A DESCRIPTIVE STUDY TO ASSESS THE KNOWLEDGE REGARDING CARE OF DIABETIC FOOT AMONG PATIENT WITH DIABETES MELLITUS, ATTENDING OUT-PATIENT DEPARTMENTS IN SELECTED HOSPITALS OF DISTRICT PATIALA, PUNJAB WITH A VIEW TO DEVELOP AN INFORMATIONAL BOOKLET.

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CHAPTER - I
BACKGROUND OF THE STUDY

1.1 INTRODUCTION

“You can live with diabetes. Its not the worst thing to have, but you have to mange yourself and have some self control.”

Tony Rock

Diabetes mellitus, commonly known as diabetes, is a group of metabolic disorders characterized by high blood sugar levels over a prolonged period. Symptoms of high blood sugar include frequent
urination, increased thirst, and increased hunger. If left untreated, diabetes can cause many complications. Acute complications can include diabetic ketoacidosis, hypermolar hyperglycemic state, or death. Serious long-term complications include cardiovascular disease, stroke, chronic kidney disease, foot ulcers, and damage to the eyes.²

There are two principle forms of diabetes: Type 1 diabetes (formerly known as insulin-dependent) in which the pancreas fails to produce the insulin which is essential for survival. This form develops most frequently in children and adolescents, but is being increasingly noted later in life. Type 2 diabetes (formerly named non-insulin-dependent) which results from the body's inability to respond properly to the action of insulin produced by the pancreas. Type 2 diabetes is much more common and accounts for around 90% of all diabetes cases worldwide. It occurs most frequently in adults, but is being noted increasingly in adolescents as well.³,⁴

The symptoms of diabetes may be pronounced, subdued, or even absent. In Type 1 diabetes, the classic symptoms are excessive secretion of urine (polyuria), thirst (polydipsia), weight loss and tiredness. These symptoms may be less marked in Type 2 diabetes. In this form, it can also happen that no early symptoms appear and the disease is only diagnosed several years after its onset, when complications are already present. Recently compiled data show that approximately 150 million people have diabetes mellitus worldwide, and that this number may well double by the year 2025. Much of this increase will occur in developing countries and will be due to population growth, ageing, unhealthy diets, obesity and sedentary lifestyles. By 2025, while most people with diabetes in developed countries will be aged 65 years or more, in developing countries most will be in the 45-64 year age bracket and affected in their most productive years.⁴

As WHO 2017, an estimated 425 million people had diabetes worldwide, with type 2. Recently compiled data show that approximately 150 million people have diabetes making up about 90% of the cases. This represents 8.8% of the adult population, with equal rates in both women and men. Trend suggests that rates will continue to rise. Diabetes at least doubles a person's risk of early death. In 2017, diabetes resulted in approximately 3.2 to 5.0 million deaths. The global economic cost of diabetes related health expenditure in 2017 was estimated at US$727 billion. In the United States, diabetes cost nearly US$245 billion in 2012.⁵

A diabetic foot is a foot that exhibits any pathology that results directly from diabetes mellitus or any long-term (or "chronic") complication of diabetes mellitus. Presence of several characteristic diabetic foot pathologies such as infection, diabetic foot ulcer and neuropathic osteoarthropathy is called diabetic foot syndrome. Due to the peripheral nerve dysfunction associated with diabetes (diabetic neuropathy), patients have a reduced ability to feel pain. This means that minor injuries may remain undiscovered for a long while. People with diabetes are also at risk of developing a diabetic foot ulcer. Research estimates that the lifetime incidence of foot ulcers within the diabetic community is around 15% and may become as high as 25%.⁶
In diabetes, peripheral nerve dysfunction can be combined with peripheral artery disease causing poor blood circulation to the extremities (diabetic angiopathy). Around half of patients with a diabetic foot ulcer have co-existing peripheral artery disease. Where wounds take a long time to heal, infection may set in and lower limb amputation may be necessary. Foot infection is the most common cause of non-traumatic amputation in people with diabetes.6

Prevention of diabetic foot may include optimising metabolic control via the regulation of blood glucose levels, identification and screening of people at high risk for diabetic foot ulceration, and patient education in order to promote foot self-examination and foot care knowledge. Patients would be taught routinely to inspect their feet for hyperkeratosis, fungal infection, skin lesions and foot deformities. Control of footwear is also important as repeated trauma from tight shoes can be a triggering factor, especially where peripheral neuropathy is present. There is however only limited evidence that patient education has a long-term impact as a preventative measure.6

In all methods proposed to prevent diabetic foot ulcers, only foot temperature-guided avoidance therapy was found beneficial in RCTs" according to a meta-analysis.6

Treatment of diabetic foot can be challenging and prolonged; it may include orthopaedic appliances, antimicrobial drugs and topical dressings. Most diabetic foot infections require treatment with systemic antibiotics. The choice of the initial antibiotic treatment depends on several factors such as the severity of the infection, whether the patient has received another antibiotic treatment for it, and whether the infection has been caused by a micro-organism that is known to be resistant to usual antibiotics. The objective of antibiotic therapy is to stop the infection and ensure it does not spread.6

Globally, non-communicable diseases such as hypertension, diabetes mellitus, and cardiovascular disease are the leading cause of death attributing to 63% of overall causes of mortality. Over nine million deaths due to chronic disorders occur below the age of 60 years, and 90% of them are from middle and low-income countries. Around three million deaths worldwide occur due to diabetes among 347 million people suffering from it. According to World Health Organization (WHO) projections by the year 2030, it will be the seventh leading cause of death. In India, NCD contributes to 53% of total mortality, and around 2% of it is contributed by diabetes mellitus. Diabetes can lead to several complications, the important being the complications related to foot. A lower limb is lost every 30 seconds globally, and it is estimated that at least 25% cases of diabetes are at risk of developing a foot ulcer. 40-70% of lower limb amputations are related to diabetes. People are suffering from any diabetic related to complications, uncontrolled diabetes, males, and having diabetes for more than 10 years have increased the risk of developing foot-related complications. Routinely foot examination in diabetic individuals is done annually. People with neuropathic disorders are advised to get a visual inspection of their foot during every visit. Patients are examined for the presence of bony deformities, callous formation, erythema, and limitation in joint
mobility. The most cost effective measure of preventing foot-related complications is enhancing the knowledge and awareness among diabetic patients. Patients with preexisting complications are mainly provided with health education. Patients with low risk are usually neglected. If diabetes is not controlled, even patients with low risk can also develop complications. American Diabetic Association and International working group on diabetic foot have issued guidelines regarding diabetic subjects with low risk. Various studies have indicated that adequate self-care of foot is not followed among diabetic patients.

Nearly 415 million people globally have diabetes, with 75% living in low and middle income countries. In India about 70 million people have diabetes, and the number is projected to rise to 125 million by 2040. The National Institute for Health and Care Excellence guideline on diabetic foot recommends a three-tier system for foot care, primary healthcare for preventive services and appropriate referral of diabetic foot, foot protection services at community level for podiatric care and management of simple foot problems, and multidisciplinary foot care services at tertiary level to handle complex foot problems. In low and middle income countries, primary care doctors are not trained in diabetic foot care, podiatry as a discipline is emerging, and multidisciplinary foot care services are available at few tertiary care centres. 

The WHO proposed that diabetes will be the seventh leading cause of mortality in 2030. Over 1 million lower limbs are lost due to diabetes globally every year. In 2008, an estimated 347 million people in the world had diabetes and the prevalence is growing, particularly in low- and middle-income countries. India had 69.2 million people living with diabetes as per the 2015 data. India is also called “The Diabetes capital of the world”. It has become major health and socioeconomic burden to family and healthcare system. Interventions that are both cost-effective and feasible in developing countries include lifestyle changes such as exercise low sugar and low saturated fat diet, avoidance of tobacco. In 2015, almost 1.6 million mortality was directly related with diabetes. Another 2.2 million deaths were due to high blood glucose. Mechanical stresses from poorly fitted shoes attributes to corns and calluses. Practice of keeping the foot wet for long time predispose to fungal infection. Less education was related with less knowledge about foot care.

The training in primary care doctors in diabetic foot care, particularly in countries with a high burden of diabetes. Referral hospitals should develop diabetic foot centre under the specialty of general surgery. These centre would provide foot protection services such as callus debridement and nail care, and surgeries such as wound debridement and minor or major amputations. Multidisciplinary foot care services should be provided at all tertiary level hospitals with facilities for vascular intervention and orthoses. The main aim of the study is provide the knowledge regarding foot care among diabetic patients attending out-patient departments in selected hospital Patiala, Punjab.
1.2 NEED OF STUDY

“We must vote for hope, vote for life, vote for a brighter future for all of our loved ones.”

Ed Markey

The increasing incidence of diabetes mellitus which represents a group of chronic diseases characterized by high levels of blood glucose resulting from defects in insulin action, production or both has become a major health concern worldwide. One of the most common complications of diabetes in the lower extremity is the diabetic foot ulcer. An estimated 15% of patients with diabetes develop a lower extremity ulcer during the course of their disease. Diabetic foot is a complex and heterogeneous disorder that affects 1 out of 5 patients with diabetes at least once in his or her lifetime with relevant consequences both on lower limb survival and general morbidity.

In most developed countries diabetes is now thought to be in excess of 200 million. This figure is predicted to reach 333 million by 2025 as a consequence of stress, sedentary life style and changing dietary patterns. Diabetes is the global epidemic of the 21st century and is now the fourth leading cause of death. WHO estimates that every fifth diabetic is an Indian. At present there is no cure. This global epidemic will affect everyone, everywhere. Diabetes mellitus is a non-communicable disease with multi-organ involvement. It was known even in the ancient world as a disease that produces honey taste. Diabetes is a serious chronic disease that needs attention.
According to the international consensus guidelines’ protocols, such a complex pathology necessitates the participation of a multidisciplinary team, including the diabetologist, the podiatrist, the vascular surgeon and the infectious disease specialist, to manage and address all the various aspects and presentations of the pathology. Only about half of patients actually notice the lesion themselves, with the majority occurring on the digits. Ill-fitting footwear frequently contributes to foot ulceration. Inadequate shoe fitting cannot be felt in those patients with sensory neuropathy. Ulcers can form because of tight-fitting shoes causing constant pressure. However, loose shoes also cause ulcers, as a result of friction. Neuropathy of the A-type nerve fibre results in ataxic gait and intrinsic weakness of the foot muscles. Neuropathy of the C-type sensory fibres is the loss of protective sensation, it results in the loss of pain threshold with prolonged and increased shear forces and repeated trauma. In addition, loss of protective sensation due to peripheral neuropathy is the most common cause of ulceration.9

Major complications of Type 2 diabetes include diabetic foot and diabetic peripheral neuropathy; that constitutes an increasing public health problem with increasing admission rate, cost, amputation risk, and mortality in diabetic patients. Approximately, 27% of the direct medical cost of diabetes may be attributed to diabetic peripheral neuropathy. Diabetic patients have a15–25% lifetime risk of developing a diabetic foot ulcer and one out of 6 patients will have a lower-limb amputation, with an associated increase in mortality ranging from 47% to 70%. The symptoms of diabetic peripheral neuropathy show a discrepancy; between patients however, initially it begins with sensory loss that makes diabetic patients more liable to foot ulcers and increasing risk of leg amputation.11

The common component causes of diabetic foot ulcer formation are trauma, neuropathy and deformity. Education and awareness of diabetic foot ulcer pathway and the existing foot care measures that are intended to control them are paramount in foot ulcer prevention strategies. Nonetheless, having knowledge of the foot care alone will not be beneficial unless practiced with good compliance. Efforts have been made to increase public awareness of diabetic foot in the forms of health campaigns, public service advertisements and education by primary healthcare workers. However there are no studies in the literature that assess the current level of awareness of diabetic foot care in our diabetic patients.

The practice of foot care measures such as daily foot washing and drying, daily foot examination, proper nail care, and footwear are important in regard to prevention and early detection of the expected complications. Patients with poor knowledge and practices about diabetic foot care have a higher incidence of diabetic foot complications. Studies suggest that increasing awareness about diabetic foot care practices may reduce diabetes related foot ulceration and amputations and facilitate healing of foot ulcers. Knowledge about the above mentioned foot care practices varies among studies.11

(WHO Fact Sheet 2017) According to International Diabetes Federation’s India is home to over 61 million diabetic patients — an increase from 50.8 million last year. By 2030, India’s diabetes burden is
expected to cross the 100 million. The country is also the largest contributor to regional mortality with 983,000 deaths caused due to diabetes this year. International Diabetes Federation’s fifth diabetes atlas has released the staggering figures. International Diabetes Federation’s says India’s prevalence of diabetes among 20-79 year olds is 9.2%. India is only second to China, which has 90 million diabetics (2011) that will increase to about 130 million by 2030. International Diabetes Federation's says, —New figures indicate the number of people living with diabetes is expected to rise from 366 million this year to 552 million by 2030, if no action is taken. This equates to approximately three new cases every 10 seconds or almost 10 million per year. In 2017, South Asia accounted for 71.4 million diabetics. This number is expected to increase to 120.9 million by 2030. The Atlas said, —Four in every five diabetics are between 40 and 59 years.12

Sita Chatterjee et.al.(2017) conducted a cross-sectional study to assess the knowledge and practices of foot care among patients attended diabetic clinic in tertiary care hospital of Kolkata among 275 patients. About 71.27% & 40% had good knowledge & practice respectively; 62.91% checked their feet daily; 42.91% inspect their footwear regularly; 90.81% used footwear outdoors; 6.91% used footwear indoor; washing & drying of feet was present in 78.91% & 18.90% respectively; healthy nail trimming was found in 61.81% of the patients. Gender, residence, education, occupation, income, family history of diabetes, duration, regular use of medication was found to be associated with both knowledge & practice. Patient education on prevention of foot ulceration should be incorporated into the routine care of diabetic patients both in the hospital and in the community.13

Deepa L.N et. al.(2017) conducted a cross sectional descriptive study to determine the level of awareness and practice of foot care among type 2 diabetes patients attending a tertiary care center in Kolar among diabetic patients using pretested questionnaire. In the present study the mean of awareness and practice of foot care were 5.33 (3.09) and 6.54 (2.94) respectively. Low mean scores were significantly associated p 6.54 (2.94) respectively. Low mean scores of awareness and practice suggests that there is a need for focused educational intervention on foot care to all diabetic patients in order to prevent foot complications in them.14

The International Diabetes Federation has focused on the micro and macrovascular complications associated with Diabetes mellitus. In 2015, the International Diabetes Federation committed to execute the management approach for diabetic foot diseases. The risk for developing foot ulcers is 25% high in patients with diabetes and it is also reported that every 30 seconds, one lower limb amputation in diabetes patients occurred around the world. The International Diabetes Federation has now become proactive and declared in its mandate that now is the time to increase awareness about the foot complications associated with Diabetes mellitus in scenarios of social, personal, clinical and economic costs.15
Currently, India is a country with the second-highest number of people with type 2 Diabetes Mellitus. With this, there is a rise in associated complications as well which has increased individual’s health expenditure. A 2018 study estimates 7% adults with diabetes in India, with a higher level in urban (9.8%) than in the rural area (5.7%), a higher proportion of males (7.1%) than females (6.8%). A rural Indian study cited that the prevalence of diabetic foot ulcer among outpatient and inpatient diabetics was found to be 10.4% and around 8.7% of people with diabetes suffered from foot ulcers during 1st year of onset. The diabetic foot ulcers frequently become infected and are the common cause of lower extremity amputation in these patients. Diabetic foot ulcer incidence has been proved to decrease with consistent foot care education. In developing countries like India, where the resources are limited, and treatment costs for diabetes are constantly increasing, the self-care component among patients with diabetes may lead to better economic and therapeutic outcomes.

