Sangihe Islands Regency.

D. Research instrument

A research instrument is a tool used to measure observed natural and social phenomena (Sugiyono, 2016). Meanwhile, according to Purwanto (2018), research instruments are basically tools used for collecting data in research. In this study, researchers developed research instruments into 7 major themes. The major themes used in this study are theme 1 about the knowledge of the elderly about diabetic ulcers, theme 2 is family involvement and support in caring for diabetic ulcers, theme 3 is dietary arrangements, theme 4 is exercise, theme 5 is medical treatment, theme 6 is independent blood sugar monitoring and theme 7 is foot care. The researcher is the main instrument equipped with research aids, such as a voice recorder, a list of interview questions, and field notes.

E. Data collection technique

Data collection in this qualitative research was carried out using Observation techniques, Indepth interviews or in-depth interviews. The observation technique in this study is to explore aspects of the problem in participants and understand the behavior in the physical context shown by participants during the indept interview process. While the indept interview technique is a technique for collecting data by conducting conversations or interviews with participants.

Observation technique is to explore unknown aspects of the problem and understand behavior in a physical and social context. In this study, what was observed were key informants, namely 14 people suffering from diabetic foot ulcers and 14 supporting informants. Observations were made using an observation sheet taking notes when making observations about conditions, process situations during indept interviews and participant behavior.

Indepth Interview or in-depth interview is a way of collecting data by conducting conversations and recording with a tape recorder or recording device. In this study, the key informants in this Indepth interview technique amounted to 14 participants with diabetic foot ulcers according to the inclusion criteria and 14 supporting participants or families who cared for people with diabetic foot ulcers. Indept interviews are divided into 7 (seven) major themes consisting of 1 (one) theme about the knowledge of the elderly about diabetic foot ulcers, totaling 5 questions, namely What is the meaning of diabetic foot ulcers for you, what do you think is the cause of diabetic foot ulcers, What is the process of diabetic foot ulcers? How do you feel when you know that your diabetic foot ulcer will require a long treatment? How do you and your family take care of diabetic foot ulcers? Furthermore, 1 (one) theme about family involvement and support in caring for diabetic foot ulcers, consists of 3 (three) questions, namely; What is the family's response when they find out that you have a diabetic foot ulcer?, How does the family provide support for

you?, Does the family always convince you to heal and provide support for the process of treatment and care of diabetic foot ulcers?. And 5 (five) themes about 5 (five) main pillars of Diebetes Mellitus, among others; 3) Diet consists of 4 questions namely; What do you usually eat every day?, Do you know about your dietary needs?, How do you manage your diet?, How do you avoid foods that are high in carbohydrates?. 4) Exercise, consists of 3 questions namely; Do you often What type of physical activity do you do? How long a week do you do physical activity? 5) Medical treatment, consisting of 3 questions namely; Do you regularly take diabetes medication and diabetic ulcer medication?, What type of diabetes and diabetic ulcer medication do you take?, What dose of diabetes medication and DFU medication do you take?. 6) Self-monitoring of blood sugar, consisting of 4 questions namely; What is your normal blood sugar?, How often do you monitor your blood sugar?, Where do you check your blood sugar?, What is your blood sugar in the last 6 months?. 7) Foot care consists of 4 questions namely; how do you wash Diabetic Foot Ulcer wounds?, how do you remove dead tissue?, how do you treat DFU? How do you prevent the wound from recurring? The total number of questions for these 7 major themes was 26.

F. Data analysis method

In this qualitative research, the steps of data analysis include 5 (five) steps, namely: Data collection activities, presentation of raw data, data reduction, data categorization, and constructing categorization relationships.

Data collection was carried out by observation and in-depth interviews, and documentation studies. In this study, researchers collected data on the experiences of elderly patients and families in caring for diabetic foot ulcers in the Sangihe Islands Regency from March to October 2024. The data collected in the field is observed data, namely through in-depth interviews using an interview guide that has been developed.

In-depth interviews using an interview guide that has been developed by researchers to explore the experiences of patients and families in caring for diabetic foot ulcers so that they are in the form of narratives and observable data such as body language (nonverbal)

All the raw data that has been collected is then collected and described or displayed. This data is still scattered without form, without meaning and meaning. Data is packaged in the form of narration / writing. Transcripts contain descriptive information about the data obtained, written according to what the interviewee said. Data reduction by making codes and categories data reduction is a form of analysis that sharpens, classifies, directs, discards, unnecessary and organizes data in such a way. The way that can be taken is to make symbols and have meaning based on topics, sentences or paragraphs from each transcript. Elderly patients are given a symbol (P), families are given a symbol (K). Analyze the components of the research results with a content analysis approach, namely comparing the results of research with existing theories in the literature.

Data reduction is needed to reduce data. Reduction is done to select data that is considered important, is data that has never been known, data that is unique to other data and is data that is relevant to the research question. Data reduction in this study is the creation of codes or symbols and has meaning based on topics, sentences or paragraphs from each transcript. Elderly participants are given a symbol (P), Family is given a symbol (K) and Neighbors are given a symbol (T).

After categorizing the data, the researcher will construct the categorization relationship. Categorization in this study will produce research themes, which may produce different constructions or themes.

G. Data analysis technique

Data analysis technique is a process of processing data into new information. This process is carried out so that the characteristics of the data become more understandable and useful as a solution to a problem, especially those related to research (Ulfah et al, 2022). Data analysis in this qualitative research is descriptive analysis, and thematic analysis, namely constructing relationships between categories.

Analysis is done by selecting data that is important, new, unique and related to the formulation of problems or research questions. The analysis is based on the entire data collected, through various data collection techniques, namely observation and in-depth interviews, documentation and triangulation. Triangulation in this research is source triangulation, technique triangulation and

time triangulation. Triangulation sources in this study are elderly patients and families. Triangulation techniques obtained through interviews, then checked with observation, documentation or questionnaires. Triangulation of time, namely research data conducted interviews in the morning when participants are still fresh, not many problems, so that they can provide more valid data so that it is more credible.

In this study, researchers used thematic analysis, which is the process of processing qualitative data to find out the form of patterns or thematics that exist in the data. Miles and Huberman (1992) describe the process of analyzing qualitative research data as follows (Sugiyono, 2016). There are 7 (seven) major themes in this study, namely 1) Elderly knowledge about Diabeticum ulcer disease, 2) Family involvement and support in caring for Diabetic Foot Ulcer (DFU), 3) Diet, 4) Exercise, 5) Medical Treatment, 6) Independent Blood Sugar Monitoring, 7) Foot Care.

H. Validity and Reliability

The data validity test in this study uses validity and reliability tests. In this study, the data can be declared valid because there is no difference between what the researcher reports and what actually happens to the elderly and families caring for diabetic foot ulcers and families who care for diabetic foot ulcers. In qualitative research, a reality is compound or multiple, dynamic / always changing, so there is no single reality/ always changing, so that nothing is consistent and repeats as before. In this study, the researcher gave a report according to the language and thoughts of the participants. In collecting data, and recording the results of observations and interviews there are individualistic elements.

I. Research ethics

Nursing research ethics is very important because nursing research is directly related to humans in conducting this research, the researcher submits an application for ethical testing to the litbang.stikmuhptk.ac.id section by attaching the application form and thesis. This research was carried out after the researcher obtained a certificate of passing the ethical review from the Research Ethics Committee of the West Kalimantan Muhammadiyah Institute of Technology and Health. The researcher received an Ethical Clearance Decision Letter from the Ethics Committee Board of the Research Center, Community Service and Innovation of the West Kalimantan Institute of Technology and Health Muhammadiyah with Number 228/ILLAU/KET.ETIK/VI/2024.

III. RESULT AND DISCUSSION

A. Participant Characteristics

TABLE 1. PARTICIPANT CHARACTERISTICS

Participants	Age	Gender	Address	Education	Work
Participant 1 (P1)	60 years old	Female	Kauhis, Manganitu District	Elementary School	Taking care of household
Participant 2 (P2)	60 years old	Female	Kauhis, Manganitu District	Did not Finish elementary school	Taking care of household
Participant 3 (P3)	60 years old	Male	Nagha I, Tamako District	Elementary School	Farmer
Participant 4 (P4)	60 years old	Female	Binala, Tamako District	Elementary School	Taking care of household
Participant 5 (P5)	64 years old	Male	Pokole, Tamako District	Sport Teacher School	Pensionary
Participant 6 (P6)	74 years old	Female	Tidore, East Tahuna, District	Elementary School	Taking care of household
Participant 7 (P7)	77 years old	Female	Kolongan, West tahuna, District	Junior High School	Taking care of household
Participant 8 (P8)	72 years old	Male	Malamenggu, South Tabukan District	Junior High School	Farmer
Participant 9 (P9)	64 years old	Male	Lesabe, South Tabukan District	Senior High School	Farmer

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ISSN: 2509-0119.

https://ijpsat.org/
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Participants	Age	Gender	Address	Education	Work
Participant 10 (P10)	62 years old	Female	Malamenggu, South Tabukan District	Elementary School	Taking care of household
Participant 11 (P11)	65 years old	Female	Karatung I, Manganitu District	Elementary School	Taking care of household
Participant 12 (P12)	65 years old	Female	Belengang, Manganitu Disrict	Elementary School	Taking care of household
Participant 13 (P13)	60 years old	Female	Manumpitaeng, Manganitu District	Senior High School	Taking care of household
Participant 14 (P14)	77 years old	Male	Lebo, Manganitu District	Elementary School	Farmer

Table 1. shows that the age of the participants is in the elderly age range of 60 to 77 years, the oldest participant (P7) is 77 years old. Most of the participants were female, most of the participants came from Manganitu sub-district and had different levels of education. Most participants have an elementary school education background and most of them work as housekeepers.