Diabetic foot is a severe complication associated with Diabetes mellitus that shows the presentation of deep lesions of tissues intermingled with neurological disorders and peripheral vascular disease of lower limbs. A previously published study showed that the average annual expenditure of diabetic foot care is US$8659 per patient. The total medical cost for the management of diabetic foot disease in the United States ranges from US$9 to US$13 billion in addition to the cost for management of Diabetes mellitus alone. It is estimated in diabetic patients that of all amputations, 85% are contributed by foot ulceration which further deteriorates to chronic infection and severe forms of gangrene. Ongoing research of prevalence of diabetic foot ulcers around the world does not tell the exact figure, thus a contemporary and comprehensive evaluation along with upgradation of diabetic foot ulcers epidemiology is needed in order to provide up-to-date information about the management of diabetes care and the economic burden.16

Some environmental factors like increasing urbanization, unhygienic conditions, poverty, frequent co-existing HIV infection, barefoot walking, low income, and cultural practices have also been said to compound the situation. People with diabetes are prone to develop foot ulcer, amputation and other lower extremity clinical abnormalities if they do not have good knowledge of foot care practice. Therefore, the aim of the study was to educate the diabetic patients, at primary level, about foot care, hypoglycaemia, diabetic diet, insulin administration and exercise to reduce the foot complications produced by the diabetes knowledge about diabetes and care of foot can reduces the foot ulceration and amputation of foot of the patients and preventing the foot ulcer.

Further, during experience the investigator observed that patient with Diabetes Mellitus are develop complication and may occure death due to less alertness. Hence the investigator wishes to develop informational booklet regarding care of diabetic foot among diabetic patients who are attending out-patient departments, which will improve the knowledge of diabetic patients.

1.3 RESEARCH PROBLEM
A Descriptive study to assess the knowledge regarding care of diabetic foot among patients with Diabetes Mellitus, attending out-patient departments in selected hospitals of district Patiala, Punjab with a view to develop an informational booklet.

1.4 AIM OF THE STUDY

The aim of study to assess the knowledge regarding care of diabetic foot among patients with Diabetes Mellitus, attending out-patient departments in selected hospitals of district Patiala, Punjab.

1.5 OBJECTIVES OF THE STUDY

- To assess the knowledge regarding care of diabetic foot among patients with Diabetes Mellitus, attending out-patient departments in selected hospitals of district Patiala, Punjab.
- To find out the association between knowledge score regarding care of diabetic foot among patients with Diabetes Mellitus, attending out-patient departments in selected hospitals of district Patiala, Punjab.
- To distribute an informational booklet regarding care of diabetic foot among patients with Diabetes Mellitus, attending out-patient departments in selected hospitals of district Patiala, Punjab.

1.6 ASSUMPTION

- Knowledge regarding care of diabetic foot will be inadequate.

1.7 OPERATIONAL DEFINITIONS

- **Assess**: Evaluate or estimate the nature, ability, or quality. In this study, it refers to determine the knowledge of diabetes mellitus patients regarding care of diabetic foot

- **Knowledge**: Knowledge is familiarity, awareness, or understanding of someone or something. It refers to the awareness or familiarity regarding care of Diabetic foot among patients with Diabetes Mellitus.

- **Care**: The provision of what is necessary for the health, welfare, maintenance, and protection of someone or something, serious attention.

- **Diabetic Foot**: A diabetic foot is a foot that exhibits any pathology that results directly from diabetes mellitus or any long-term (or "chronic") complication of diabetes mellitus. Presence of several
characteristic diabetic foot pathologies such as infection, diabetic foot ulcer and neuropathic osteoarthropathy is called **diabetic foot syndrome**.

- **Diabetes Mellitus**: Diabetes mellitus, commonly known as diabetes, is a group of metabolic disorders characterized by high blood sugar levels over a prolonged period. Symptoms of high blood sugar include frequent urination, increased thirst, and increased hunger.

- **Out-patient departments**: Out Patient Department is where one consults a doctor according to their issues. Out-patient means patients who are not admitted to the hospitals.

### 1.8 DELIMITATION

The study is limited to patients with Diabetic Mellitus who are attending out-patient departments in selected hospitals of district Patiala, Punjab.

### 1.9 CONCEPTUAL FRAMEWORK OF THE STUDY

Conceptual framework presented logically constructed concepts to provide general explanation of the relationship between the concepts of the research study, without using single exiting theory. Conceptual frameworks are usually constructed by using researcher’s own experiences, previous research findings, or concepts of several theories or models.

This study is intended assess the knowledge, attitude and preference regarding contraceptive methods among eligible couples living in selected rural area with a view to develop an informational booklet.

The conceptual framework used in the present study is modified Nola Pender’s Health Promotion model. The health promotion model was proposed by Pender in 1982 and revised in 1996. Pender’s model focus on intervention that affect communities, therefore producing a healthier population.

Pender defined health as not only the absence of disease, but a dynamic state of well-being(1996).

The model illustrates the multifaceted nature of person interrelating to their environment in pursuit of health. Pender (1996) reported three concepts that are central to this model: individual characteristics and experience, behaviour specific cognitions and affect and behavioural outcomes.

Present study utilizing the revised model indicate that the perceived self-efficacy, benefits and barriers are better predictors and have greater influence on health related behaviours. The patient’s perception of his self-efficacy is directly affected by whether he perceives the activity a positive or negative experience.

The way a person perceives and understands a situation can directly or indirectly affect health behaviour. While health promotion model was developed to explain health promoting behaviours, it can also be used for health protecting behaviours.
MAJOR CONCEPTS OF THE HEALTH PROMOTION MODEL

Individual characteristics and experiences:-

- Prior health related behaviour:-

According to the model it is the frequency of the similar behaviour in the past.

In this study prior related behaviour are knowledge of patient with diabetes mellitus regarding care of diabetic foot attending out-patients department in selected hospitals of district Patiala.

Personal and professional factors:-

These factors are categorized as biological, psychological and socio-cultural which are predictive of a given behaviour and shaped by the nature of target behaviour being considered.

In this study factors included are Age, Education, Occupation, Religion, Marital Status, Type of work, Monthly income, Family history, Duration of disease, Awareness about diabetic foot care, Source of information.

Behaviour- specific cognition and affect:-

- Perceived benefits of action:-These are the anticipated positive outcomes that will occur from health behaviour. In the present study prevention from complication and improvement in health through enhancement of knowledge patients with diabetes mellitus.

- Perceived barriers to action:-These are anticipated, imagined or real blocks to change in behaviour. In this study perceived barriers to terminology regarding contraceptive methods, inadequate knowledge.

- Perceived self-efficacy:-It is judgement of personal capability to organize and execute a health promoting behaviour.

In this study, Patient with Diabetes Mellitus deals with care of diabetic foot.

- Activity related effects:-Subjective negative and positive feeling that occur before or during the following behaviour based on the stimulus properties of the behaviour itself.

In this study, improvement in knowledge of diabetes mellitus patients.

- Interpersonal influences:-Cognition concerned behaviour, beliefs or attitude of the others. Interpersonal influences include norms and modelling.

In the present study family, relatives, health personnel
Situational influences: Personal perceptions and cognitions of any given situation that can facilitate behaviour. Situational influences may have direct or indirect influence on health behaviour.

In present study, health resources, mass media

**Behavioural outcome:**

- **Commitment to plan of action:**
  
The concept of intention and identification of a planned strategy leads to implementation of health related behaviour. In this study the commitment of plan of action is develop an informational booklet regarding contraceptive methods to enhance knowledge of patients with diabetes mellitus.

- **Competing demands and preferences:**
  
Competing demands are those alternative behaviour over which individuals have low control because there are environmental such as work or family care. Competing preference are alternative behaviour over which individual exert relatively high control. In this study competing demands and preferences are assessment and comparison of knowledge as average.

- **Health promoting behaviour:**
  
It is the end point or action outcome directed towards attaining positive health outcome such as optimal well-being, personal fulfilment and productive living.

In the present study have average knowledge of diabetes mellitus patients. The diagrammatic representation of conceptual framework is presented in figure no.1

**Summary**

This chapter deals with the background and need of the study, statement of problem, objectives, operational definitions, assumptions, delimitations and conceptual framework.
CHAPTER II
REVIEW OF LITERATURE

“A literature review is a comprehensive summary of previous research on a topic. The literature review surveys scholarly articles, books, and other sources relevant to a particular area of research.”

Coffta, Michael

This chapter deals with the related literature review which aids to generate a picture of what is know about a particular situation.

Review of literature for present study is categorized under the following heading.

**Literature related knowledge regarding care of diabetic foot**
Hassan K Abdulwassi et.al.(2020) Conduct study to evaluate medical students’ knowledge of diabetic foot care management and its related factors. This was a cross-sectional, descriptive study of 303 students studying at King Abdulaziz University Hospital, Jeddah, Saudi Arabia conducted from June to July 2019. Data were collected using a two-part questionnaire. The first one captured student information; the second assessed student knowledge. It consists of 68 true and false questions divided into 4 subscales (risk factors, foot examination, foot complications and footwear selection). The higher the total score is, the higher the students' knowledge. The total average knowledge score was 55.5±5.5 out of 68. Students who educated diabetic patients, preformed foot exam, or attended extra elective clinical rotation in a diabetic foot team, had a significantly higher knowledge level. Students were found to have high level of knowledge regarding diabetic foot management.

J. Deign Maria, J. Jomal et.al.(2019) conducted study to assess the knowledge, practices, and risk of diabetic foot syndrome among diabetic patients seeking outpatient care at a tertiary hospital in Bengaluru, India. A cross-sectional study involving 198 patients with diabetes aged ≥18 years was conducted using a structured questionnaire, followed by examination using In low’s 60-second diabetic foot screen tool. The results were based on the International Working Group on the Diabetic Foot risk classification system. The knowledge regarding diabetic foot syndrome was inadequate for fungal infections (23.5%), shoe bites (26.5%), and changes in foot colour and temperature. Foot care practices were satisfactory, with the exception of wearing footwear indoors (25.0%) and applying moisturizers to feet (19.0%). Lack of education, diabetic neuropathy, peripheral vascular disease, history of foot ulcer, and a lack of knowledge regarding dry skin, special footwear, and inappropriate footwear were important risk factors. The researchers concluded that the knowledge level of the subjects was relatively poor.

F.Tehseen, M. Zahid et. al.(2019) Conduct study is to evaluate the knowledge and practices regarding foot care in diabetic patients presenting with foot ulcers in a tertiary care hospital of Karachi, Pakistan. This cross-sectional study was conducted at a specialised foot clinic of Baqai Institute of Diabetology and Endocrinology, a tertiary care hospital of Karachi, Pakistan. All patients with type 2 diabetes presenting with a history of foot ulcers were included in the study after taking informed consent. The interview was conducted by a trained healthcare professional on one-to-one basis. Patients who scored >70% had good knowledge and practices of foot care, those between 50% and 70% had average and those who scored <50% had poor knowledge and practices of foot care. A total of 358 patients were included in the study. Overall, 7% of the study participants had good foot care knowledge and practices, 55.3% had average and 37.7% had poor foot care knowledge and practices. Knowledge and practices of foot care were found to be unsatisfactory in most of the patients.

K. Munawar, A. Kamran et.al.(2019) Conduct study to access the knowledge and attitude of nurses on diabetic foot prevention, care and management. It is a cross-sectional descriptive study done at Pakistan Institute of Medical Sciences Islamabad for period of three month from August 2018 to October 2018.
was collected from 150 nurses through pretested, structured questionnaire containing question to access the knowledge, attitude and practice regarding diabetic foot prevention, care and management. We included all the nurses who processed at least one year of experience in surgical ward and specifically encounter patient with diabetic foot wounds. Data was collected and scored accordingly. The statistical analysis was performed through SPSS version 19.0. Only 56% of the nurses in our study possessed good knowledge of diabetic foot ulcers. Lack of formal wound care training was reported by 67%. The overall attitude of nurses towards was positive. Nurses demonstrated an overall positive attitude towards patients with diabetic foot ulcers. Nurses with experience had a markedly poor knowledge of diabetic foot care. The findings are helpful for instituting training courses. As a result, quality of diabetic foot care for patients will be improved.