Research results in Table 1. show that the age of participants is in the elderly age range of 60-77 years, the oldest informant (P7) is 77 years old. Research by Detty et al 2020 on the characteristics of diabetic ulcers in patients with Diabetes Mellitus showed that 119 patients, obtained the most age groups in diabetes mellitus were patients with diabetic ulcer complications in the late elderly aged 56-65 years as many as 55 patients with 46.2%. Age turns out to be one of the factors that is independent in influencing changes in the body's tolerance to glucose. Due to aging and functional decline of the body, one of the hormones will experience a decrease in production and hormone expenditure is regulated by the hormone insulin. This is one of the factors that cause diabetes mellitus in the elderly.

Most of the informants were female. The incidence of Diabetes Mellitus increases in women because in women there are differences in body composition and sexual hormones compared to men. In women, adipose tissue is more abundant with fat levels of 20-25% of body weight, while fat in men is only 15-20% (Tinungki et al, 2023).

Most of the informants came from Manganitu sub-district. This is in accordance with the Data on Diabetes Mellitus Patients in Manganitu District in 2023 that Diabetes Mellitus cases amounted to 274 cases. This DM case is the second most common Non-Communicable Disease (NCD) after Hypertension with a total of 1807 cases (Manganitu Health Center Data, 2023). Participants and have different levels of education. Most informants have an elementary school education background. Elementary education is the lowest level of education in Indonesia so that participants' knowledge about Diabetes Mellitus disease will be reduced. Lack of knowledge is caused by a lack of information and a lack of attitude to respond to information (Sibagariang et al, 2024).

Most of the participants work taking care of the household. This is in accordance with the research of Eltrikanawati et al (2020) that most respondents work as housewives. Housewives do not do much work so that with less activity, these housewives experience more high blood sugar levels because housewives do not control a balanced diet while at home.

B. Characterics of Families Caring for ulcers

TABLE 2. CHARACTERISTICS OF FAMILIES CARING FOR ULCERS

Families (K)/Neighbors (T)	Relationship with Patient	Age	Gender	Education	Work
Mr. P. T (K1)	Husband	60 years old	Male	Elementary School	Farmer
Child M.L (K2)	Biological Children	25 years old	Male	Elementary School	Farmer
Child F. M (K3)	Biological Children	25 years old	Male	College	Pastor
Mr.. M. M (K4)	Husband	63 years old	Male	Elementary School	Farmer

International Journal of Progressive Sciences and Technologies (IJPSAT)
ISSN: 2509-0119.

https://ijpsat.org/
Vol. 51 No. 2 July 2025, pp. 46-73

Families (K)/Neighbors (T)	Relationship with Patient	Age	Gender	Education	Work
Mrs. A.M (K5)	Wife	63 years old	Female	Elementary School	Taking care of household
Child N. D (K6)	Biological Children	45 years old	Female	Senior High School	Taking care of household
Mrs. A.L (K7)	Biological Children	47 years old	Female	Junior High School	Taking care of household
Mr. A.M (K8)	Biological Children	28 years old	Male	Junior High School	Farmer
Mr. S.M (K9)	Biological Children	39 years old	Male	Elementary School	Farmer
Mrs. C.T (K10)	Son in Law	37 years old	Female	Junior High School	Taking care of household
Mrs. F.M (K11)	Biological Children	45 years old	Female	Senior High School	Taking care of household
Mr. M. S (K12)	Husband	70 years old	Male	Elementary School	Farmer
Child D. G (K13)	Biological Children	25 years old	Female	Senior High School	Student
Mrs. R. M (K14)	Biological Children	28 years old	Female	Senior High School	Honorary

Table 2. shows that most of the families caring for elderly patients with diabetic foot ulcers are the patient's children, namely K2, K3, K6, K7, K8, K9, K13 and K14 with an age range of 25-47 years.

Research results in Table 2. above, in accordance with Harmoko's 2012 statement about the family that the family is a group that can cause, prevent, ignore or correct health problems in its own group. Health problems in the family related to illness suffered by one of the family members will be able to affect the family, because the family plays a role in the health of the family because the family plays a role in making decisions for health care. One of the roles and functions of the family in systems theory is as a caregiver for sick family members (Smith, Greenberg & Seltzer, 2007).

C. Participants Health History

TABLE 3. PARTICIPANTS HEALTH HISTORY

Participants	Long time suffering Diabetes Mellitus	Duration of DM Treatment	Long time suffering from Diabetic Foot Ulcer (DFU)
Participant 1 (P1)	5 (five) year	5 (five) year	2 (Two) year
Participant 2 (P2)	10 (Ten) year	6 (six) year	6 (six) year
Participant 3 (P3)	5 (Five) months	5 (five) months	3 (Three) months
Participant 4 (P4)	3 (three) year	1 (one) months	1 (one) months
Participant 5 (P5)	14 (fourteen) year	14 (fourteen) year	6 (six) months
Participant 6 (P6)	34 (Thirty Four) year	30 (thirty) year	4 (Four) months
Participant 7 (P7)	5 (five) year	5 (five) year	8 (eight) months
Participant 8 (P8)	19 (Nineteen) year	19 (Nineteen) year	4 (Four) months
Participant 9 (P9)	3 (three) year	3 (three) year	1 (one) months
Participant 10 (P10)	9 (Nine) year	9 (Nine) year	5 (Five) months
Participant 11 (P11)	19 (Nineteen) year	19 (Nineteen) year	7 (Seven) months
Participant 12 (P12)	19 (Nineteen) year	9 (Nine) year	9 (Nine) months

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ISSN: 2509-0119.

https://ijpsat.org/
Vol. 51 No. 2 July 2025, pp. 46-73

Participants	Long time suffering Diabetes Mellitus	Duration of DM Treatment	Long time suffering from Diabetic Foot Ulcer (DFU)
Participant 13 (P13)	20 (Twenty) year	20 (Twenty) year	8 (eight) months
Participant 14 (P14)	4 (Four) year	4 (Four) year	10 (Ten) months

Table 3. shows that most participants who suffer from DM are ≥5 years old (P1, P2, P5, P6, P7, P8, P10, P11, P12, P13). And most participants who suffered from Diabetic Foot Ulcer (DFU) were more than 3 months (P1, P2, P3, P5, P6, P7, P8, P10, P11, P12, P13, P14). While P14 has DM 4years but has suffered from DFU for 10 months.

The results of the study in Table 3. are in accordance with the statement of the Indonesian Ministry of Health, 2019 that Diabetes Complications develop gradually. When too much sugar stays in the bloodstream for a long time, it can affect the blood vessels, nerves, eyes, kidneys and cardiovascular system. Complications include heart attack, stroke and severe foot infections leading to gangrene which can lead to amputation. After 10-15 years from the time of diagnosis, the prevalence of all diabetic complications will increase sharply. Complications that commonly occur in people with diabetes mellitus are chronic and difficult to manage because they have occurred for a long time and large amounts of medical expenses are needed to normalize insulin activity (Phitri et al, 2013).

D. Theme 1 Elderly knowledge about Diabetic Ulcer disease

1) The meaning of diabetic ulcer for participants

Most participants understood that the meaning of diabetic ulcers is the presence of very painful wounds, as can be seen in the following quote:

“A very painful wound” (P1). “Wound (P2)". “Pain (P4)". “The wound hurts a lot (P6)

A participant understood that the meaning of diabetic ulcer is foot damage, as can be seen in the following quote:

“Damaged feet (P5)”.

However, there were some participants who interpreted diabetic ulcers as a result of high blood sugar levels as stated in the following quote:

“Wound caused by high sugar (P9)“.“Sugar Wound (P10)”.“Because of high sugar (P13)".

There were also some participants who interpreted diabetic ulcers as being caused by dark/mystical/magical powers or by things beyond reason, as can be seen in the following excerpts:

“The wound was caused by dark powers (P3).

“Because there are dark powers (P12).

“Because there are people who are unhappy, there are magical powers (P14).

Meanwhile, the meaning of diabetic foot ulcers for some participants is that they are unaware of diabetic ulcers. This can be seen in the following quotes:

“I don’t know (P7, P8, P11)”.

For most participants, diabetic foot ulcers are extremely painful wounds that cause damage to the feet. Some participants believe that diabetic ulcers are caused by high blood sugar levels. For some participants, diabetic ulcers are caused by dark forces/mysticism/black magic. This study aligns with Jannah's 2017 research, which found that knowledge about health and illness among the residents of Sidodadi Village is influenced by mental and spiritual health. Mental health is attributed to the

stability of the body's immune system (naturalistic), while spiritual well-being is associated with the consequences.black magic or witchcraft, as well as the causes and effects of spiritual disturbances that subsequently cause illness (personalistic).

2) Participants' opinions about the causes of diabetic ulcers

Most participants perceived the cause of diabetic ulcers to be high blood sugar levels, as expressed in the following quotes:

“High sugar levels" (P2)”.“When sugar is high, it becomes large (P6).”. “Due to sugar being too high‖ (P7)‖.

“Because of high blood sugar levels (P9).. “High sugar … (P10, P13, P14).”

Meanwhile, some participants said that the cause of diabetic ulcers was infection, as in the following excerpts:

“Infection” (P10). “High sugar levels cause infection (P13).” “The cause is from the garden, dirt, not washing my feet, so small wounds appear... then I scratch them... (P3).”. “In my opinion, the wound occurred because it was pierced by a walnut shell (P4)”.

Some participants stated that the cause of diabetic ulcers is due to pus-filled boils, as cited in the following excerpts:

“It started as a small boil, itchy, then I scratched it and it grew larger (P5)”.

“Suddenly a boil formed and became pus-filled, then the boil opened‖ (P11).

“…a small wound appeared, so I scratched it. That night, it became sharply painful, then itchy, so I rubbed it on the floor, and small boils appeared between the middle and ring fingers of my right foot. Then I popped the boils (P3).

One participant said that the cause of diabetic ulcers was food allergies. The participant's answer can be seen in the following quote: “Because of allergies, I eat foods that I shouldn't eat (P8).”

Some participants said that the cause of diabetic ulcers was dark forces, black magic, and things beyond reason, as can be seen in the following quote:

“It's not a normal wound. “Talibagu,” there is black magic from other people (P1).

“The cause is because people made it (P12).

“.. dark forces (P14).

The study findings reported that most participants stated the cause of diabetic ulcers was due to elevated blood sugar levels, while a small number of participants stated that diabetic ulcers were caused by dark forces. This statement by most participants aligns with Frykberg (2002), who stated that neuropathy is caused by prolonged elevated blood sugar levels, leading to vascular and metabolic abnormalities. Increased intracellular sorbitol levels cause nerve swelling andimpaired function. Diabetic ulcers are caused by several factors, including neuropathy, trauma, foot deformities, high pressure on the soles of the feet, and peripheral vascular disease. The causes of peripheral neuropathy in diabetes are multifactorial and are thought to result from vascular disease affecting the vasa nervorum, endothelial dysfunction, myoinositol deficiency, changes in myelin synthesis, decreased Na-K ATPase activity, chronic hyperosmolarity, causing edema in the nerves, and the effects of increased sorbitol and fructose.

3) The process of diabetic ulcer formation

Some participants stated that the process of diabetic ulcer formation was due to small wounds that grew larger, as seen in the following excerpts:

—At first, I didn't pay attention to it because I thought it was normal to have small wounds between my toes (P3).

“The wound on my right toe occurred after being pricked by a walnut shell, then I developed a fever… (P4).”

“From a small wound to a large one (P7).”

“A small wound that eventually grew larger (P8).”

“A small wound that eventually became large (P9).”

“Redness occurred, then a wound formed and became weeping (P10).”

However, some participants perceived the process of developing a diabetic ulcer as a blistering and pus-filled sore, as seen in the following quote:

—The wound on my left foot suddenly blistered, then became large (P1).“ ”At first, there was a boil on my breast and foot, then the boil quickly grew larger and became infected (P2)."

"This wound on my foot first appeared in 2021, with a boil and itching, then I scratched it until it grew larger. Then I left it alone, and after four months it turned black. I went to the health center, and they referred me to Liunkendage Tahuna Hospital (P5).”

Some participants perceived that the development of diabetic ulcers was due to itching of the skin, which led to scratching, as seen in the following quote:

“At first, I had a food allergy, so it felt itchy, and I scratched it. When my blood sugar was high, it became this big and very painful (P6).”

“First, it was itchy on my right calf, and because I scratched it, it became a wound (P12).”

“It started with a wound between the toes of my right foot, it itched, so I scratched it, and it grew larger until I was taken to the hospital and had to undergo amputation (P13).”

A small number of participants were unaware of the process of diabetic ulcer formation, as can be seen in the following excerpts:

“I didn't know, I suddenly found out because my dog often came close to my feet and sniffed them, and I saw that there was a wound on my big toe (P11).”

“I didn't know, suddenly there was a wound. The wound gradually grew larger and became like this (P14).” The process of diabetic ulcer formation in most participants involved small wounds that gradually grew larger. Some participants stated that the process of diabetic ulcer formation involved blisters that burst, while others stated that it involved itching. The skin serves as the interface between the external and internal environments of the body and is structurally composed of three layers: the epidermis, dermis, and hypodermis. The skin plays a crucial role in protecting the body. Humans are exposed to harmful agents such as toxic substances, ultraviolet radiation, mechanical and physical damage, and pathogenic microorganisms. Thus, changes in skin integrity caused by trauma are called wounds. Wounds or lesions are generally caused by external factors such as surgery, mechanical impact, heat, cold, chemicals, and biological factors including impaired blood supply, diabetes, and leishmaniasis. These factors hinder the healing process, cause dangerous infections in the tissue, and delay tissue recovery, increasing costs, treatment duration, and the risk of complications (Sari et al, 2023).

4) Participants' feelings upon learning that the diabetic foot ulcers they were experiencing would require long-term treatment.

Most participants felt worried upon learning that the diabetic foot ulcers they were experiencing would require long-term treatment. This can be seen in the following excerpt:

“Worried about not being able to work and go to the garden. If there’s a wound, I apply turmeric. There’s also a leaf given by someone, but I don’t know where it comes from (P1).”

“Worried and in pain (P5).” “Worried and afraid (P11).”

“Worried that the wound won’t heal (P12).” “Worried because the wound is getting bigger (P14).”

Some participants expressed feelings of resignation and acceptance, as seen in the following quotes:

“I am resigned and hope to recover quickly, because I have to take care of my 86-year-old mother and my son (P2).”

“I am resigned and leave it in the hands of the doctor. I have faith and am optimistic about recovery (P3).”

"I am sincere and pray to God for a quick recovery (P6)."

Some participants expressed feelings of pain, as seen in the following excerpts:

"Feelings of pain (P4).. "...and pain (P5)."

However, some participants expressed feelings of sadness, as seen in the following excerpts:

"Sad (P7).". "Sad ... (P8).". "Sad (P9).". "Sad ... because the wound is getting bigger (P10)." "Sad ... (P13)."

There were also some participants who expressed feelings of fear, as seen in the following quotes:

"…afraid (P8)". "…afraid because the wound is getting bigger (P10)‖. "…afraid (P13)". "…afraid (P11)".

The informants' feelings upon learning about the diabetic foot ulcers they were experiencing requires long-term care

The results of the study on the feelings of participants when they learned that the diabetic foot ulcers they were experiencing would require long-term care were worry, resignation and acceptance, pain, sadness, and fear. These findings align with the research by Alfaqih et al. (2020), which, based on 15 reviewed articles, revealed that the majority of patients with diabetes mellitus (DM) and diabetic ulcer complications experience stress, depression, and anxiety. They also face financial burdens, feel powerless, blame themselves, and experience uncertainty about life. They require broader support from family and society. The results of this study are also in line with the research by Croker et al, 2021, which found that based on 15 patients treating diabetic foot problems, the main themes that emerged around the impact included the heavy burden of managing care, significant loss of outpatient function, economic pressure due to medical care costs and job loss, and emotional distress related to these stressors.

5) How participants and their families care for diabetic foot ulcers.

Most participants and their families care for diabetic foot ulcers by washing the wounds with NaCl infusion fluid, as seen in the following excerpts:

"Every day I clean my wife's wounds with infusion water and sterile gauze... Every day (K1)."

"After the doctor's medication, I also put a type of wood called tetule in the infusion solution. That is for washing the wound and drying it… (P2)."

"For my husband's wounds, I clean them with saline solution... This medicine was taught to me by a friend who has a child at Pancaran Kasih Hospital in Manado (P4)."

—I am the one who usually takes care of my grandmother's wounds. So, before I go to the garden in the morning, I take care of my wife's wounds. I treat them every day with saline solution... Every day (K4).

"To clean the wound, I bought infusion fluid at the pharmacy in the market… (K5).

"I treat it using infusion fluid… (P6)."