Lakshmi N et.al.(2018) conducted a cross-sectional study to know the magnitude of the foot ulcer and to assess the level of foot care practice in BJ Medical College Ahmadabad city among the 150 diabetes patients. A pretest semi-structured questionnaire was used for data collection. The P level of 70%. Age < 0.05), educational status >5th standard (z = 3.08, P < 0.05) were significantly associated with good foot care practice. 11.3% (n = 17) had foot ulcer. Poor glycemic control (z = 3.099, P < 0.05) and loss of touch sensation (z = 8.004, P < 0.05) were significantly associated with the development of foot ulcer. The prevalence of peripheral neuropathy was 18% (n = 27). There were poor foot care practices among diabetic patients. Majority of them were wearing improper foot wear. Poor glycemic control and loss of touch sensation were associated with the development of foot ulcer.8

Hemin Jawad Sabar et.al.(2018) conducted a Cross sectional study to assess peripheral neuropathy and association between patients foot care knowledge and practice is central in diabetes management in Rizgary Teaching Hospital and Layla Qasim diabetic center in Erbil, Iraq among 250 patients. Statistical Package for Social Sciences version 25 used with a statistical significance level of < 0.05. The results presented as rates, frequencies, percentages in tables and analyzed using Chi-square test. The mean age of the sample was 53.75 ± 12.08 years. The mean knowledge and practice scores were 6.1 ± SD 2.6 and 5.8 ± SD 2.1, respectively. The majority of participants were of poor knowledge score and moderate practice score (38% and 40%, respectively). The percentage of neuropathy was 31.20%. The neuropathy was highest among those who had low knowledge score (P < 0.05). The mean knowledge and practice scores were moderate, knowledge had significant influence on practice. Peripheral neuropathy was significantly higher among those with low knowledge score.12

M. Karmakar, D. Mandal(2018)Conduct descriptive study to assess the foot self care knowledge & practice among the patient with diabetes mellitus in a selected hospital of Kolkata, 150 patients were selected from OPD of selected hospital Kolkata by using non probability convenient sampling technique. A semi structured questionnaire comprising of demographic variables & checklist for assessing knowledge of
foot self care & structured questionnaire for assessing practice of foot self care among patients with diabetes mellitus was used for data collection. The finding of the study revealed that, 86.67% had good knowledge where as in the practice 42.67% had satisfactory practice. Significant association (p>0.05) was found between treatment of diabetes mellitus and knowledge score of foot-self care and also association (p>0.05) was found between educational status, family history of diabetes mellitus and practice of foot-self care among the patients with diabetes mellitus.

M. Abuelgasim, A.R Ibrahim(2018) Conduct study to assess the knowledge, attitude, and practice of foot care among type 2 diabetic patients and to determine the relationship between proper foot care and diabetic foot lesions. This is an observational, descriptive, cross-sectional, hospital based study. It was conducted in the diabetic out-patient clinic at Al-Ribat University Hospital, in Khartoum, Sudan 2016. A total number of 156 type 2 diabetic patients were enrolled in this study; with 75% of the participants were females and 25% males. Duration of diabetes mellitus, exercise, smoking adherent to diabetic diet, type of therapy, co-morbidity, foot lesions, and foot care knowledge, attitude, and practice were tested. Regarding knowledge, attitude, and practice about diabetic foot care, 56.5% had good foot care knowledge, 70.5% had bad attitude, and 62.2% had moderate practice. Based on Chi square test of relationship between proper foot care and diabetic foot ulcer, there was association between bad knowledge, attitude, and practice about foot care and diabetic foot ulcer, P. values: 0.03, 0.036 respectively.

F. M. Mahmood(2018) Conduct study to assess the adherence of diabetic patients toward self-care of diabetic foot, and to identify the relationship between patient commitment and their own demographic characteristics. A cross sectional analytic study was carried out at the Center of Diabetic disease in AL-Husain Medical City, Holy Kerbala city for the period from 20/ 2/2017 to 25/6/2017 in order to assess the adherence of diabetes mellitus patients to word self-care of diabetic foot. A purposive (non-probability) sample of (100) patients patient who attending to diabetes center at Al-Hussein Medical city in Kerbala city were selected according to specific criteria which includes patients who were diagnosed with Diabetes mellitus and visit the Center of Diabetes Disease at AL-Husain Medical City. The results show the majority of sample was males, with in age group (50-59) years. And according to the adherence assessment of diabetes mellitus patient's over all domain (Foot care, Exercise, Diet, Monitoring and Medication), it indicates there is no adherence related to diabetic for self-care foot.

Rashmi P John(2017) conducted descriptive study to assess the knowledge regarding foot care among diabetic patients in the OPD’s of Ram Manohar Lohia Hospital Lucknow among 60 diabetic patients. A purposive sampling technique is used to select the samples. The tool for data collection was in the form of multiple choice questions. The findings of the questionnaire was according to the knowledge in which majority (41) 68.33% were having good knowledge and (18) 3% patients having average knowledge and only (1) 1.66% having poor knowledge.10
Mohammed T. Al Hariri et al. (2017) conducted a cross-sectional study to assess the knowledge, attitudes, practices and risk factors influencing diabetic foot ulcers among diabetes patients attending a diabetic clinic in a Saudi hospital among 229 participants from the diabetic clinic of the outpatient department. A pre-tested structured questionnaire was administered to the diabetes patients to obtain information regarding the outcome variables. The results showed that diabetic foot ulcers were observed among 26% of diabetic patients.  

B.A. Yathikumara Swamy Gowda (2017) conducted a descriptive study to assess the knowledge regarding prevention of diabetic foot ulcer among diabetic patients at selected hospitals of Moodbidri and Karkala among 60 diabetic patients were selected for the study by purposive sampling technique. The result revealed that the 40% had average knowledge, 38.4% of diabetic patients had good knowledge, 10% had very good knowledge and 11.6% had poor knowledge regarding prevention of diabetic foot ulcer, The mean knowledge scores was 11.7 and SD was 4.69. The knowledge score had statistical significant relationship with occupation. Calculated ‘p’ value is 0.01 which is less than 0.05 hence there is association between level of knowledge and occupation. 

M. Erva and A. Rebecca (2017) Conduct study to assess the knowledge and practice of diabetic foot self-care and determine the factors that affect the level and knowledge and practice of diabetic foot self-care among patients with diabetes three hundred thirty adult patients with diabetes at the outpatient clinics were given self-administered questionnaires on knowledge and practice of diabetic foot self-care. The scores were computed based on their answers. A score of >70% was gauged as good, 50 to 70% as satisfactory and <50% as poor. Of the subjects, 82.7% had good foot care knowledge, 22.4% had good foot self-care practice, and 71% had satisfactory practice score. Patients who received diabetes education were twice as likely to have a good knowledge score (OR 2.41, 95% CI, 1.09 to 5.32; p=0.03). Compared to patients who received diabetes care in private clinics, those who attended the charity outpatient clinic were nearly three times as likely to have a good knowledge score (OR 2.8, 95% CI, 1.32 to 5.96; p=0.007). Patients with known diabetes for more than ten years and those with a family history of diabetes were 50% less likely to have good practice scores (OR 0.50, 95% CI, 0.28 to 0.90; p=0.021 and OR 0.49, 95% CI, 0.29 to 0.83; p=0.008, respectively). The current state of foot care knowledge in Filipino respondents with diabetes is good but the level of foot self-care practice is only satisfactory. 

B.A. Taksande et al. (2017) Conduct study to analyze the knowledge, attitude, and practice of foot care in patients with diabetes mellitus in central rural India. This study was conducted at a rural educational hospital in central part of India over 200 patients who have Type 1 and Type 2 diabetes. They were evaluated for their knowledge about foot care and footwear practices. A structured and validated questionnaire was administered to cases. Around 82.9% of the patients were aware of the disease and
23.2% were aware of the complications of the diabetes mellitus. In 63% of the patients, foot care examination and education regarding foot complications were not suggested by their treating physicians. Annual examination of feet by the physician and self-examination were not known facts to the diabetic population. It is necessary to firstly develop awareness of diabetes mellitus and the related complications, one amongst which is foot care. Certain educational strategies should be established for both the consultant physician and also the common man to create awareness for effective foot care.

**Padma K et.al.(2016)** conducted descriptive cross sectional study to assess the level of knowledge on Foot ulcer among diabetic clients in Narayana medical college and hospital among 100 diabetic clients. Data was collected using structured questionnaire. Data analysis was done with SPSS. Results showed that with regard to foot care among 100 diabetic clients, 32 (32%) diabetic clients had inadequate knowledge, 53 (53%) had moderate knowledge and where as 15 (15%) had adequate knowledge. In this study most of the diabetic clients had inadequate and moderate knowledge regarding Diabetic foot care and adequate knowledge of low level. There was significant association between demographic variables and the level of knowledge.18

**Pinakin K. Sutariya et.al.(2016)** conducted a cross- sectional study to assess the knowledge and practice of foot care among the patients in a tertiary care centre of Ahmedabad city among 103 patients of diabetic foot. Only 24(23%) patients had good knowledge, 51 (50%) patients had satisfactory knowledge and 28(27%) had poor knowledge about diabetic foot care. Majority of the patients, i.e., 53 (51%) had poor practice, 34 (33%) had satisfactory practice and 16 (15%) had good practice. Duration of the diabetes and frequency of diabetic foot had significant statistical association with knowledge and practices of foot care. Average Knowledge and poor practice were observed among the diabetic foot patients who have attended the OPD of surgery. It indicates need of giving proper knowledge to diabetes patients by education.19

**Yahya M. Solan et.al.(2016)** conducted Observational cross-sectional study to assess the knowledge and practice of foot care among diabetes patients attending the Diabetic Center in Jazan Region, Saudi Arabia among 250 patients. Descriptive statistics and inferential statistics based on Chi-square test were used for data analysis. The prevalence of diabetic foot among males and females was 58.0% and 52.9%, respectively, without significant difference between both sexes. Eighteen percent of study population reported history of foot ulcer. Almost 53.6% patients had good foot care knowledge. Gender, duration of DM, marital status and age had no significant association with knowledge. Males were more adherent to foot drying by 65.2%, while females are applying more attention to softening of skin by 72.3%. There were no significant differences between males and females regarding foot inspection, nail care, adherence to medication and shoes check. In conclusion, the knowledge and practice of foot care among diabetic patients in our study participants were not adequate.20
B. Timethia, F. Margaret et.al.(2016) Conduct study to assess foot care knowledge and foot care practice interventions as part of diabetic foot care self-management interventions. Medline, CINAHL, CENTRAL, and Cochrane Central Register of Controlled Trials databases were searched. References from the included studies were reviewed to identify any missing studies that could be included. Only foot care knowledge and foot care practice intervention studies that focused on the person living with type 2 diabetes were included in this review. Author, study design, sample, intervention, and results were extracted. Results: Thirty studies met the inclusion criteria and were classified according to randomized controlled trial (n9), survey design (n13), cohort studies (n4), cross-sectional studies (n2), qualitative studies (n2), and case series (n1). Improving lower extremity complications associated with type 2 diabetes can be done through effective foot care interventions that include foot care knowledge and foot care practices.

Thea T. Goie and Mergan Naidoo (2016) Conduct study to assess the level of awareness of diabetic foot disease amongst patients with type 2 diabetes mellitus. An observational descriptive cross-sectional study was conducted at the chronic outpatients department of a regional hospital in Durban, South Africa. Two hundred participants with type 2 diabetes mellitus participated in the study. Ninety-one per cent of participants were either overweight or obese. Ninety-two per cent of participants had concomitant hypertension (57.5%), dyslipidaemia (26.7%) and eye disease (7.2%). Seventy-six per cent reported altered sensation in their lower limbs, and 90% reported having no previous diabetic foot disease education. Only 22.2% of participants reported having examined their feet, but only when they experienced a problem. Participants achieved mediocre scores for knowledge (mean 4.45, standard deviation (s.d.) 2.201, confidence interval (CI) 4.2–4.7) and practice (mean 11.09, s.d. 2.233, CI 10.8–11.5) on diabetic foot care. Those who had a higher level of education and who were less than 65 years old had a significantly better score for previous foot care education ($p <0.05$).

Ashok Kumar et.al.(2015) conducted a comparative study to assess the knowledge about diabetic foot care among diabetic patients (with and without foot ulcer i.e. DFU+VE and DFU-VE) attending tertiary care hospitals Lucknow in India among 200 with and without foot ulcer patients. Among with foot ulcer patients (200), 47.7% had good knowledge of foot care versus 52.3% had poor knowledge about foot care, 66.5% had good knowledge to treat hypoglycemia at home; 48.53% had good knowledge of insulin administration. In without foot ulcer patients (200), 52% had good knowledge versus 48% had poor knowledge about foot care; 64.5% had good knowledge to treat hypoglycemia at home; 36.93% had good knowledge of insulin administration. This study has highlighted the deficiency of the knowledge of foot care among the with and without foot ulcer patients, underscores the need for an educational programme to reduce the diabetic foot complication.

Chamil Visdusha Madushan Jinadasa et.al.(2015) conducted descriptive cross sectional study to assess the level of knowledge and practice of foot care among 110 patients with chronic diabetic foot ulcers
in National Hospital of Sri Lanka. Mean age was 58.4 years (SD ±8.6) and 57.3% were males. Non-healing ulcers were present among 82.7% and amputations amounted to 38.2%. The control of diabetes was poor in 60%. Regarding foot care knowledge, the mean score was 8.37, 75.5% had scored above mean and 52.7% were aware of all principles of foot care. Regarding foot care practices, the mean score was 4.55, 47.3% participants had scored below mean and 22.7% did not practice any foot care principle and hence scored 0. A statistically significant difference exists between the foot care knowledge and practice scores (p<0.001, z=-8.151). In the study sample 51% were not educated prior to occurrence of complications. Results demonstrate a satisfactory knowledge on diabetic foot disease; however their practices of preventive techniques were unsatisfactory.22

Awole Seid and Yosief Tsige (2015) Conduct study to assess knowledge, practice, and barriers of diabetic foot self-care among diabetic patients attending Felege Hiwot Referral Hospital. Institution based descriptive cross-sectional study was conducted on 313 diabetic patients using convenient sampling technique. Furthermore, descriptive statistics and binary and multivariate logistic regression were employed to assess the predictors of knowledge and practice of diabetic foot care. Majority of respondents were males (64.9%). The mean practice score was 25.2 ± 6.466 of which 53.0% had good and the remaining 47.0% had poor foot care practice out of 162 respondents having barriers, 56.8% reported “poor communication between patients and health care providers,” 50.6% cited “I did not know what to do,” and 44.4% responded “inconvenience for work” as barriers of foot care. Knowledge and practice of foot care of diabetic patients are still substandard. Poor communication between patients and nurses/physicians, lack of adequate knowledge, and inconvenience for work were commonly cited barriers of foot care.