"Cleaning the wound with infusion fluid, alcohol, and Betadine (P7)."

"Washing the wound with infusion fluid (P11)."

"I'm afraid to see the wound, but for my mother's sake, I muster the courage because who else will clean it at home besides me? It's just the two of us in this house. I clean it with infusion fluid and then cover it with gauze (K11)."

"Washing the wound with infusion fluid… on the wound (P12)."

"I helped clean my wife's wound using infusion fluid…that's what the auxiliary health center nurse here said (K12)."

"Cleaning with NaCl… (P13)."

"Cleaning the wound using NaCl solution… cleaned every day (K13)."

Some participants treated diabetic foot ulcers by washing the wounds with clean water and warm water, as seen in the following excerpts:

“Before the wound care nurse arrived, I tried to clean it using clean water (K8).”

“Washing the wound with clean water (P9).”

“I helped my father clean his diabetic wound by washing it with clean water (K9).”

“Cleaning with warm water… (P14).”

“I cleaned my father’s wound by applying warm water… (K14).”

However, some participants cleaned diabetic foot ulcers using Rivanol, as seen in the following quote:

“Usually before I ask the nurse to treat the wound, I wash it with Rivanol and cover it with gauze (K13).” “Washing the wound with Rivanol until clean and bandaging itP10).

“I clean my mother-in-law's wound with rivanol and then cover it with gauze. I clean it every day (K10).”

One participant washed diabetic foot ulcers using alcohol, as seen in the following excerpt:

“Cleaning wounds with... alcohol and bethadine (P7).”

Most participants and family members treated diabetic foot ulcers using honey, as seen in the following quote:

“I applied honey. Every day (K1).”

“I usually take care of my grandmother’s wound… I take care of it every day… then rub honey on it. Every day” (K4).

“Before the wound care nurse came, I tried… applyinghoney to it (K8).”

“…apply honey (P9).. “I helped my father clean his diabetic foot ulcer by… applying honey (K9).”

“…then apply honey (P13).”. “…apply honey. Clean it every day and apply honey (K13).”

However, some participants and their families treated diabetic foot ulcers using Metronidazole, as in the following quotes:

“… sprinkled with metronidazole. This medication was taught by a friend whose child was at Pancaran Kasih Hospital in Manado (P4).”

“…. Then I sprinkled the metronidazole medication. That’s what the community health center nurse said. So, I treated it daily with metronidazole (K5).”

“... Metronidazole tablets crushed and applied to the wound (P12).”

“I helped clean my wife’s wound…applied with metronidazole medication, as the auxiliary health center nurse here said (K12).”

There were also participants and families who treated diabetic foot ulcers by using Amoxicillin medication, as in the following excerpts:

“... sprinkled with Amoxicillin (P14).”

“... then I dried it and sprinkled it with Amoxicillin medication (K14).” Some participants and their families treated diabetic foot ulcers using wound ointment from a wound care nurse and wound care by a certified nurse, as in the following quote: P3: “...For the wound after the surgery, I asked my nephew, who has expertise in treating diabetic wounds, to take care of it.”

K3: "After we returned from Manado, I followed the wound nurse's advice to find a diabetic wound nurse in Sangihe Regency.

K6: “Before the diabetic wound care nurse arrived, I helped clean my mother’s wound. I applied the infusion solution and diabetic wound ointment to the wound, but the dead skin had not yet been removed.”

P8: "Cleaned by the wound care nurse here."

However, some participants and their families treated diabetic foot ulcers using traditional medicine, as in the following quote: "I treat it every day with turmeric and leaves, but it doesn't heal… (P1).

"After the doctor's medication, I also added a type of wood called tetule wood to the infusion fluid. That's for cleaning the wound and drying it out. For internal medication, I grind garlic and drink the juice. Sometimes cinnamon is boiled and the water is drunk. For the wound, there's a traditional leaf called 'kapu Buwuhe' mixed with turmeric and applied to the wound (P2)."

The research results show that participants, as patients, primarily used NaCl infusion fluid, traditional medicine, clean water, ointment, crushed Metronidazole powder, Rivanol, crushed Amoxicillin powder, and two individuals Participants were treated directly by certified wound nurses.

The way families care for diabetic foot ulcers is by using infusion water, some use honey, and some also use crushed metronidazole tablets then apply them, other participants use bethadine and alcohol, as well as clean or warm water (K8, K14), use rivanol (K10), and two participants use wound care services (K2, K3).

The method used by participants and families, who mostly use NaCl infusion water, aligns with the findings of Moenadjat's 2006 study, which noted that various wound care methods include foams, honey, hydrogels, alginates, and polyurethane films. For patients, the choice of wound care is adapted to their economic conditions, with practical and affordable options typically being preferred. using physiological antiseptic solution (NaCl or RL). The results of this study are consistent with the research by Ningsih et al., 2019, on honey therapy for diabetic ulcer patients. The study found no significant difference between the use of honey and povidone iodine in the healing of diabetic foot ulcers, leading to the conclusion in Ningsih's study that honey is safe for use in diabetic foot ulcer therapy. Acton et al. 2008 stated that honey contains several mineral components such as sodium, potassium, magnesium, aluminum, phosphorus, iron, and calcium. The most important enzymes found in honey are diastase, invertase, glucose oxidase, peroxidase, and lipase.

E. Theme 2 Family involvement and support in caring for diabetic foot ulcer (DFUs)

1) Family response upon learning that the elderly person has a diabetic foot ulcer.

Several participants said that their families reacted with anxiety and fear upon learning that the participants had diabetic foot ulcers, as in the following quotes:

"Anxious and afraid because the doctor wants to amputate, but I don't want that (P5)."

"Anxious and afraid because I lost my left toe (P6)."

"Anxious and afraid because of the possibility of amputation (P7)."

"The family's response was anxious but supportive (P8)."

One participant mentioned that the family also responded with resignation upon learning that the participant had a diabetic foot ulcer. As in the following excerpt:

"Resigned (P10)".

There were also several participants who said that their families were not very supportive and cared for their diabetic foot ulcers at home, as in the following excerpts:

"My children take care of me (P12)". "My children (P13)".

"My wife is not very supportive, only my daughter takes care of me (P14)".

However, some participants mentioned that their families responded differently, such as providing encouragement/support and motivation to the participants, as in the following quote:

"Family response provides encouragement (P1)." "My family is very supportive. My husband takes care of my wounds every day. My child also takes over my household duties (P4)."

"My family is anxious but supportive (P8)."

"My family encourages me and monitors my eating and drinking (P9)."

"My family supports me by taking good care of me (P11)."

Some participants mentioned that their families responded by immediately taking them to a healthcare facility, as seen in the following quotes:

"My child often takes me to the community health center and hospital (P2).

"When I was sick, my wife and child immediately took me to the hospital. I was immediately handed over to the doctor (P3)."

The family's response upon learning that the informant had diabetic foot ulcers was anxiety and fear, immediately taking them to a healthcare facility, providing encouragement, support, and motivation. (P9), Resignation (10), lack of support (P14), cared for at home (P13). The results of this study are consistent with the research by Kartika et al. 2015 on the experiences of families in caring for chronically ill patients, which found that the first theme, psychological responses of families, was formed from the sub-themes of fear, confusion, sadness, worry, and acceptance. These feelings of shock, fear, sadness, and worry are initial responses when family members begin to show signs of illness. According to Friedman (1981) in Setiawan (2016), families have the duty and function of providing care to family members who are sick or unable to help themselves.

2) How families provide support to participants

Some participants said that family support meant taking good care of wounds, as in the following quotes:

"…as for my child, he diligently cleaned my wounds (P1)."

"My husband… also took care of my wounds (P4)."

"Taking good care of wounds during illness (P5)."

"Taking good care of wounds during illness (P6)." "Taking good care of wounds (P7)."

"Taking good care of wounds during illness (P8)."

Some participants mentioned that family support involves covering the costs of ulcer treatment, as seen in the following quote:

"If my husband earns money for treatment,… (P1) "My child gives me money for treatment (P2)."

"Support in the form of financial assistance and "Support in the form of financial assistance and attention for treatment. They are sensitive (P3)."

"The family provides support by earning money by selling bananas, while the husband takes care of daily needs… (P4)."

There were also participants who said that family support was healthy food and drink, as can be seen in the following quote: "Preparing safe food and drink and providing good care (P9)."

However, some participants said that family support was simply providing encouragement with positive words, as in the following quotes:

"Encouraging and caring well (P10)." "Encouraging and caring for me (P11)."

"Providing support with positive words (P12)." "Encouraging and supporting (P13)."

"Encouraging that I will definitely recover (P14)."

The way families support participants is by raising money for ulcer treatment costs, properly caring for wounds, preparing healthy food and drinks, providing encouragement, and offering positive words. The family is a care service unit aimed at improving the physical, mental, emotional, and social development of each family member. Health issues within a family are interconnected. A disease suffered by one family member can affect the entire family, as the family serves as an effective and accessible intermediary for various community health initiatives. The results of this study are consistent with the experiences of illness reported by Ariyanto et al. (2023), which identified five themes: family support during diabetic ulcer treatment, elderly individuals' knowledge of diabetic ulcers, the psychology of elderly individuals during diabetic ulcer treatment, elderly individuals' coping mechanisms in dealing with diabetic ulcers, and the cost factors that arise during the treatment process for diabetic ulcers. This study is also consistent with the research by Alfaqih et al. (2020), which, based on 15 reviewed articles, found that the majority of patients with diabetes mellitus (DM) and diabetic ulcer complications experience stress, depression, and anxiety. They also have financial burdens, feel helpless, blame themselves, and feel uncertainty about life. They need broader support from their families and communities 3) Families always encourage elderly people to recover and provide support for the treatment and care of diabetic foot ulcers.

Most participants said that their families always encouraged them to recover and provided support for the treatment and care of diabetic foot ulcers. This can be seen in the following quotes:

“Yes. My husband and children always encouraged me to recover (P1).”

“Yes. My child helps and reassures me that I will recover (P2).”

“Yes. My wife and child reassure me that I must stay positive and will definitely recover (P3).”

“Every morning, I am cared for by my husband and family at home, and they reassure me that I will recover (P4).” “Yes. My family always reassured me that I would recover (P5, P6, P7).”

“Yes. My family provided support and reassured me that I would recover (P8).”

“Yes. My family gave me support and reassured me that I would recover (P9).”

“Yes. Always (P10).”

“Yes (P11, P12, P13).”

However, one participant experienced something different due to a lack of support, as quoted below:

“Other family members sometimes gave me encouragement (P14).” All participants stated that their families always encouraged them to recover and provided support for the treatment and care of diabetic foot ulcers.

The results of this study differ from Sondergaard’s 2023 study, which identified the population and context to determine the focus of the review conducted on 13 sources. Results research shows that during the review process, four main themes emerged: “the whole person, not just the hole in the person”; the burden on the family, community, and environment; competence and continuity of care are essential for high-quality care; and “quality and modality of technology.” Further investigation from the perspective of patients and multi-sectoral caregivers is needed, with a focus on any modifications of TM interventions that are more appropriate for the DFU care pathway.

F. Theme 3 Diet

1) Participants' daily food consumption

Most participants said that the food they consumed every day consisted of carbohydrates such as rice, taro, sago, vegetables, and fish, as seen in the following excerpts:

“Rice, cassava, sago, vegetables, fish, but for the past two years I have abstained from eating cakes (P1).”

“Sago, vegetables, fish (P2).”

"Rice, vegetables, fish. My daily habit is to drink coffee twice a day and eat butter cakes. In the morning, I eat tofu, porridge, boiled and scrambled eggs, and fried rice. At noon, I eat taro, vegetables, and fish,… (P3)." "Rice, taro, bananas, vegetables, and fish. No dietary restrictions (P4)."

"Rice, fish, and vegetables (P5)."

"Rice, fish, and vegetables. All types of vegetables and fish (P7)." "Rice, fish, vegetables, and fruit (P8)."

"Red rice, fish, and vegetables (P9)."

"Red rice and foods recommended by health workers (P10)."

"I eat normally. I like to eat sago, fish, vegetables, and moist cakes (P11)."

"I eat taro because it is low in sugar, and I eat fish and vegetables (P12)."

"I eat taro because it is low in sugar, and I eat fish and vegetables (P13)."

However, one participant said that they were allergic to fish and eggs, as quoted below:

"Rice and vegetables, tofu and tempeh every day. I am allergic to seafood. And eggs (P6)."

Some participants also said that they consume brown rice instead of other carbohydrates, as in the following quote: "Brown rice, fish, and vegetables (P9)."

"Brown rice and foods recommended by health workers (P10)."

Some participants also mentioned that they enjoyed snacks, as can be seen in the following quotes:

"...I still eat cakes twice a day and drink Diabetasol milk in the morning and at night (P3)."

"I eat normally, I like to eat sago, fish and vegetables, and eat wet cakes (P14)." Most participants (P1, P2, P3, P4, P5, P7, P11, P12, P13, P14) ate rice, taro, sago, fish, and vegetables. However, P6 was allergic to seafood and eggs, so he ate tempeh and tofu every day. P9 and P10 ate red rice with fish and vegetables, while P3 and P14, in addition to eating rice, fish, and vegetables, also enjoyed eating cakes (snacks). The research findings align with the study by Agustin et al., 2023, which found that nutritional counseling based on principles of regulating food types, calorie intake, and meal schedules can influence dietary compliance in patients with type-2 diabetes mellitus. For diabetes patients, the importance of meal regularity, such as meal schedules, portion sizes, and food types, must be emphasized, especially for Those who use blood glucose-lowering drugs or insulin. The recommended standard is to eat foods that contain a balanced composition, such as 60-70% carbohydrates, 20-25% fat, and 10-15% protein. To determine nutritional status, it is calculated using BMI (Body Mass Index).

2) Participants' knowledge of dietary needs

Some participants were unaware of their dietary needs. This is evident in the following quote:

"I don't know (P1, P2, P3, P4, P11, P12, P14)."

Other participants, however, stated that they were aware of their dietary needs. This is evident in the following quote: "Yes, I know (P5, P6, P7, P8, P9, P10, P13)."

Some participants (P1, P2, P3, P4, P11, P12, P14) were unaware of their dietary needs, while others were aware of their dietary needs (P5, P6, P7, P8, P9, P10, P13).

Participants who were unaware of their dietary needs had different results compared to the study by Massiani et al. (2024), which found a correlation between knowledge levels and adherence to dietary therapy among diabetes mellitus patients. The findings of Massiani et al.'s study align with the opinions of some participants in this study, who stated that they were aware of the dietary requirements for diabetes mellitus.

3) How participants managed their diet

Most participants managed their diet by following the advice of doctors and nurses at the hospital, namely by reducing carbohydrates, as quoted below:

“After finding out about my diabetes and this wound, I usually avoid eating flour, expensive rice, and coffee (P3).”

“Following the advice of the hospital (P5).”

“A nurse came to my home and advised me to reduce flour intake, so I reduced my consumption of foods containing flour (P6).”

“Following hospital recommendations (P7).” “Following doctor’s recommendations (P8).”

“Following Puskesmas and hospital recommendations (P9).” “Following doctor’s recommendations (P10).”

“Following the hospital’s advice (P13)”.

However, some participants did something different. They maintained a normal eating pattern of three meals a day and consumed foods similar to those they ate before developing diabetes, as seen in the following excerpts:

“3 small meals a day (P1).”

“3 meals a day, 1 large spoonful of rice (P2).”

“No restrictions. Eat normally (P12).”

“No restrictions. I just eat three times a day (P14).”

Some participants also maintained a four-meal-a-day eating pattern and consumed foods similar to those they ate before developing diabetes, as seen in the following quotes:

“No restrictions. I just eat four times a day (P4).”

“No restrictions. I eat four times a day (P11).” The results of the study indicate that most participants (P3, P5,P6, P7, P8, P9, P10, P13) managed their diet by following the recommendations of the hospital, doctors, and nurses, namely by reducing carbohydrates. Some participants (P1, P2, P12, and P14) ate three meals a day, similar to a normal diet. P4 and P11 ate four meals a day. This study is consistent with the research by Nurmeiliana et al. (2024), which found a significant association between dietary patterns in patients with type II diabetes mellitus and knowledge ($p = 0.0025 < \alpha = 0.05$), family support ($p = 0.0013 < \alpha = 0.05$), and the role of healthcare providers ($p = 0.007 < \alpha = 0.05$). Poor knowledge among patients with type II diabetes mellitus carries a risk

2.4 times greater than patients with good knowledge. Poor family support in managing dietary patterns for diabetes mellitus patients carries a risk 2.7 times greater than those with good family support. And poor healthcare provider involvement in managing dietary patterns carries a risk 2.9 times greater than those with good healthcare provider involvement. This study is also in line with Rahman et al's 2024 study, which addresses the eating patterns of diabetes mellitus patients in stabilizing blood sugar with four themes, namely meal schedules, including meal times, food quantities consisting of carbohydrates and protein, food types, namely heavy meals and snacks, and family support, namely support or advice.) How participants avoided foods high in carbohydrates Some participants avoided foods high in carbohydrates by reducing their carbohydrate intake and even avoiding carbohydrates altogether, as seen in the following quotes:

“I only eat 2 spoonfuls of rice (P1).” “I only eat 1 large spoonful of rice (P2).”

“After learning about diabetes and this wound, I usually avoid eating flour, expensive rice, and coffee (P3).”

“Reducing portions of flour-based foods and replacing them with safer options like eating plenty of vegetables, fruits, and fish (P5).”