Darshan BB et. al.(2015) The present study was designed to assess the knowledge and practice among diabetic patients in a tertiary care hospital regarding diabetic foot care. A cross-sectional study was conducted in government district hospital of Mangalore in the month of January 2014. A pre-designed semi-structured questionnaire was used to collect the information pertaining to the knowledge and practices of the diabetic patients regarding foot care. The collected data were analyzed using Statistical Packages for Social Sciences version 11.5. The results obtained were expressed in proportions. A total of 133 subjects were assessed regarding their knowledge and practice regarding diabetic foot care. Around three-fourth (75.2%) of participants had adequate knowledge. More than half (55.5%) of the subjects had adequate practice. No significant association was found between study variables such as gender, socioeconomic status, and education status with awareness regarding diabetic foot care in the present study (p>0.05).

Chavan SK et.al.(2014) Conducted cross-sectional study to assess the clinical and bacteriological profile of diabetic foot ulcer among rural Indian residents and its association with demographic factors in the rural tertiary care centre among 78 diabetic foot ulcer patients. Maximum, 70.51% cases were above the age of 50 years with higher proportion, 76.9% seen in males. The majority of cases, 97.4% were belonged to type
II Diabetes Mellitus with maximum, 48.7% cases had a duration of ulcer less than of ten days. Maximum, 67.94% ulcers were seen on Right foot, 53.8% ulcers were of grade III and above. Neuropathy, the major associated complication was seen in 68% cases and average 1.8 bacteria were identified per sample. As the grade of diabetic foot ulcer is increased, the bacterial count is also increased.\(^\text{23}\)

**Jagroop Kaur (2014)** conducted a descriptive and exploratory study to assess the knowledge and attitude of diabetics attending the medical outpatient department in hospitals of Sri Muktsar Sahib, Punjab among 100 study subjects were selected by purposive sampling technique. The results showed that 80 (80%) subjects had average level of knowledge scores and the remaining 20 (20%) possessed good level of knowledge scores related to diabetic foot and its prevention. While in attitude related to diabetic foot and its prevention, a large number i.e. 87 (87%) subjects had good, 9 (9%) showed excellent followed by 4 (4%) who depicted average level of attitude scores. It was concluded that the study subjects had deficit knowledge related to diabetic foot and its prevention as compared to the corresponding attitude that was found to be favourable.\(^\text{24}\)

**P. Tamilselvi et al. (2013)** conducted a descriptive study to assess the knowledge regarding diabetic foot ulcer among diabetic clients in a selected hospital, Kancheepuram district, Tamil Nadu among 100 diabetic patients by using Convenient sampling technique. The results mainly found that 56% patients had inadequate level of knowledge, 38% had average level of knowledge, 6% had an adequate level of knowledge. The Association between knowledge score and demographic variables was assessed by using chi-square. There was significant association between age, sex, marital status and family history of diabetes with knowledge score. The findings revealed that there is need planned teaching programme regarding diabetic ulcer foot.\(^\text{25}\)

**Hanu George et al. (2013)** conducted cross-sectional study to assess the knowledge and practices regarding foot care and to estimate the proportion of people with peripheral neuropathy among people with diabetes out-patient department of a rural secondary care hospital Mumbai among 212 consecutive diabetes patients. The Michigan Neuropathy Screening Instrument was used to identify peripheral neuropathy. About 75% had good knowledge score and 67% had good foot care practice score. Male gender (OR 2.36, 95%), poor education status (OR 2.40, 95%), and lesser duration of diabetes (OR 2.24, 95%) were significantly associated with poor knowledge on foot care. Poor knowledge was associated with poor foot care practices (OR 3.43, 95%). The prevalence of neuropathy was 47% (95%) and it was associated with longer duration of the disease (OR 2.18, 95%). There exist deficiencies in knowledge and practices regarding foot care. The prevalence of diabetic peripheral neuropathy is high.\(^\text{26}\)

**Desalu, F K Salawa et al. (2011)** The aim of this study was to determine the knowledge and practice of foot care among diabetes patients attending three tertiary hospitals in Nigeria. This is a cross-sectional study
carried out from November 2009 to April 2010. Pre-tested structured questionnaires were administered by medical officers to diabetes patients. The outcome variables were knowledge and practice regarding foot care. The knowledge and practice scores were classified as good if score ≥70%, satisfactory if score was 50–69% and poor if score was < 50%. Of 352 diabetes patients, 30.1% had good knowledge and 10.2% had good practice of diabetes mellitus foot care. Majority (78.4%) of patients with poor practice had poor knowledge of foot care. With regard to knowledge, 68.8% were unaware of the first thing to do when they found redness/bleeding between their toes and 61.4% were unaware of the importance of inspecting the inside of the footwear for objects. Poor foot practices include; 89.2% not receiving advice when they bought footwear and 88.6% failing to get appropriate size footwear.

CHAPTER - III

METHODOLOGY

Methodology is the framework for conducting a study. It indicates the general pattern for organizing the procedure to gather valid and reliable data for an investigation. This chapter discusses the methodology used for descriptive study.

3.1 RESEARCH DESIGN

The design of the study was Descriptive.

3.2 RESEARCH SETTING

According to POLIT and BECK (2008), Setting is the physical location and condition in which the data collections take place in the study. The selection of the appropriate setup is very important because the setup can influence the way people behave and feel, and how they respond.

The study was conducted in out-patient departments of Rajindra hospitals of district Patiala, Punjab.

3.3 TARGET POPULATION
The target population for study was patients with diabetes mellitus attending out-patient departments in Rajindra hospitals of district Patiala, Punjab.

3.4 SAMPLE AND SAMPLING TECHNIQUE

- Sample is 100 patients with Diabetes mellitus attending out-patient departments in Rajindra hospitals of district Patiala, Punjab and Purposive sampling technique will be used for the study.

3.5 VARIABLES

**Study variable includes:** knowledge of patients with diabetes mellitus regarding care of diabetic foot.

**Extraneous variable includes:** age, education, occupation, religion, Marital Status, Type of work, Monthly income, Family history of diabetes mellitus, awareness about diabetic foot care and source of information.

3.6 SAMPLING CRITERIA

**Inclusion criteria**

The study is includes the diabetes mellitus patients

- Attending out-patient departments in Rajindra hospitals of district Patiala, Punjab.
- Available during period of study.
- Willing to participate in the study.

**Exclusion criteria**

The study excludes:

- Patients with diabetes mellitus who are not willing to participate in the study.
- Patients with diabetes mellitus who are not available during period of study.

3.6 SELECTION AND DEVELOPMENT OF TOOL

The instrument selected in research must be a vehicle that obtains best data for drawing conclusion, which is pertinent to the study. Tool is the device that researcher used to collect the data. The tool acts as a best instrument to assess and collect that data from the subjects of the study. In the present study, self structured knowledge questionnaire were selected based on the objectives of the study as it was considered the most best and appropriate instrument to elicit the response from subjects. After extensive and systematic review
of literature and discussion with the experts, 35 items for structured knowledge questionnaire were selected. The main strength behind developing the tool was:

- Related review of literature.
- Based on opinions and suggestions of experts.
- Book, journal and internet etc.

All of the above provided relevant data necessary to construct the tool to assess the knowledge regarding care of diabetic foot among patients with diabetes mellitus. A blueprint was prepared prior to the construction of questionnaire. Details of blueprint are shown in Table No.1

<table>
<thead>
<tr>
<th>Area</th>
<th>Knowledge</th>
<th>Comprehension</th>
<th>Application</th>
<th>Total Items</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Item</td>
<td>Item</td>
<td>Item</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Introduction</td>
<td>2,3,4,5,</td>
<td>6,7,8</td>
<td>-</td>
<td>9</td>
<td>25.71%</td>
</tr>
<tr>
<td></td>
<td>9,10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Definition</td>
<td>1,11,12,13</td>
<td>6</td>
<td>-</td>
<td>6</td>
<td>17.14%</td>
</tr>
<tr>
<td></td>
<td>14,15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Care of diabetic</td>
<td>16,17,18,</td>
<td>27,30,33,34,35</td>
<td>19,20,21,22,23,24,25,26,28,29,31,32</td>
<td>12</td>
<td>57.14%</td>
</tr>
<tr>
<td>foot</td>
<td>3</td>
<td>5</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>8</td>
<td>35</td>
<td></td>
<td>100%</td>
</tr>
</tbody>
</table>

**TABLE 1:- BLUEPRINT OF SELF-STRUCTURED KNOWLEDGE QUESTIONNAIRE**

**3.7 DESCRIPTION OF TOOL**

Self-structured knowledge questionnaire was used to assess the knowledge regarding care of diabetic foot among patients with Diabetes mellitus. Questionnaire was consists of two sections:

**Section A:** Socio- demographic variables consists 13 items collected by structured questionnaire on sample characteristic.
Section B: Self structured questionnaire regarding care of diabetic foot among patients with diabetes mellitus attending out-patient departments consisting of 35 items. Every correct answer was accorded a score of one (1) and incorrect/unanswered question was accorded zero (0). The maximum score on knowledge questionnaire was thirty five (35). The range for assessment of knowledge is categorized as follows:

<table>
<thead>
<tr>
<th>LEVEL OF KNOWLEDGE</th>
<th>SCORE RANGE</th>
<th>%age</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADEQUATE KNOWLEDGE</td>
<td>25 - 35</td>
<td>25%-35%</td>
</tr>
<tr>
<td>MODERATE KNOWLEDGE</td>
<td>13 – 24</td>
<td>13%-24%</td>
</tr>
<tr>
<td>INADEQUATE KNOWLEDGE</td>
<td>0 - 12</td>
<td>0% – 12%</td>
</tr>
</tbody>
</table>

N=100

3.8 VALIDITY OF TOOL(S)

- The content validity of self-structured knowledge questionnaire was done by expert opinion or relevance of items.
- The tool was given to the experts of Medical surgical nursing, as per their suggestions, needed amendments will be done.

3.9 RELIABILITY OF TOOL(S)

Reliability of the research, is defined as the extent to which the instrument yields the same results on respected measures. It is then concerned with consistency, accuracy, precision, stability, equivalence and homogeneity. The final tool was tested for reliability. Reliability of the structured knowledge questionnaire carried out on 10 subjects. The tool was found to be clear and understandable. By using Karl Pearson’s Correlation Coefficient formula (split-half method) which measures the co-efficient of internal consistency.

- The reliability obtained was \( r=0.79 \) indicating the tool is reliable.
- Hence, the tool was found to be internally consistent and reliable for the study.

3.10 PILOT STUDY

For the present study, investigator selected “Rajindra hospital of district Patiala, Punjab” for pilot study. It was conducted in the month of February 2020. The investigator selected 10% i.e, (10 patients with diabetes mellitus) of the actual sample by using purposive sampling technique with the similar characteristics of
main study sample. Informed consent was obtained from each respondents and confidentiality was assured by investigator.

Time taken to answer the questions of self structured knowledge questionnaire was 15-20 minutes. The analysis of the pilot study found the feasibility to conduct the main study and also revealed that objectives of study could be fulfilled. Based on the information, the investigator proceeded with the actual data collection for the main study. The pilot study subjects were excluded from the main study.

3.11 DATA COLLECTION PROCEDURE

- A prior formal permission was obtained from the concerned from the concerned authority.
- The purpose of the study was explained and consent will be obtained from the subjects.
- The investigator was select samples as per inclusion criteria. Knowledge regarding care of diabetic foot among patients will be evaluated by self-structured knowledge questionnaire.
- After collecting the data informational booklet is administered to the eligible couples to enhance their knowledge about care of diabetic foot.

3.12 ETHICAL CONSIDERATIONS

- Prior to the study, ethical clearance was obtained from the concerned authorities to conduct the study in selected hospitals of district Patiala, Punjab and also from research committee of Adarsh College of Nursing, Patiala.
- Anonymity and confidentiality of the study participants was maintained.
- Informed consent was obtained from eligible couples who were willing to participate in the study.

3.13 PLAN OF DATA ANALYSIS

After coding the collected data, it will be transferred to master sheet. Then descriptive and inferential statistics was used to analyze the data. The data will be presented in the form of tables and figures.

- **Descriptive statistics:** Frequency and percentage distribution was used to analyze the demographic profile of patients with Diabetes mellitus.
- **Inferential statistics:** Chi-square test\((X^2)\) was used to find out association between knowledge scores and selected socio-demographic variables.

Summary
This chapter dealt with the research approach, research design, setting of the study, variables under the study, population, sample and sampling technique, criteria for sample selection, selection and development of tool, description of the tool, content validity of the tool, reliability of the tool, pilot study, data collection procedure, and plan for data analysis.