International Journal of Progressive Sciences and Technologies (IJPSAT)
ISSN: 2509-0119.

https://ijpsat.org/
Vol. 51 No. 2 July 2025, pp. 46-73

"Reducing portions of flour-based foods and replacing them with safer options like eating lots of vegetables, fruits, and fish (P6, P7, P9, P13)."

"Eating only 1 large spoonful of rice (P8)."

"Replacing with low-carbohydrate foods (P10)." Other participants expressed different opinions. They did not know how to avoid foods high in carbohydrates. This can be seen in the following quotes:

"Don't know how to avoid carbohydrates (P4)." "Don't know how to avoid (P11)."

"Don't know how to avoid carbohydrates (P12)." "Don't know how to avoid carbohydrates (P14)."

The research results show that the way informants avoid high-carbohydrate foods is by reducing carbohydrates by eating only 1-2 spoonfuls of rice (P1, P2, P3, P5, P7, P8, P9, P13). Meanwhile, participants P4, P11, P12, and P14 did not know how to avoid high-carbohydrate foods.

These findings align with Dwi's 2020 study, which found that diabetes patients' dietary compliance was in the These findings align with Dwi's 2020 study, which found that diabetes patients' dietary compliance was in the "good" category, i.e., 88.9%. Compliance with this diet includes limiting carbohydrates, limiting fatty foods, limiting soft drinks, limiting sweeteners, and frequently consuming fiber-rich foods, vegetables, and fruits.

G. Theme 4 Exercise

1) Frequent physical activity

Some participants frequently engage in physical activity. This can be seen in the following quotes: "Before I got sick, I used to go often. I often went to the garden. But now that I have a wound, I'm afraid to go to the garden, afraid of getting pricked by thorns (P1)."

"Before I got sick, I often played soccer and went to the garden, but now that I'm sick, I can't go anywhere (P3)." "Before I got sick, I often went to the garden, but now I just stay at home (P4)."

"Yes. I often go to church and walk around even though there's still a wound on my foot (P5)."

"Yes, I work at home all day, cooking and managing the house. Now that my foot is like this, I can't walk anymore (P6)." "Yes. I walk to sell bread. So, even though my leg is bandaged, I still continue to engage in activities (P13)."

Some participants reported different experiences. They were unable to engage in physical activity. This is evident in the following quotes:

"I do not engage in walking activities because both legs are weak (P2)."

"I don't engage in activities since the injury (P7)."

"I don't engage in activities (P8, P9, P10, P11, P12, P14)."

The research findings indicate that participants frequently engaged in physical activity before developing diabetic foot ulcers. However, before developing diabetic foot ulcers, Diabetic participants P2, P8, P9, P10, P11, P12, and P14 were unable to perform physical activities due to weakness and age-related factors. When suffering from diabetic foot ulcers, most participants were unable to perform physical activities, while P13 continued to engage in physical activities such as walking to sell their goods. The results of this study align with Arania's 2021 research, which found that the most common level of physical activity was low at 39.7%. In terms of employment, 37.2% of respondents were unemployed.

2) Types of Physical Activity

Some participants engaged in physical activity by walking. This is evident in the following quotes:

"In the past, walking, climbing mountains, gardening… (P1)." "Walking (P5)."

"I walk to sell bread even though I have wounds (P13)." There were also participants who engaged in physical activity through sports, as can be seen in the following excerpt:

"Every day playing soccer ... (P3)."

Some participants also engaged in physical activity through work, as can be seen in the following excerpts:

"Every day ... to the garden (P3)." "Every day to the garden (P4)."

"Inside the house, such as cooking, sweeping, and cleaning the house (P6)."

Some participants expressed a different perspective. They never Engaging in physical activity. This can be seen in the following excerpts:

"Rarely walks due to weak legs (P2)." "No (P7, P8, P9, P10, P11, P12, P14)."

The types of physical activity performed by some participants include walking, going to the garden, playing ball, cooking, sweeping, and cleaning the house. Meanwhile, other participants do not engage in physical activity.

Physical activity is the movement of skeletal muscles to expend energy through daily activities and leisure time (Ministry of Health 2015 in Arania 2021). Lack of physical activity is an independent risk factor for chronic diseases and is estimated to contribute to global mortality. The effects of physical activity, such as exercise, are directly related to the increased rate of muscle glucose recovery. When When performing activities, muscles use glucose stored in the muscles, and when glucose levels decrease, muscles fill the gap by taking glucose from the blood. This causes blood glucose levels to drop, thereby increasing blood glucose control (Barnes 2011).

3) Duration of physical activity

Some participants engage in physical activity every day. This can be seen in the following quotes:

"Every day (P3, P4, P6).". "Every day I sell bread (P13)."

There were also some participants who did physical activities 2-3 times a week.

This can be seen in the following quotes: "2-3 times a week (P1).", "I go out 3 times a week (P5)."

Some participants said something different. They didn't do any physical activities. This can be seen in the following quotes:

"Can't do any activities, mostly just sitting. If I want to cook, I sit down; my mom is the one who often goes to the market (P2)." "Can't do any activities (P7, P8, P9, P10, P11, P12, P14)." The results of the study on the duration of physical activity performed by participants showed that most participants engaged in physical activity daily, with 4 participants doing so. P1 and P5 performed physical activity 2-3 times a week, while 8 participants were unable to engage in physical activity due to chronic illnesses and aging. Fatimah's 2015 study recommended regular exercise (3-4 times a week) for approximately 30 minutes, characterized by Continuous, Rhythmical, Interval, Progressive, and Endurance (CRIPE) principles. The exercise should be tailored to the patient's capabilities, such as light walking for 30 minutes.

H. Theme 5 Medical Treatment

1) Compliance with diabetes medication and diabetic ulcer medication.

Several participants reported that they regularly took diabetes medication and diabetic ulcer medication. This can be seen in the following excerpts:

"Regularly. I follow the doctor's advice (P1)."

International Journal of Progressive Sciences and Technologies (IJPSAT)
ISSN: 2509-0119.

https://ijpsat.org/
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"Yes. I regularly take metformin for diabetes (P2)." "Yes. I regularly take diabetes medication... (P3)." "Yes. I regularly take medication (P5).". "Yes (P7, P9, P10, P13)."

Several other participants expressed different opinions. They did not regularly take diabetes medication and diabetic ulcer medication. This can be seen in the following excerpts:

"No (P4, P8, P12, P14)." . "No. Not regularly (P6, P11)."

Most participants regularly take diabetes medication and diabetic foot ulcer medication, while some participants do not regularly take diabetes medication and diabetic foot ulcer medication. The results of this study differfrom Purwanti's 2023 study, which found that medication adherence is related to the level of knowledge of diabetes mellitus patients. If the level of knowledge about diabetes mellitus increases, medication adherence will also increase. Glycemic control will be better in patients with good knowledge of diabetes and high adherence to antidiabetic drugs (Purwanti et al, 2023).

2) Types of diabetes mellitus and diabetic foot ulcer medications consumed by participants

Several participants reported that the type of diabetes medication they consumed was Metformin. This can be seen in the following excerpts:

"The diabetes medication prescribed by the doctor is Metformin… (P2)." "Metformin… (P3)." . "… sometimes takes Metformin (P6)." "Metformin 3x1 (P7)." . "… Metformin (P10)."

"Metformin 3X 1 tablet (P13)" Some participants also mentioned that the type of diabetes medication they took was Glibenclamide. This can be seen in the following quotes:

"The first diabetes medication I took was Glibenclamide 5 mg in the morning and evening... (P1).

"I take glibenclamide once a day, 10 mg in the morning (P5).

"I sometimes take Gliben... (P6).". "…and Gliben 10 mg (P9)." . "Sometimes Gliben 10 mg every morning (P11)."

Some participants also mentioned that the type of diabetes medication they used was insulin via injection. This can be seen in the following quote: "…there are 10 units of Novomix, 14-16 units when blood sugar rises high. Now it is increased to 18 units in the morning and 18 units at night. Gliben is stopped… (P1).

"…, insulin… (P3)". "Insulin 2 times a day, doses of 8 and 10… (P9)". "Insulin 2 times a day at doses of 8 and 10… (P10)."

Different information was provided by other participants. They did not take diabetes medication. This can be seen in the following quote:

"Some were given by the health center but have run out; I don't know the name of the medication (P4)."

"Do not take medication (P12, P14)." Some participants mentioned that the medication for diabetic foot ulcers they took was Metronidazole tablets, and the medication applied to the ulcers was Metronidazole powder and Metronidazole liquid. This can be seen in the following quote: —For the wound, I took Metronidazole and Paracetamol (P2).

"If the wound is washed with infusion fluid, then use liquid metronidazole (P3)."

"I sprinkled it with Metronidazole (P4)."

"… sprinkled with Metronidazole medicine (P12)."

Some other participants stated that the oral medication for diabetic foot ulcers is Cefadroxyl.