**Research Design**

Non-Experimental Descriptive Research Design

**Research Setting**

Out-Patient Departments in Selected Hospitals of

**Target Population**

Patients with Diabetes Mellitus Attending Out-Patient Departments in Selected Hospital of District Patiala, Punjab

**Sample Size**

100 Patients with Diabetes Mellitus Who Will Attend Out-Patient Departments

**Sample Technique**

Purposive Sampling

**Variables**

Study variables includes: knowledge of patients with diabetes mellitus regarding care of diabetic foot

Extraneous variable includes: age, sex, religion, education, marital status, occupation, type of work, monthly income, family history, duration, awareness, source of information

**Data Collection Procedure**

Administer Self Structure Knowledge Questionnaire
CHAPTER IV

ANALYSIS AND INTERPRETATION OF THE DATA

This chapter deals with the analysis and interpretation of result of data collected from 100 diabetes mellitus patients attending out-patient departments in selected hospital of district Patiala, Punjab. The data was tabulated analyzed and interpreted using pre-experimental and effectiveness of self instructional module based on the objective formulated for the present study.
The collected data was tabulated, organized, analysis and interpreted by using descriptive and inferential statistics based on the objectives of the study and the hypothesis to be tested. All data was also summarized in the master data sheet.

**OBJECTIVES OF THE STUDY**

- To assess the knowledge regarding care of diabetic foot among patients with Diabetes Mellitus, attending out-patient departments in selected hospitals of district Patiala, Punjab.
- To find out the association between knowledge score regarding care of diabetic foot among patients with Diabetes Mellitus, attending out-patient departments in selected hospitals of district Patiala, Punjab.
- To distribute an informational booklet regarding care of diabetic foot among patients with Diabetes Mellitus, attending out-patient departments in selected hospitals of district Patiala, Punjab.

**PLAN OF ANALYSED DATA**

Analysis and interpretation of data was done according to the objectives and by using descriptive and inferential statistics. The level of significance at $p<0.05$

**ORANIZATION OF DATA FOR ANALYSIS**

The analyzed data was organized according to the objectives and presented under the following sections.

**Section A:** Frequency and percentage distribution of diabetes mellitus patients according to their selected socio-demographic variables.

**Section B:** Findings related to knowledge score regarding care of diabetic foot among diabetes mellitus patients in selected hospital Patiala, Punjab.

**Section C:** To find out the association between knowledge regarding care of diabetic foot among diabetes mellitus patients with selected socio demographic variables.

**SECTION A**

**DEMOGRAPHICAL VARIABLES**

<table>
<thead>
<tr>
<th>Socio-demographic Variables</th>
<th>Options</th>
<th>Percentage(%)</th>
<th>Frequency(f)</th>
</tr>
</thead>
<tbody>
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<td>Age ( in year)</td>
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<td>2</td>
</tr>
<tr>
<td></td>
<td>31-40</td>
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</tr>
<tr>
<td></td>
<td>41-50</td>
<td>60%</td>
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<tr>
<td>--------------------------</td>
<td>-------</td>
<td>------</td>
<td>-------</td>
</tr>
<tr>
<td></td>
<td>51-60</td>
<td>13%</td>
<td>13</td>
</tr>
<tr>
<td>Sex</td>
<td>Male</td>
<td>43%</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>57%</td>
<td>57</td>
</tr>
<tr>
<td>Religion</td>
<td>Hindu</td>
<td>40%</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Christian</td>
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<td>3</td>
</tr>
<tr>
<td></td>
<td>Muslim</td>
<td>7%</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Other</td>
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<td>50</td>
</tr>
<tr>
<td>Education</td>
<td>Illiterate</td>
<td>39%</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Primary Education</td>
<td>37%</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Secondary Education</td>
<td>19%</td>
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</tr>
<tr>
<td></td>
<td>Graduate</td>
<td>5%</td>
<td>5</td>
</tr>
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<td>71</td>
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<tr>
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<td>17%</td>
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<td></td>
<td>Divorced</td>
<td>2%</td>
<td>2</td>
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<tr>
<td>Occupation</td>
<td>Unemployed</td>
<td>49%</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>Self employed</td>
<td>41%</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Private Employee</td>
<td>4%</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Government Employee</td>
<td>6%</td>
<td>6</td>
</tr>
<tr>
<td>Type of work</td>
<td>Sedentary</td>
<td>6%</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>60%</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Heavy</td>
<td>34%</td>
<td>34</td>
</tr>
<tr>
<td>Monthly Income in Rupees</td>
<td>Below 8000</td>
<td>42%</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>8000-15000</td>
<td>55%</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>15000-20000</td>
<td>2%</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Above 25000</td>
<td>1%</td>
<td>1</td>
</tr>
<tr>
<td>Family History of Diabetes Mellitus</td>
<td>Yes</td>
<td>43%</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>57%</td>
<td>57</td>
</tr>
<tr>
<td>Relation to the parent</td>
<td>Parental</td>
<td>40%</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Maternal</td>
<td>59%</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>Grand parents</td>
<td>1%</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>When was Diabetes Mellitus Identified</td>
<td>Less than 6month</td>
<td>19%</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>6month-1year</td>
<td>45%</td>
<td>45</td>
</tr>
</tbody>
</table>
Table 1: Frequency & percentage distribution of subject as per their socio demographic characteristics

<table>
<thead>
<tr>
<th>Source of Information</th>
<th>1year-5years</th>
<th>31%</th>
<th>31</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above 5years</td>
<td>5%</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Do have awareness about Diabetic foot care</td>
<td>Yes</td>
<td>48%</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>52%</td>
<td>52</td>
</tr>
<tr>
<td>Personal experience</td>
<td>1%</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>TV/Radio</td>
<td>60%</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Magazines/Books</td>
<td>36%</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>Awareness programmes</td>
<td>3%</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Table 1 data reveals that out of 100 subjects, 2% were of the age group 21-30 years, 25% in 31-40 years, 60% in 41-50 years. Majorities of the respondent i.e. 57% female and 43% were male. Majorities of the subjects i.e. 50% belongs to others and 40% belongs to hindu, 7% mulism, 3% christiaan religion. 39% were illiterate, 37% have primary education, 5% graduate. Majorities of the subjects were 71% married, 10% single, 17% widow, 2% divorced. Majorities of the subjects 49% were unemployed, 41% were self employed, 4% were private employed, 6% were government employee. Majorities of subjects 60% moderate work, 34% have heavy work, 6% were sedentary work. Among them majorities of the subjects 55% belongs to the family income 8000-15000/-, 42% below 8000, 2% 15000-20000/-, 1% have family income above 25000/- per month. 57% have not family history of diabetes mellitus and 43% have family history of diabetes mellitus. Majorities of the subjects were 59% maternal relation to the parent, 40% were parental, 1% were grand parents and 0% were others. Majorities of the subjects 45% were identified diabetes mellitus within 6 month-1year, 31% were identified in 1year-5years, 5% were identified in above 5 years. 52% have no awareness about diabetic foot care, 48% were aware about diabetic foot care. Majorities of subjects 60% have source of information radio and T.V, 36% have source of information Magazines and books, 3% attend awareness programmes, 1% have personal experience.

Hence it can be concluded that 60% patients were from age 41-50 years, 57% were female, 50% were from other religion, 71% were married, 49% were unemployed, 60% have moderate work, 55% belongs to the family income 8000-15000/- per month, 57% have no family history of diabetes mellitus, 59% were maternal relationship, 45% were identified diabetes mellitus within 6 month-1year, 52% were not aware about diabetic foot care, 60% have source of information radio and t.v.
Figure 3.1 Percentage distribution of patients according to their ages
Figure 3.2 Percentage distribution of patients according to their Sex

Demographic Variables

Sex

Male  Female

Percentage

0.0  0.1  0.2  0.3  0.4  0.5  0.6

43%  57%

Figure 3.2 Percentage distribution of patients according to their Sex
Figure 3.3 Percentage distribution of patients according to their Religion

- Hindu: 40%
- Christian: 3%
- Muslim: 7%
- Other: 50%
Figure 3.4 Percentage distribution of patients according to their Education

- Illiterate: 39%
- Primary Education: 37%
- Secondary Education: 19%
- Graduate: 5%
Figure 3.5 Percentage distribution of patients according to their Marital Status
Figure 3.6 Percentage distribution of patients according to their occupation
Figure 3.7 Percentage distribution of patients according to their type of work
Figure 3.8 Percentage distribution of patients according to their family income
Figure 3.9 Percentage distribution of patients according to their relationship

Demographic Variables

<table>
<thead>
<tr>
<th>Family History of Diabetes Mellitus</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>43%</td>
</tr>
<tr>
<td>No</td>
<td>57%</td>
</tr>
</tbody>
</table>
Figure 3.10 Percentage distribution of patients according to their relationship if have
Figure 3.11 Percentage distribution of patients according to their diabetes mellitus identification
Figure 3.12 Percentage distribution of patients according to having awareness about Diabetic foot care.

Source of Information:
- Personal experience: 2%
- TV/Radio: 60%
- Magazines/Books: 36%
- Awareness programmes: 3%
SECTION –B

OBJECTIVE – 1

To assess the knowledge score regarding care of diabetic foot among patients with Diabetes Mellitus, attending out-patient departments in selected hospitals of district Patiala, Punjab.

<table>
<thead>
<tr>
<th>CRITERIA MEASURE OF KNOWLEDGE SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level of Scores</strong></td>
</tr>
<tr>
<td>Adequate Knowledge.(25-35)</td>
</tr>
<tr>
<td>Moderate Knowledge.(13-24)</td>
</tr>
<tr>
<td>Inadequate Knowledge.(0-12)</td>
</tr>
</tbody>
</table>

Maximum =35 Minimum=0

Table 2.1 Showing Level of knowledge Scores of patients regarding care of diabetic foot in hospitals
Figure 4.1: Diagram showing Level of Scores among diabetes mellitus patients

Table 2.1 and Figure no: 4.1 depicts the knowledge score regarding care of diabetic foot among patients of diabetes mellitus. It shows that majority of patients i.e. 71(71%) had moderate level of knowledge, whereas 29 (29%) patients had inadequate knowledge and none of the patients had adequate knowledge.

Hence, it is concluded that the majority of patients have moderate level of knowledge regarding care of diabetic foot.
Table 2.2: Descriptive Statistics table

<table>
<thead>
<tr>
<th>Descriptive Statistics</th>
<th>Mean</th>
<th>Median</th>
<th>S.D.</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Range</th>
<th>Mean %</th>
</tr>
</thead>
<tbody>
<tr>
<td>KNOWLEDGE Score</td>
<td>14.79</td>
<td>15</td>
<td>3.22</td>
<td>22</td>
<td>10</td>
<td>12</td>
<td>42.26%</td>
</tr>
</tbody>
</table>

Maximum=35 Minimum=0

Table 2.2, Figure 4.3 shows that knowledge mean score of the patients regarding care of diabetic foot was 14.79 and mean percentage knowledge of patients was 42.26%. Thus it can be said that knowledge of regarding care of diabetic foot is moderate among patients with diabetes mellitus.
Figure 4.2 Line diagram showing Individual Scores among diabetes mellitus patients
Figure 4.5 Diagram Showing Mean, Median and SD Score among diabetes mellitus patients
OBJECTIVE -II

To find out the association between knowledge score regarding care of diabetic foot among patients with Diabetes Mellitus, attending out-patient departments in selected hospitals with their socio – demographic variables.
Table 3: Table Showing Association of Scores and Demographic Variables

This section deals with the findings related to the association between score and their selected demographic variables. The chi-square test was used to determine the association between the score levels and their selected demographic variables.

<table>
<thead>
<tr>
<th>Demographic Data</th>
<th>Levels (N=100)</th>
<th>Association with KNOWLEDGE Score</th>
<th>Chi Test</th>
<th>P Value</th>
<th>df</th>
<th>Table Value(x^2)</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
<td>Options</td>
<td>ADEQUATE</td>
<td>MODERATE</td>
<td>INADEQUATE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (in year)</td>
<td>21-30</td>
<td>2</td>
<td>0</td>
<td></td>
<td>3.250</td>
<td>0.355</td>
<td>Not Significant</td>
</tr>
<tr>
<td></td>
<td>31-40</td>
<td>17</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>41-50</td>
<td>45</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>51-60</td>
<td>7</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>Male</td>
<td>34</td>
<td>9</td>
<td></td>
<td>2.386</td>
<td>0.122</td>
<td>Not Significant</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>37</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Religion</td>
<td>Hindu</td>
<td>31</td>
<td>9</td>
<td></td>
<td>6.993</td>
<td>0.072</td>
<td>Not Significant</td>
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<tr>
<td></td>
<td>Christian</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Muslim</td>
<td>2</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>36</td>
<td>14</td>
<td></td>
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<tr>
<td>Education</td>
<td>Illiterate</td>
<td>31</td>
<td>8</td>
<td></td>
<td>2.805</td>
<td>0.423</td>
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</tr>
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<td></td>
<td>Primary Education</td>
<td>24</td>
<td>13</td>
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</tr>
<tr>
<td></td>
<td>Secondary Education</td>
<td>12</td>
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<td></td>
<td>Graduate</td>
<td>4</td>
<td>1</td>
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<td>Marital Status</td>
<td>Single</td>
<td>7</td>
<td>3</td>
<td></td>
<td>3.973</td>
<td>0.264</td>
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<tr>
<td></td>
<td>Married</td>
<td>53</td>
<td>18</td>
<td></td>
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<tr>
<td></td>
<td>Widow</td>
<td>9</td>
<td>8</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Divorced</td>
<td>2</td>
<td>0</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td>Unemployed</td>
<td>34</td>
<td>15</td>
<td></td>
<td>5.039</td>
<td>0.169</td>
<td>Not Significant</td>
</tr>
<tr>
<td></td>
<td>Self employed</td>
<td>31</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Private Employee</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Government Employee</td>
<td>Sedentary</td>
<td>Moderate</td>
<td>Heavy</td>
<td>Monthly Income in Rupees</td>
<td>Below 8000</td>
<td>8000-15000</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------------</td>
<td>-----------</td>
<td>----------</td>
<td>-------</td>
<td>--------------------------</td>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td>Type of work</td>
<td>5</td>
<td>1</td>
<td>1.485</td>
<td>0.476</td>
<td>5.99</td>
<td>Not Significant</td>
<td></td>
</tr>
<tr>
<td>Monthly Income in Rupees</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>9</td>
<td>3.843</td>
<td>0.279</td>
<td>7.81</td>
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</tr>
<tr>
<td>Family History of Diabetes Mellitus</td>
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<td>33</td>
<td></td>
<td></td>
<td></td>
<td>Not Significant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>38</td>
<td>1.209</td>
<td>0.272</td>
<td>3.84</td>
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</tr>
<tr>
<td>Relation to the parent</td>
<td>Parental</td>
<td>32</td>
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<td>Not Significant</td>
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<tr>
<td></td>
<td>Maternal</td>
<td>38</td>
<td></td>
<td></td>
<td></td>
<td>Not Significant</td>
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</tr>
<tr>
<td></td>
<td>Grand parents</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>Not Significant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>Not Significant</td>
<td></td>
</tr>
<tr>
<td>When was Diabetes Mellitus Identified</td>
<td>Less than 6month</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td>Not Significant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6month-1year</td>
<td>32</td>
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<td></td>
<td></td>
<td>Not Significant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1year-5years</td>
<td>23</td>
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<td></td>
<td></td>
<td>Not Significant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Above 5years</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>Not Significant</td>
<td></td>
</tr>
<tr>
<td>Do have awareness about Diabetic foot care</td>
<td>Yes</td>
<td>36</td>
<td></td>
<td></td>
<td></td>
<td>Not Significant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
<td>Not Significant</td>
<td></td>
</tr>
<tr>
<td>Source of Information</td>
<td>Personal experience</td>
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<td></td>
<td></td>
<td></td>
<td>Not Significant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TV/Radio</td>
<td>39</td>
<td></td>
<td></td>
<td></td>
<td>Not Significant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Magazines/Books</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td>Not Significant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Awareness programmes</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>Not Significant</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 depicts their association between the knowledge score of patients with diabetes mellitus regarding care of diabetic foot with their socio demographic variables.
It was obtained, the chi-square value for age ($\chi^2=7.815, p=0.355^{NS}$), education ($\chi^2=7.815, p=0.423^{NS}$), sex ($\chi^2=3.841, p=0.122^{NS}$), marital status ($\chi^2=7.815, p=0.264^{NS}$), occupation ($\chi^2=7.815, p=0.169^{NS}$), type of work ($\chi^2=5.991, p=0.476^{NS}$), monthly income ($\chi^2=7.815, p=0.279$), family history ($\chi^2=3.841, p=0.272^{NS}$), identification of diabetes mellitus ($\chi^2=7.815, p=0.286^{NS}$), more than table value, which indicates that there was non significant association between the knowledge score of patients with diabetes mellitus with their demographic variables.

Hence, it reveals that each demographic variable has $p>0.05$ which suggest statistically non significant association of knowledge score among patients with diabetes mellitus with their socio-demographic variables.

Table shows that the association between the level of score and socio demographic variable. Based on the objectives used to Chi-square test used to associate the level of knowledge and their selected demographic variables. There is no significance association between the level of scores and other demographic variables. The calculated chi-square values were less than the table value at the 0.05 level of significance.

**SUMMARY OF THE MAJOR FINDING**

- Most of the patients (60%) belongs to the age group 41-50 years.
- Majorities of the patients (57%) were females.
- Most of the patients (50%) were others religion.
- Majorities of the patients (71%) were married.
- Most of the patients (49%) were unemployed.
- Most of patients (60%) have moderate work.
- Majorities of patients (55%) belongs to the family who’s monthly income refers 8000-15000/-
- Most of the patients (57%) have no history of diabetes mellitus in family.
- Most of patients (59%) have maternal relationship.
- Maximum patients (45%) identified diabetes mellitus with in 6month- 1year.
- Most of patients (52%) were not aware about care of diabetic foot care.
- Maximum patients (60%) have source of information radio & television.
- Majority of patients (71%) have moderate level of knowledge regarding care of diabetic foot care.
- Mean percentage knowledge of patients (42.26%) was moderate.
- No significant association was found in age, sex, religion, education, martial status, occupation, type of work, monthly income, family history, relationship, identification of the diabetes mellitus, source of information of the subjects and their demographic variables.
CHAPTER V

DISCUSSION

This chapter relates the results of the finding of the present study with the findings of the studies conducted in the past. The present study findings have been discussed in accordance with the objectives of the study.

The first objective of the study was to assess the knowledge regarding care of diabetic foot among the patients with diabetes mellitus revealed that majority (71%) patients have moderate knowledge regarding care of diabetic foot. A similar study was conducted by F. Tehseen, M. Zahid et. al. (2019) to evaluate the knowledge and practices regarding foot care in diabetic patients presenting with foot ulcers in a tertiary care hospital of Karachi, Pakistan. Patients who scored >70% had good knowledge and practices of foot care, those between 50% and 70% had average and those who scored <50% had poor knowledge and practices of foot care knowledge and practices of foot care were found to be unsatisfactory in most of the patients.

Also another study conducted by Padma K et. al. (2016) to assess the level of knowledge on Foot ulcer among diabetic clients in Narayana medical college and hospital among 100 diabetic clients. Data was collected using structured questionnaire. Data analysis was done with SPSS. Results showed that with regard to foot care among 100 diabetic clients, 32 (32%) diabetic clients had inadequate knowledge, 53 (53%) had moderate knowledge and where as 15 (15%) had adequate knowledge. In this study most of the diabetic clients had inadequate and moderate knowledge regarding Diabetic foot care and adequate knowledge of low level.

The second objective of the study to find out the association between knowledge score among patients with diabetes mellitus and their selected socio-demographic variables. Result of the present study reveals that there is no significant association found between knowledge score of the subjects and their selected socio-demographic variables. These finding were supported with the previous study of Yahya M. Solan et. al. (2016) to assess the knowledge and practice of foot care among diabetes patients attending the Diabetic Center in Jazan Region, Saudi Arabia among 250 patients. Descriptive statistics and inferential statistics based on Chi-square test were used for data analysis. The prevalence of diabetic foot among males and females was 58.0% and 52.9%, respectively, without significant difference between both sexes.
Eighteen percent of study population reported history of foot ulcer. Almost 53.6% patients had good foot care knowledge. Gender, duration of DM, marital status and age had no significant association with knowledge. Males were more adherent to foot drying by 65.2%, while females are applying more attention to softening of skin by 72.3%. There were no significant differences between males and females regarding foot inspection, nail care, adherence to medication and shoes check. In conclusion, the knowledge and practice of foot care among diabetic patients in our study participants were not adequate.20

CHAPTER-VI

SUMMARY, CONCLUSION AND RECOMMENDATIONS

The chapter entails a summary of the major findings with conclusion, limitations and implications for nursing practice, education, nursing administration and nursing research. It also gives an account of suggestion and recommendations for future research in the field of medical surgical nursing.

PROBLEM STATEMENT
A Descriptive study to assess the knowledge regarding care of diabetic foot among patients with Diabetes Mellitus, attending out-patient departments in selected hospitals of district Patiala, Punjab with a view to develop an informational booklet.

AIM OF THE STUDY

The aim of study to assess the knowledge regarding care of diabetic foot among patients with Diabetes Mellitus, attending out-patient departments in selected hospitals of district Patiala, Punjab.

SUMMARY

The present study was conducted on 100 patients with diabetes mellitus to assess the knowledge regarding care of diabetic foot among patients with diabetes mellitus, attending out-patient departments in selected hospitals of district Patiala, Punjab. The study was undertaken with the following objectives:

- To assess the knowledge regarding care of diabetic foot among patients with Diabetes Mellitus, attending out-patient departments in selected hospitals of district Patiala, Punjab.
- To find out the association between knowledge score regarding care of diabetic foot among patients with Diabetes Mellitus, attending out-patient departments in selected hospitals of district Patiala, Punjab.
- To distribute an informational booklet regarding care of diabetic foot among patients with Diabetes Mellitus, attending out-patient departments in selected hospitals of district Patiala, Punjab.

The final study was conducted in selected hospitals of Patiala ( ). A conceptual framework adopted for the study was based on king theory of goal attainment. Review of literature and related studies helped the investigator to collect appropriate and relevant interventions to support research design, conceptual framework, development of the tool, informational booklet and analysis of data.

Purposive sampling technique was used to collect data. The sample comprised of 100 patients with diabetes mellitus, attending out-patient departments in selected hospitals of Patiala. To obtain necessary data for the study, structured questionnaire was developed. It consisted of two sections:

- **Section A**: It consisted of age (in years), education, sex, religion, marital status, occupation, type of work, monthly income, family history, awareness about diabetic foot care, source of information.
- **Section B**: It consisted of self structured questionnaire to assess the knowledge regarding care of diabetic foot.

The content validity of tool was established by nursing experts of different nursing colleges, Punjab. Pilot study was conducted on 10% of target population. Prior to commencing the task of data collection, written permission was taken from Principal of Adarsh College of Nursing Patiala, Punjab and formal permission was obtained from hospital Patiala, Punjab. It was done to identify the
reliability of the tool and feasibility of the study. Reliability of tool was obtained by using test-retest method using Karl Pearson’s coefficient Correlation formula. The reliability of the tool was $r = 0.734$. Hence, the tool was reliable.

The collected data was coded and interpreted according to the objectives of the study and analyzed by using descriptive and inferential statistics. Tables and bar graphs were used to depict the findings.

**MAJOR FINDING**

- Most of the patients (60%) belongs to the age group 41-50 years.
- Majorities of the patients (57%) were females.
- Most of the patients (50%) were others religion.
- Majorities of the patients (71%) were married.
- Most of the patients (49%) were unemployed.
- Most of patients (60%) have moderate work.
- Majorities of patients (55%) belongs to the family who’s monthly income refers 8000-15000/.
- Most of the patients (57%) have no history of diabetes mellitus in family.
- Most of patients (59%) have maternal relationship.
- Maximum patients (45%) identified diabetes mellitus with in 6month- 1year.
- Most of patients (52%) were not aware about care of diabetic foot care.
- Maximum patients (60%) have source of information radio & television.
- Majority of patients (71%) have moderate level of knowledge regarding care of diabetic foot care.
- Mean percentage knowledge of patients (42.26%) was moderate.
- It was obtained, the chi-square value for age ($\chi^2=7.815, p=0.355^{NS}$), education ($\chi^2=7.815, p=0.423^{NS}$), sex ($\chi^2=3.841, p=0.122^{NS}$), marital status ($\chi^2=7.815, p=0.264^{NS}$), occupation ($\chi^2=7.815, p=0.169^{NS}$), type of work ($\chi^2=5.991, p=0.476^{NS}$), monthly income ($\chi^2=7.815, p=0.279$), family history ($\chi^2=3.841, p=0.272^{NS}$), identification of diabetes mellitus ($\chi^2=7.815, p=0.286^{NS}$).
- No significant association was found in age, sex, religion, education, martial status, occupation, type of work, monthly income, family history, relationship, identification of the diabetes mellitus, source of information of the subjects and their demographic variables.

**CONCLUSION**

From the findings of the present study it was concluded that the knowledge score regarding care of diabetic foot among patients of diabetes mellitus. It shows that majority of patients i.e. 71(71%) had moderate level of knowledge, where as 29 (29%) patients had inadequate knowledge and none of the patients had adequate knowledge.
Hence, it is concluded that the majority of patients have moderate level of knowledge regarding care diabetic foot.

**IMPLICATIONS**

The findings of the study have several implications which are discussed in three areas:

- Nursing education
- Nursing practice
- Nursing administration
- Nursing research

**Nursing Education**

Education is the key for development of excellent nursing practices. The education of the patient and his/her environment plays an instrumental role in the prevention of the diabetic foot syndrome. Many diabetic patients may not know or may not be in a position to understand the importance of proper care of their feet. The first step for the nurse is therefore to assess the patient’s self-care capacity and establish communication that will help with the next steps. This can be achieved either with the patient himself or members of his immediate environment, if the patient is in need of assistance and cannot perform the tasks alone either due to complications of the disease, e.g. poor eyesight, or due to other factors, e.g. age, chronic diseases.

**Nursing Practice**

Nursing practice is an act of providing care to the patients. This study reflects that nurses generally possess an inadequate level of knowledge pertaining to ulcer care despite a positive attitude. Formal wound care training and work experiences demonstrated a significant correlation with knowledge. A comprehensive educational program focusing on evidence-based practice is necessary to ensure positive attitudes and better clinical practices. Evidence-based clinical practice relies heavily on research. Nurses should be made aware of the importance of research in their clinical practice and be provided with opportunities to partake in research activities.

**Nursing Administration**

Nursing administration play a pivotal role in supervision and management of nursing profession. Nurse administrator should anticipate the need and take responsibility to motivate patients with diabetes mellitus to improve their knowledge regarding care diabetic foot. In particular, the training in diabetic foot management given to nurses can be organized as a separate training program instead of being given in general diabetes education programs. The demonstration method together with oral presentation can be
used during the training on foot examination, and the information, attitudes, and behaviors of nurses can be evaluated after the training. In this way, the missing or misunderstood information can be corrected. Thus, nurses active participation in diabetic foot care and foot examinations can be achieved by increasing their awareness of foot problems and formation of diabetic foot ulcers. In addition, undergraduate and postgraduate nursing education curricula for training expert nurses in diabetic foot area can be strengthened with respect to this topic, and practices for foot examinations may be included as a part of general clinical education. Thus, providing patients with education and care by specialized nurses trained in the field of the diabetic foot rather than general nurses may be more effective in preventing diabetic foot problems and reducing amputation. Therefore, the need to acquire sufficient knowledge of foot care can be satisfied and nurses would have the ability to update their knowledge of evidenced-based foot care applications.

- **Nursing Research**

The findings of the study serve as the professional and nursing students to conduct further studies. The survey form that was used in this study was prepared based on the researcher’s previous experience and information from previous studies. In addition, it attempted to address all the factors that affect the development of diabetic foot after an extensive review of the literature scanning. The form not only includes practices about diabetic foot care, but also statements regarding factors that play a key role in diabetic foot development, choice of suitable shoes, and foot examination. Moreover, in the process of designing the items, a great deal of attention was paid for the items not to have more than one statement or opinion and to be clear and understandable. Experts were consulted to assess the measurement tool and to obtain a more reliable and understandable form. The scale had high reliability too. This survey is thought to be helpful for future studies to be carried out on this subject.