When I have this wound, I take Cefadroxyl 3x1 tablet, vitamins, and pain relievers… (P1). Some other participants reported different experiences. They did not take oral medication, but only applied ointment to the diabetic foot ulcers. This can be seen in the following excerpts:

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"… use metcovazin ointment (P3).". "Cleaned by the wound nurse here (P8)."

The type of diabetes medication consumed by most participants was Metformin. Five participants took Glibenclamide. Four participants used insulin. However, P4, P12, and P14 did not take any medication.

The results of this study differ from those of Karno et al. 2023. In that study, DM patients received a combination of two types of medication: Metformin and Glimepiride. According to medical records, Metformin and Glimepiride are the most commonly consumed antidiabetic medications. Metformin reduces hepatic gluconeogenesis with a low risk of causing hypoglycemia. The same applies to Glimepiride. Glimepiride will stimulate the pancreas, allowing metformin to work effectively, thereby producing a synergistic effect, so that the efficacy of both drugs is optimized

to suppress hyperglycemia (Karno et al, 2023).

The type of diabetic foot ulcer medication used by the participants was Metronidazole, either in tablet form (crushed and applied as a powder) or liquid form (P2, P3). P1 consumed Cefadroxyl capsules 3x 500 mg. Meanwhile, P3 used Metcovazin ointment on the ulcer.

The results of this study align with the research by Murni et al. (2024) that Metronidazole compresses are effective in wound healing. Diabetes. Metronidazole is a drug used to prevent and treat anaerobic infections and mixed anaerobic infections with erotic, trichomoniasis, amoebiasis, giardiasis, and lambiasis (Tanu et al., 1995). Proper and appropriate use of metronidazole and 0.9% NaCl solution accelerates the healing of diabetic foot ulcers (improvement within 3 weeks) compared to using only 0.9% NaCl solution (healing takes 6 weeks). Metronidazole is a second-generation drug, meaning it has limited solubility and good permeability, with its bioavailability controlled by the dosage formula and the release rate of the active ingredient (Shargel et al, 2004). 3) Diabetes medication and DFU medication doses consumed by participants Several participants reported consuming 10–18 units of insulin as their diabetes medication dose. This can be seen in the following excerpts:

"Novomix 10 units, 14–16 units when blood sugar rises high. Now increased to 18 units in the morning and 18 units at night. Gliben stopped…(P1). "Insulin 2 times a day at doses of 8 and 10 units… (P9)".

"Insulin 2 times a day at doses of 8 and 10 units… (P10)". Some participants reported that the diabetes medication dosage they consumed was metformin 1–3 times 500 mg daily. This can be seen in the following quote:

"The diabetes medication prescribed by the doctor is metformin once daily in the morning after meals (P2)."

"Metformin once daily (P3)."

"… sometimes takes metformin (P6)." "Metformin 3x500 mg (P7)."

"… metformin (P10)."

"Metformin 3x 1 tablet (P13)" Some participants also mentioned that the type of diabetes medication they took was Glibenclamide. This can be seen in the following quotes:

"The first diabetes medication I took was Glibenclamide 5 mg in the morning and evening... (P1).. "I take glibenclamide once a day, 10 mg in the morning (P5). "I sometimes take Gliben 5 mg... (P6).". "…and Gliben 10 mg (P9)." . "Sometimes Gliben 10 mg every morning (P11)."

A different perspective was shared by other participants. They did not take diabetes medication. This can be seen in the following quote:

"Some were given by the health center but have run out; I don't know the name of the medication (P4)." "I don't take any. I don't know (P8, P12, P14)." The diabetes medication dosage consumed by most participants was Metformin 500 mg/day. Some participants consumed Glibenclamide 1 x 10 mg/day. Participants P1, P9, and P10 consumed Insulin 8–18 units, while participants P4, P8, P12, and P14 did not take any medication. The DFU medications consumed were Cefadroxyl 3x500 mg (P1),

Metronidazole 3x500 mg (P2), and Amoxicillin 3x500 mg (P5). The other participants did not mention the dosage of wound medications they consumed.

I. Theme 6 Self-Monitoring of Blood Sugar

1) Normal Blood Sugar

Some participants did not know the normal blood sugar level in the human body. This can be seen in the following excerpt:

"Don't know (P1, P2, P3, P6, P7, P8, P9, P11, P12, P14)".

This differs from the perception of other participants. Participants are aware of normal blood sugar levels in the human body. This can be seen in the following quote: "120 (P4)." "90–120 (P10, P13)."

Another participant's perception was also different. The participant mentioned blood sugar levels, but their statement did not align with normal levels. This can be seen in the following quote: "200–300 (P5)."

The results of the study showed that most participants did not know what normal blood sugar levels were. Three participants said 120 mg/dl, while P5 said 200-300 mg/dl. These findings align with Tinungki's 2023 study on Kawaluso Island, which found that the community's understanding of diabetes prevention was inadequate and that their behavior toward preventing diabetes was largely negative. The study also revealed that most respondents had never had their blood sugar checked (65.63%). Blood sugar Normal fasting blood glucose levels in tests range from 70–99 mg/dL, and plasma glucose levels 2 hours after TTGO range from 70–139 mg/dL (Tinungki et al., 2023).

2) Blood sugar monitoring

Some participants reported that they monitor their blood sugar daily. This can be seen in the following quotes:

"Every day (P3)." "Every morning during wound care (P9)."

Some participants also reported that they monitor their blood sugar three times a week. This can be seen in the following quotes:

"3 times a week (P7)." "3 times a week (P10)." Some participants also said that they monitor their blood sugar every month. This can be seen in the following quotes: "Once a month (P1)‖. "Every month (P12)". "Every month (P13)". "Once a month (P14)".

Some participants said something different. They rarely monitor their blood sugar. This can be seen in the following quotes: "Occasionally (P2)." "Occasionally (P2).". "Four times since August until now (P4)." "Rarely. Every three months" (P5, P8)." "Rarely (P6)." "Every three months (P11)." The results of the study show that most participants monitor their blood sugar once a month. Participants (P5, P, 8, P11) monitor their blood sugar every three months. Participants P7 and P10 monitor three times a week. P2 only occasionally, P4 monitors blood sugar every four months, and P6 rarely. However, those who regularly monitor blood sugar are participants P7 and P10, who monitor three times a week, and P3 and P9, who monitor daily.

3) Where to get blood sugar tests

Some participants got their blood sugar tested at health care facilities. This can be seen in the following quotes:

"At the Manganitu Community Health Center (P1, P2)."

"At the Village Hall, Community Health Center, and Posbindu (P4, P8)." "I get checked when I see the doctor (P5, P6)."

"... Community Health Center."

"To the clinic where the nurse treats wounds (P11, P12, P13)." "To Posbindu (P14)." Another participant mentioned something different. Blood sugar checks are done at home. This can be seen in the following quote:

"At home (P3, P7, P9, P10)." The results of the study indicate that most participants in P1, P2, P4, P8, P10, and P14 underwent blood sugar tests at community health centers or Posbindu. Meanwhile, participants in P5, P6, P12, and P13 underwent blood

sugar tests at clinics run by doctors and nurses. Participants in P3, P7, P9, and P10 underwent blood sugar tests at home. 4) Blood sugar levels of participants in the last 6 months of testing Several participants stated that their blood sugar was controlled at 110-200 mg/dl in the last 6 (six) months of testing. This can be seen in the following excerpts:

“110 (P1)”.

“Last month 180 milligrams (P2)”.

“150–200 mg/dl (P9).”

“120–200 mg/dl (P10).” However, some other participants reported different results. They stated that their blood sugar levels in the past 6 (six) months were 200–418 mg/dl in the past 6 (six) months. This can be seen in the following quote: “The highest is 300 millimeters, the lowest is 83. Sometimes it is 100, 120, or 150 millimeters (P3).”

“The first is 418 millimeters, the second is 192, the third is 342, and the fourth is 378 millimeters (P4).”

“250 millimeters (P5).”. “275 millimeters (P6).”. “200-300 millimeters (P7, P14).”. “400-500 millimeters (P8).”

“300-450 millimeters (P11).” “275-300 millimeters (P12).”. “ 300-400 milliliters (P13)”.

Blood sugar levels over the past 6 (six) months that have been controlled are as follows: Participants (P1, P2, P9, P10, P14) reported blood sugar levels ranging from 110 to 200 mg/dl. Meanwhile, Participants P5, P6, P7, and P12 reported blood sugar levels ranging from 250 to 300 mg/dl. Participants P3, P4, P11, P8, and P13 reported blood sugar levels between 300–418 mg/dl. Soelistijo et al. in Tinungki et al. 2023 state that an individual diagnosed with diabetes is identified through blood laboratory tests. Fasting blood glucose ≥ 126 mg/dl and plasma glucose level 2 hours after TTGO is ≥200 mg/dl. The implementation of TTGO according to the WHO is as follows: 1) Three days before the examination, the patient should continue eating (with sufficient carbohydrates) and engage in physical activities as part of their daily routine, 2) Fast for at least 8 hours before the test, but drinking plain water without glucose is permitted, 3) Fasting blood glucose levels are measured, 4) Administer 75 grams of glucose (for adults) or 1.75 g/kg body weight (for children) dissolved in 250 ml of water and consumed within 5 minutes. 5) Fast again until blood samples are taken for testing 2 hours after drinking the glucose solution, 6) Test blood glucose levels 2 hours after the glucose load, 7) During the testing process, patients should not smoke and should remain at rest.