**Recommendation for future research studies**

Based on the conclusions made the investigators forwarded the following recommendations.

- This study is suggestive of alarmingly increasing Diabetes Mellitus prevalence in rural areas. Therefore, instead of focusing only on infectious diseases, it is an indication that policy makers should give due attention to control the spread of Diabetes Mellitus in the study area.

- In order to emphasize foot care education, again policy makers should start a program of developing professional diabetic educators and maybe podiatrists (foot and ankle surgeon) to contribute in the efforts made to control the disease and minimize complications.

- The hospital administration should establish a specialized Diabetes Mellitus clinic so that follow-up and education services can be well integrated.
- Taking consideration of patients’ age, educational status, occupational status, duration of diabetic therapy, and other factors is essential while considering individualized foot care education.

- Moreover, since the risk outweighs the benefit of barefoot working, patients should search for alternative convenient shoes rather than ignoring this during work.

**Limitations**

The private hospital where this study was conducted is a group hospital. This study was carried out in a total of 3 hospitals, one of which is an application and research hospital affiliated to a foundation university. Therefore, the results of this study can be generalized only to patients who attend out-patient departments in private hospitals in Patiala, Punjab. We suggest that future studies use larger sample groups with different characteristics, such as state hospitals and education-research hospitals. In addition, the knowledge level form does not include all of the knowledge related to diabetic foot care. In this study, information on neurological and vascular evaluation regarding diabetic foot examination is not comprehensive. The questionnaires observed to have unanswered questions during data entry were not included in the study.

**Summary**

This chapter deals with summary, limitations, conclusions, implications and recommendation based on the study.

**REFERENCES**


ANNEXURE - V

LETTER SEEKING OPINION AND SUGGESTIONS OF EXPERTS FOR ESTABLISHING CONTENT VALIDITY OF THE RESEARCH TOOL

From,

Ms. Sonika Kamal

MSc Nursing 2nd Year

Department of Medical Surgical Nursing

Adarsh College of Nursing Patiala, Punjab
To

.................

Forwarded through,

The Principal, Adarsh College of Nursing, Patiala, Punjab

Respected Sir/ Madam,

Sub: Request for opinions and suggestions of experts for establishing content validity of the research tool.

I, Ms. Sonika kamal has selected the below mentioned topic for a research project in partial fulfilment of the university requirement for the award of Master of Science in Nursing programme. I have developed a “A DESCRIPTIVE STUDY TO ASSESS THE KNOWLEDGE REGARDING CARE OF DIABETIC FOOT AMONG PATIENTS WITH DIABETES MELLITUS, ATTENDING OUT-PATIENT DEPARTMENTS IN SELECTED HOSPITALS OF DISTRICT PATIALA, PUNJAB WITH A VIEW TO DEVELOP AN INFORMATIONAL BOOKLET”.

I request you to kindly examine the tool for the content validity and give your expert opinion as per the evaluation checklist enclosed.

I would be highly obliged & remain thankful for your great help if you could validate my tool as early as possible.

Thanking you
Yours faithfully
Sonika Kamal

Enclosures:

1. Problem statement and objectives of the study.
2. Blue Print form for validation of tool
3. Acceptance form for validation of tool questionnaire
4. Self-structured knowledge validation of tool
5. Evaluation criteria rating scale for
6. Content validity certificate
APPENDIX-IX

CONTENT TO VALIDITY CERTIFICATE

This is to certify that the tool developed by Ms. Sonika Kamal, M.Sc. Nursing 2nd year student of Adarsh College of Nursing, Patiala, Punjab (Affiliated to Baba Farid University of Health Sciences) is validated by undersigned and allowed to conduct the main study for dissertation entitled “A DESCRIPTIVE STUDY TO ASSESS THE KNOWLEDGE REGARDING CARE OF DIABETIC FOOT AMONG PATIENTS WITH DIABETES MELLITUS, ATTENDING OUT-PATIENT DEPARTMENTS IN SELECTED HOSPITALS OF DISTRICT PATIALA, PUNJAB.”

Date: 

Signature and seal of the expert

Name and Designation

Place:
APPENDIX-VII

EVALUATION CRITERIA RATING SCALE FOR VALIDATION OF TOOL

Respected Madam/Sir,

I request you to evaluate the research tool and give your valuable opinion and suggestions on the developed structured knowledge questionnaire. There are four responses. Please tick (√) mark in the appropriate column and give your remarks in the columns.

Your valuable opinion and kind co-operation will be highly appreciated.

Thanking you in anticipation

SECTION-I
Socio Demographic Data

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### SECTION- II

Self-structured knowledge questionnaire regarding the contraceptive methods

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Maximum Score = 30

Signature of the Evaluator
I am voluntarily participating in the study conducted by M.Sc. Nursing 2nd year student at Adarsh College of Nursing, Patiala, Punjab. Titled:

A Descriptive study to assess the knowledge regarding care of diabetic foot among patients with Diabetes Mellitus, attending out-patient departments in selected hospitals of district Patiala, Punjab with a view to develop an informational booklet.
I will also co-operate with the researcher in providing necessary information. I was explained that the information provided would be kept confidential and used only for above mentioned study purpose only.

Signature of the Investigator                                      Signature of Participant

Place:                                                             Date:

APPENDIX-VI (b)
SELF-STRUCTURED KNOWLEDGE QUESTIONNAIRE

Dear respondents,

I Ms. Sonika Kamal student of M.Sc. Nursing 2nd Year, specialty of Medical Surgical Nursing, would like to collect some information about knowledge of diabetic foot care. Kindly provide your answers. I assure you that all the information furnished by you is only for research study and will be kept confidential.

Select the appropriate option and tick [✓]

THE QUESTIONNAIRE CONSISTS OF FOUR SECTIONS:

SECTION-I: Socio-demographic data

SECTION-II: Self-structured knowledge questionnaire:

TOOL
SECTION – A

SOCIO-DEMOGRAPHIC DATA

Instruction :- Please tick(✓) the correct answer whichever you feel correct.

All the information which is provided by you, will be kept confidential.

1. Age (in year)
   a) 21-30 ( )
   b) 31-40 ( )
   c) 41-50 ( )
   d) 51-60 ( )

2. Sex
   a) Male ( )
   b) Female ( )

3. Religion
   a) Hindu ( )
   b) Christian ( )
   c) Muslim ( )
   d) Other ( )

4. Education
   a) Illiterate ( )
   b) Primary Education ( )
   c) Secondary Education ( )
   d) Graduate ( )

5. Marital Status
   a) Single ( )
   b) Married ( )
   c) Widow ( )
   d) Divorced ( )

6. Occupation
   a) Unemployed ( )
   b) Self employed ( )
   c) Private Employee ( )
   d) Government Employee ( )
7. **Type of work**
   a) Sedentary
   b) Heavy

8. **Monthly income in rupees**
   a) Below 8000
   b) 8000-15000
   c) 15000-20000
   d) Above 25000

9. **Family History of Diabetes Mellitus**
   a) Yes
   b) No

10. **If yes, relation to the parent**
   a) Parental
   b) Maternal
   c) Grand parents
   d) Other

11. **When was diabetes mellitus identified**
   a) Less than 6 month
   b) 6 month - 1 year
   c) 1 year - 5 years
   d) Above 5 years

12. **Do have awareness about diabetic foot care**
   a) Yes
   b) No

13. **If yes, source of information**
   a) Personal experience
   b) TV/Radio
   c) Magazines/Books
   d) Awareness programmes
Section –B

**Instruction** :- Please tick(✓) the correct answer whichever you feel correct.

All the information which is provided by you, will be kept confidential.

1. What do you understand by diabetes mellitus?
   a) Increased sugar level  
   b) Increased fluid level  
   c) Increased calcium level  
   d) Increased protein level  

2. What happen during the Diabetic neuropathy?
   a) Liver damage  
   b) Kidney damage  
   c) Brain damage  
   d) Nerve damage  

3. What of the following chemicals are released by the pancreas gland during and just after a meal?
   a) Insulin  
   b) Pepsin  
   c) Glucagon  
   d) Glycogen  

4. Which of the following statement confirm the values of the threshold for diabetes?
   a) Fasting blood glucose equal to or greater than 140mg/dl  
   b) Fandom glucose greater than 160 mg/dl  
   c) Fandom glucose greater than or equal to 100 mg/dl  
   d) Fasting blood glucose equal to or greater than 126mg/dl  

5. What is the action of insulin during metabolism?
   a) Enhances lipogenesis  
   b) Inhibits glycogenolysis  
   c) Promotes protein synthesis  
   d) All of the above  

6. Which are not the risk factors for diabetes mellitus?
   a) Diet  


7. What are symptoms of diabetes insipidus?
   a) Excessive thirst
   b) Dilute urine
   c) Both a and b
   d) Insomnia

8. Which one is not the result of untreated diabetes?
   a) Blindness
   b) Cardiovascular disease
   c) Kidney disease
   d) Tinnitus

9. What are complications of diabetes if untreated?
   a) Foot ulcer
   b) Heart attack
   c) Migraine
   d) Tonsils

10. Which of the following measures does not help to prevent diabetes complication?
    a) Controlling blood glucose
    b) Controlling blood pressure and blood lipids
    c) Eliminating all carbohydrates from the diet
    d) Prompt detection of diabetic eye and kidney disease

11. How the diabetes affects the feet?
    a) Can cause nerve damage
    b) Can cause hardening of the blood vessels
    c) Both A and B are correct
    d) Can cause brain hemorrhage

12. What else can happen when you have foot related neuropathy?
    a) Malformation of the feet
    b) Discoloration of the feet
    c) Fracture of the feet
13. What are the signs of infectious foot?
   a) Redness, Swelling, Hot to the touch
   b) Blurry vision, Increase thirst, Increase hunger
   c) Bruising, Pain, Lesions
   d) Tiredness, Fatigue, Weight loss

14. How is the skin of feet in diabetes patient?
   a) Dry
   b) Blistered
   c) Moist
   d) Soft

15. Which of the following are good foot care tips for people with diabetes?
   a) Have good blood glucose control
   b) Do daily foot care and inspections
   c) Try to do some form of exercise several times per week
   d) All of the above

16. What is the best time to buy shoes of diabetic patient?
   a) First thing in the morning
   b) Midday around lunchtime
   c) Towards the end of the day
   d) Anytime during the day

17. How often should you inspect your feet if you have diabetes?
   a) Every day
   b) Once a week
   c) Once in 2-3 week
   d) Once in month

18. Why should you avoid putting cream between your toes?
   a) It can lead to irritation
   b) It can lead to infection
   c) It can lead to skin rashes
   d) It can lead to muscular pain
19. What may happen if you do not remove calluses from your feet?
   a) They can turn into ulcers
   b) They can become infected
   c) Both a and b
   d) They can turn into itchy skin

20. How do you prevent calluses from getting out of control?
   a) Using a talcum powder every day
   b) Apply lotion on feet every day
   c) Using oil daily
   d) Using hydrogen peroxide

21. Which part of the foot ulcers occur most often?
   a) Wall of the foot
   b) The bottom of big toe
   c) Both a and b
   d) The tip of toe

22. What will your doctor likely recommended if you have a foot ulcer?
   a) Stay off your feet
   b) Scrub your feet with soapy water daily
   c) Use antibiotics
   d) Apply moisture daily

23. What will happen when a small cut or blister occurs on the foot?
   a) Have no pain
   b) Have pain
   c) Have itching
   d) Have puss

24. How do you know if the nerves in your feet are damaged?
   a) There are no symptoms
   b) Feet may feel cold or pale
   c) Feet may tingle or feel numb
   d) All of the above are true

25. What are the causes for flat feet?
26. What is the most important way to prevent diabetic foot problems?
   a) Keep blood sugar and A1C within good target ranges
   b) Wear well-fitting shoes
   c) Never go barefoot
   d) Do exercise

27. Why you inspect your feet and between your toes daily?
   a) Small pebbles between toes
   b) Small blisters or cracks
   c) Dryness
   d) Swelling

28. What you should do if you have any signs of infections such as redness, swelling, drainage or a fever?
   a) Call your doctor immediately
   b) Call manatee your choice diabetes educator
   c) Watch it and wait for a while
   d) None of these

29. Which area is avoided during applying the lotion on feet every day?
   a) Between the toe
   b) Heel
   c) Bottom of toe
   d) Centre of feet

30. What is the best time to cut toenails?
   a) After a bath or shower
   b) After walking
   c) After taking medicine
   d) After meal

31. Why do people with diabetes need to take extra care to avoid foot injury?
a) They can easily get an infection
b) They may not feel the pain of the injury
c) People with diabetes have more complications
d) They cause fever

32. Which of these tips are true?
a) Never use lotion on the feet
b) Never walk barefoot
c) Turn shoes upside down and shake before putting them on
d) B and C are both true

33. What you will do if you have corns or calluses and want to trim them?
a) Consult to doctor or a podiatrist
b) Trim by yourself
c) Trim by family
d) Take as there

34. What will happen when walking barefoot on a hot sunny driveway?
a) Feeling cool
b) Harm feet
c) Increased body temperature
d) Feeling dizziness

35. What is the best way to treat a fungal nail infection?
a) Oral medication
b) Over-the-counter topical creams
c) Surgical removal
d) Allowing the infection time to heal

**Scoring Key**

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BOOKLET REGARDING CARE OF DIABETIC FOOT IN DIABETIC PATIENT

INTRODUCTION

The pancreas is an organ of the digestive system and endocrine system of vertebrates. In humans, it is located in the abdomen behind the stomach and functions as a gland.

The pancreas has both an endocrine and a digestive exocrine function.

As an endocrine gland, it functions mostly to regulate blood sugar levels, secreting the hormones insulin, glucagon, and pancreatic polypeptide.