J. Theme 7 Foot Care

1) How do you wash diabetic foot ulcers?

Most participants washed the wounds using NaCl infusion fluid, as seen in the following excerpts:

“...With NaCl infusion fluid (P1).”

“… I also use a type of wood called tetule wood, placed in the infusion solution. That’s for cleaning the wound and drying it… (P2).”

“For my husband’s wound, I clean it with infusion solution…, (P4).” “ …Use infusion solution (P5).” I treated it using infusion water… (P6).” “Cleaning the wound with infusion fluid… (P7).” “ Washing the wound with infusion fluid (P11).”. “ ‖ Washing the wound with infusion fluid… on the wound (P12). “ Cleaning with NaCl … (P13).”

Some participants washed the wound using clean water and warm water, as seen in the following excerpts:

“Washing the wound with clean water (P9).” “Cleaning with warm water… (P14).”

However, some participants washed diabetic foot ulcers using Rivanol, as seen in the following excerpts: “Cleaning the wound with Rivanol until clean and bandaging (P10)”. One participant washed diabetic foot ulcers using alcohol, as seen in the following excerpt: Cleaning wounds with... alcohol and bethadine (P7).

Some participants used the services of nurses to wash their wounds. This can be seen in the following excerpt:

“ Fluids used by wound nurses (P3, P8).

The research results show that the methods used by participants (P1, P3, P4, P6, P7, P9, P10, P13, P14) to clean diabetic foot ulcers were mostly using NaCl infusion fluid. Some also used clean water or warm water (P5, P8, P11, P12). Some used alcohol (P7 and P14) and one participant (P2) used NaCl fluid mixed with traditional ingredients. The way most participants cleaned wounds with NaCl infusion solution aligns with Moenadjat's 2006 study findings that one of the common complications is gangrene/ulcers, where skin integrity is damaged due to impaired peripheral circulation, causing surrounding tissue to die or become necrotic and undergo decomposition. Ineffective and delayed wound care can trigger the development of wounds on the feet of diabetic patients, potentially leading to complications such as amputation. Some types of wound care include foams, honey, hydrogels, alginates, and polyurethane film. For patients, treatment is tailored to their economic circumstances. For practical and inexpensive wound care, liquid antiseptics (NaCl or RL) are usually used to debride the wound, and sterile gauze is applied with the addition of antibiotics such as chloramphenicol, tetracycline HCL, 1% silver sulfadiazine, basitracin, bioplacenton, and gentamicin sulfate are commonly used antibiotics but may have adverse effects such as increased bacterial colony counts in the wound, causing pain, and sensitivity to sulfa.

2) How participants removed dead tissue.

Some participants said that the way to remove dead tissue was to clean it with gauze. This can be seen in the following excerpts:

“Just cleaned it with gauze (P1).” “I cleaned it with gauze (P5, P6).” “Remove using gauze (P10).” “Clean with sterile gauze (P13).”

One participant said that the way to remove dead tissue is to use a sharp stick. This can be seen in the following quote: “Use a sharpened stick (P2).”

Several participants also said that the way to remove dead tissue is to use sharp scissors. This can be seen in the following quotes: “Cut by my husband, which was already soft but still hard (P4).” “Remove using tweezers and scissors (P9).”

One participant stated that the method for removing dead tissue is to use the services of a nurse. This can be seen in the following quote:

“I didn't see it, but my nephew is a nurse (P3).” Some participants expressed a different opinion. They said that in treating diabetic foot ulcers, it is not necessary to remove dead tissue. This can be seen in the following quotes:

“Do not remove dead skin (P7, P11, P14).” “Do not remove (P8).”

The results of the study show that most participants removed dead tissue with gauze. Participants who used scissors were P4 and P9. Participant P2 used a sharp stick. P3 utilized the services of a wound care nurse. Meanwhile, some other participants did not perform dead tissue removal.

3) How participants treated DFU.

Some participants treated diabetic foot ulcers using honey, as seen in the following excerpts:

“…applied honey (P9).”. “I helped my father…apply honey (K9).”. “…then applied honey (P13).”

However, some participants treated diabetic foot ulcers using Metronidazole, as seen in the following quote:

“…sprinkled with metronidazole. This medication was taught by a friend whose child was at Pancaran Kasih Hospital in Manado (P4).”

“...Metronidazole tablets crushed and sprinkled on the wound (P12).” There were also participants and families who treated diabetic foot ulcers using Amoxicillin, as in the following quote: “... sprinkled with Amoxicillin (P14).”

International Journal of Progressive Sciences and Technologies (IJPSAT)
ISSN: 2509-0119.

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Some participants and families treated diabetic foot ulcers using wound ointment from wound nurses as well as wound care by certified nurses, as cited in the following excerpt: by a nephew who has expertise in treating diabetic wounds". P8 : "Cleaned by the wound nurse here".

However, some participants and their families treated diabetic foot ulcers using traditional medicine, as in the following excerpts:

"I treat it every day with turmeric and those leaves, but it doesn't heal... (P1).

"…For the internal medicine, I grind garlic and drink the juice. Sometimes I boil cinnamon and drink the water. For the wound, there's a traditional leaf called 'kapu Buwuhe' mixed with turmeric and applied to the wound (P2)." The study results show that the treatment used by most participants to treat diabetic foot ulcers is honey. Some participants (P4 and P12) used Metronidazole powder. P3 and P9 used wound care services. P1, P10, and P13 followed the doctor's advice from the hospital. Meanwhile, P2 used traditional medicine.

Zinc is an important element in the human body and is very important for health and disease. It functions as a cofactor in various transcription factors and enzyme systems, including zinc-dependent matrix metalloproteinases, which enhance autodebridement and keratinocyte migration during wound repair. Zinc provides resistance to epithelial apoptosis through cytoprotection against reactive oxygen species and bacterial toxins that may through the antioxidant activity of cysteine-rich metallothionein. Zinc deficiency caused by genetic factors or dietary patterns can lead to pathological changes and delayed wound healing. Oral zinc supplementation may be beneficial in treating patients with zinc deficiency and foot ulcers, but its therapeutic benefits in surgical patients require further clarification.

Topical zinc administration appears to be superior to oral therapy due to its action in reducing superinfection and necrotic material through enhanced local defense systems and collagenolytic activity, and the sustained release of zinc ions that stimulate wound epithelialization in normozincemic individuals. Zinc oxide in dressing paste (Unna boot) protects and soothes inflamed peri-ulcer skin. Zinc is transported through the skin from the formulation

This, despite the fact that its systemic effects appear to be insignificant. This study shows that topical zinc therapy is underutilized, despite clinical evidence indicating the importance of topical zinc therapy in autodebridement, anti-infective action, and promoting epithelialization (Wicker et al., 2016).

4) How participants prevent wounds from recurring.

Some participants prevent wounds from recurring by not scratching itchy skin. This can be seen in the following quotes: Do not scratch the skin…(P2)". Do not scratch again….(P3)". Do not scratch the skin again (P13). Some participants prevent wounds from recurring by food. This can be seen in the following quote:

-Do not eat food that does not contain flavoring (P2)‖.

Being careful about food (P10)‖.

Being careful about eating out (P14)‖.

Some participants prevented the wound from recurring by controlling their blood sugar to remain normal. This can be seen in the following quote:

-...will control sugar regularly (P3)‖.

‖.... sugar control (P9)‖. Some participants prevented the wound from recurring by controlling themselves and being careful, always wearing sandals and not touching the wound. This can be seen in the following quote:

-Not going to the garden and not touching the wound (P1)‖.

- Self-control and caution (P7)‖.

"Be careful and always control yourself... (P9)".

"Be careful not to get hurt again, wear sandals if you are inside the house or outside the house (P11)‖. Different participants stated that they did not know how to prevent the wound from recurring. This can be seen in the following quote:

-Don't know ses (P4, P12)‖.

"Don't know (P5, P6, P8)‖.

The results showed that most of the participants did prevent wounds from recurring by being careful, controlling blood sugar, not scratching the skin, and not eating food containing flavorings. Participants P4, P5, P6, P8 and P12 did not know how to prevent wounds from recurring.

The results of this study are in line with the research of Wade et al, 2008 that a person's behavior can change if there is an imbalance between the two forces in a person. Experience will greatly affect how a person prepares something that is felt (known, done, and perceived) is also an awareness of something caught by the human senses, the perception is not only determined by the stimulus (stimuli) objectively, but also influenced by the perceptor's self-awareness.

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