As a part of the digestive system, it functions as an exocrine gland secreting pancreatic juice into the duodenum through the pancreatic duct. This juice contains bicarbonate, which neutralizes acid entering the duodenum from the stomach; and digestive enzymes, which break down carbohydrates, proteins, and fats in food entering the duodenum from the stomach.
Diabetes mellitus, commonly known as diabetes, is a metabolic disease that causes high blood sugar. The hormone insulin moves sugar from the blood into your cells to be stored or used for energy. With diabetes, your body either doesn’t make enough insulin or can’t effectively use the insulin it does make. Untreated high blood sugar from diabetes can damage your nerves, eyes, kidneys, and other organs.

NORMAL AND DIABETIC BLOOD SUGAR RANGES

For the majority of healthy individuals, normal blood sugar levels are as follows:

- **Between** 4.0 to 5.4 mmol/L (72 to 99 mg/dL) when fasting
- **Up to** 7.8 mmol/L (140 mg/dL) 2 hours after eating

For people with diabetes, blood sugar level targets are as follows:

- **Before meals**: 4 to 7 mmol/L for people with type 1 or type 2 diabetes
- **After meals**: under 9 mmol/L for people with type 1 diabetes and under 8.5 mmol/L for people with type 2 diabetes

There are a few different types of diabetes:

- Type 1 diabetes is an autoimmune disease. The immune system attacks and destroys cells in the pancreas, where insulin is made. It’s unclear what causes this attack. About 10 percent of people with diabetes have this type.
• Type 2 diabetes occurs when your body becomes resistant to insulin, and sugar builds up in your blood.

• Prediabetes occurs when your blood sugar is higher than normal, but it’s not high enough for a diagnosis of type 2 diabetes.

• Gestational diabetes is high blood sugar during pregnancy. Insulin-blocking hormones produced by the placenta cause this type of diabetes.

**Symptoms of diabetes**

Diabetes symptoms are caused by rising blood sugar.

**General symptoms**

The general symptoms of diabetes include:

• increased hunger
• increased thirst
• weight loss
• frequent urination
• blurry vision
• extreme fatigue
• wound that don’t heal
• Decreased sex drive
• Poor muscle strength
• Urinary tract infections
• Yeast infections

**Causes of diabetes**

Different causes are associated with each type of diabetes.

• Doctors don’t know exactly what causes type 1 diabetes.

• The immune system mistakenly attacks and destroys insulin-producing beta cells in the pancreas.

• Genes may play a role in some people.

• Type 2 diabetes stems from a combination of genetics and lifestyle factors.

• Being overweight or obese increases your risk too.

• Gestational diabetes is the result of hormonal changes during pregnancy. The placenta produces hormones that make a pregnant woman’s cells less sensitive to the effects of insulin. This can cause high blood sugar during pregnancy.

**Risk factors**

• Family history of diabetes (parents or siblings with diabetes)

• Obesity (≥ 20% over weight or BMI ≥27kg/m²)
- Race/ethnicity (eg. African American, Hispanic or Latino American, Alaska Native, Pacific Islander, American Indian, or Asian American ancestry)
- Age ≥45 years
- High blood pressure, high cholesterol, or high triglycerides
- Gestational diabetes during a past pregnancy
- Have given birth to a baby weighing more than 9 pounds
- Have polycystic ovary syndrome (PCOS)

**Diabetes diagnosis**

Anyone who has symptoms of diabetes or is at risk for the disease should be tested. Women are routinely tested for gestational diabetes during their second or third trimesters of pregnancy.

- The fasting plasma glucose (FPG) test measures your blood sugar after you’ve fasted for 8 hours.
- The A1C test provides a snapshot of your blood sugar levels over the previous 3 months.
- To diagnose gestational diabetes, your doctor will test your blood sugar levels between the 24th and 28th weeks of your pregnancy.
- During the glucose challenge test, your blood sugar is checked an hour after you drink a sugary liquid.

**Management and Treatment of diabetes**

Doctors treat diabetes with a few different medications. Some of these drugs are taken by mouth, while others are available as injections.

- Insulin is the main treatment for type 1 diabetes. It replaces the hormone your body isn’t able to produce.
- There are four types of insulin that are most commonly used. They’re differentiated by how quickly they start to work, and how long their effects last:
  - Rapid-acting insulin starts to work within 15 minutes and its effects last for 3 to 4 hours.
  - Short-acting insulin starts to work within 30 minutes and lasts 6 to 8 hours.
  - Intermediate-acting insulin starts to work within 1 to 2 hours and lasts 12 to 18 hours.
  - Long-acting insulin starts to work a few hours after injection and lasts 24 hours or longer.
- Diet and exercise can help some people manage type 2 diabetes. If lifestyle changes aren’t enough to lower your blood sugar, you’ll need to take medication.

**Diabetes and diet**

Healthy eating is a central part of managing diabetes. In some cases, changing your diet may be enough to control the disease.

Your blood sugar level rises or falls based on the types of foods you eat.

- Starchy or sugary foods make blood sugar levels rise rapidly.
Protein and fat cause more gradual increases. In order to keep your blood sugar levels steady, try to eat small meals throughout the day. Emphasize healthy foods such as:

- fruits
- vegetables
- whole grains
- lean protein such as poultry and fish
- healthy fats such as olive oil and nuts

If you’ve been diagnosed with prediabetes, here are a few things you can do to delay or prevent type 2 diabetes:

- Get at least 150 minutes per week of aerobic exercise, such as walking or cycling.
- Cut saturated and trans fats, along with refined carbohydrates, out of your diet.
- Eat more fruits, vegetables, and whole grains.
- Eat smaller portions.
- Try to lose 7 percent trusted Source of your body weight if you’re overweight or obese.
- Eating a well-balanced diet is important for both you and your baby during these nine months. Making the right food choices can also help you avoid diabetes medications.

**Complications**

High blood sugar damages organs and tissues throughout your body. The higher your blood sugar is and the longer you live with it, the greater your risk for complications.

Complications associated with diabetes include:

- Heart disease, heart attack, and stroke
- Neuropathy
- Nephropathy
- Retinopathy and vision loss
- Hearing loss
- **Foot damage such as infections and sores that don’t heal**
- Skin conditions such as bacterial and fungal infections
- Depression
- Dementia
Diabetes can cause two problems that can affect your feet:

- **Diabetic neuropathy.** Uncontrolled diabetes can damage your nerves. If you have damaged nerves in your legs and feet, you might not feel heat, cold, or pain there. This lack of feeling is called "sensory diabetic neuropathy."

- **Peripheral vascular disease.** Diabetes also affects the flow of blood. Without good blood flow, it takes longer for a sore or cut to heal. Poor blood flow in the arms and legs is called "peripheral vascular disease."

**Foot ulcer or Diabetic foot**

- A non-healing or poorly healing full-thickness wound, through the dermis, below the ankle in an individual with diabetes, critical in the natural history of the diabetic foot.
- They are categorized as being purely neuropathic, purely ischemic or neuroischemic (mixed).
- Most common sites: plantar surface of foot (metatarsal heads and midfoot), toes (dorsal interphalangeal joints or distal tip).
- Foot ulcer frequently caused by repetitive injury to an insensate or dysvascular foot.

**Risk factor of diabetic foot**

a) Evidence of neuropathy
b) Evidence of ischaemia
c) Foot deformities
d) Callus at pressure areas
e) Impairment of sight
f) Previous history of foot ulcers

g) Elderly

**Grading of diabetic foot ulcers**

**Grade 0** High risk foot, no ulcers

**Grade 1** Superficial ulcer, skin deep

**Grade 2** Deeper ulcer, usually with infection/cellulitis, no bone involvement

**Grade 3** Osteomyelitis and foot ulceration

**Grade 4** Localised gangrene (toes, forefoot or heel)

**Grade 5** Gangrene of entire foot

**Signs of Diabetic Foot Problems**

If you have diabetes, contact your doctor if you have any of these problems:

- Changes in skin color
- Changes in skin temperature
- Swelling in the foot or ankle
- Pain in the legs
- Open sores on the feet that are slow to heal or are draining
- Ingrown toenails or toenails infected with fungus
- Corns or calluses
- Dry cracks in the skin, especially around the heel
- Foot odor that is unusual or won't go away
Complications of Diabetic Foot Problems

- **Skin and bone infections.** A small cut or wound can lead to infections. Nerve and blood vessel damage, along immune system problems, make them more likely. Infections can be treated with antibiotics.

- **Abscess** Sometimes infections eat into bones or tissue and create a pocket of pus called an abscess. The common treatment is to drain the abscess.

- **Gangrene** Diabetes affects the blood vessels that supply your fingers and toes. When blood flow is cut off, tissue can die. Treatment is usually oxygen therapy or surgery to remove the affected area.

- **Deformities** Nerve damage can weaken the muscles in your feet and lead to problems like hammertoes, claw feet, prominent metatarsal heads (ends of the bones below your toes).

- **Charcot foot** Diabetes can weaken the bones in your foot so much that they break. You keep walking on broken bones and your foot will change shape. It might look like your arch has collapsed into a rocker shape.

- **Amputation** When an infection can’t be healed, creates an abscess, or if low blood flow leads to gangrene, amputation is often the best treatment.

Treatment and Management
Stay off your feet to prevent pain and ulcers. This is called **off-loading**, and it’s helpful for all forms of diabetic foot ulcers. Pressure from walking can make an infection worse and an ulcer expand. For people who are overweight, extra pressure may be the cause of ongoing foot pain.

Your doctor may recommend wearing certain items to protect your feet:

- Diabetic shoes
- Casts
- Food braces
- Compression wraps
- Shoe inserts to prevent corns and calluses

Doctors can remove diabetic foot ulcers with a **debridement**, the removal of dead skin, foreign objects, or infections that may have caused the ulcer.

An infection is a serious complication of a foot ulcer and requires immediate treatment.

Infection of a foot ulcer can be prevented with:

- Foot baths
- Disinfecting the skin around an ulcer
- Keeping the ulcer dry with frequent dressing changes
- Enzyme treatments
- Dressings containing calcium alginates to inhibit bacterial growth

**Medications**

Your doctor may prescribe antibiotics, antiplatelets, or anti-clotting medications to treat your ulcer if the infection progresses even after preventive or anti-pressure treatments.

**Over-the-Counter Treatments**

Many topical treatments are available for foot ulcers, including:

- Dressings containing silver or silver sulphadiazine cream
- Polyhexamethylene biguanide (PHMB) gel or solutions
- Iodine (either povidone or cadexomer)
- Medical grade honey in ointment or gel form

**Lifestyle Management**

**Tips for Diabetic Foot Care**

Proper foot care can prevent these common foot problems or treat them before they cause serious complications. Here are some tips for good foot care:

1. Take care of yourself and your diabetes. Follow your doctor's advice regarding nutrition, exercise, and medication. Keep your blood sugar level within the range recommended by your doctor.
2. Wash your feet in warm water every day, using a mild soap. Test the temperature of the water with your elbow because nerve damage can affect sensation in your hands, too. Do not soak your feet. Dry your feet well, especially between your toes.

3. Check your feet every day for sores, blisters, redness, calluses, or any other problems. If you have poor blood flow, it is especially important to check your feet daily.

4. If the skin on your feet is dry, keep it moist by applying lotion after you wash and dry your feet. Do not put lotion between your toes. Your doctor can tell you which type of lotion is best.

5. Gently smooth corns and calluses with an emery board or pumice stone. Do this after your bath or shower, when your skin is soft. Move the emery board in only one direction.

6. Check your toenails once a week. Trim your toenails with a nail clipper straight across. Do not round off the corners of toenails or cut down on the sides of the nails. After clipping, smooth the toenails with a nail file.

7. Always wear closed-toed shoes or slippers. Do not wear sandals and do not walk barefoot, even around the house.

8. Wear socks or stockings. Wear socks or stockings that fit your feet well and have soft elastic.

9. Wear shoes that fit well. Buy shoes made of canvas or leather and break them in slowly. Extra wide shoes are also available in specialty stores that will allow for more room for the foot if you have a foot deformity.

10. Always check the inside of shoes to make sure that no objects are left inside.

11. Protect your feet from heat and cold. Wear shoes at the beach or on hot pavement. Wear socks at night if your feet get cold.

12. Keep the blood flowing to your feet. Put your feet up when sitting, wiggle your toes and move your ankles several times a day, and don’t cross your legs for long periods.

13. If you smoke, stop. Smoking can make problems with blood flow worse.

14. If you have a foot problem that gets worse or won’t heal, contact your doctor.

15. Make sure your diabetes doctor checks your feet during each checkup. Get a thorough foot exam once a year.

16. Consult with doctor if not improved.
THE FOOT CARE GUIDE
THE 9-STEP DAILY FOOT CARE GUIDE FOR PEOPLE WITH DIABETES

1. Wash your feet every day with lukewarm water and soap.
2. Dry your feet well, especially between the toes.
3. Moisturise your feet, but not between the toes.
4. Check your feet for blisters, cuts or sores.
5. Keep your toenails at a reasonable length.
6. Wear clean socks that aren’t too big or small.
7. Keep your feet warm and dry with shoes that fit comfortably.
8. Never walk barefoot indoors or outdoors.
9. Examine your shoes for things that might hurt your feet.

These daily foot checks are recommended, along with attending your foot care review which needs to be organised through your healthcare provider.
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ू टटटटट�; ( )

ू टटटट�; ( )
5. ਹਾਲਾਂਕਿ, ਪਹਿਲੇ ਹੀ ਹੋਰ ਰੀਤੀ-ਰੀਤੀ ਸਮਾਂ ਦੀ ਸ਼ਾਇਰਾਤੀ 140 mg/dl; %?
   a) 
   b) 
   c) 
   d) 

6. ਇੱਕ mellitus ਦੀ ਸੰਘਿਤਾ ਦੀ ਸਮਾਂ ਦੀਆਂ ਸੰਘਿਤਾ ਦੀਆਂ?
   a) 
   b) 
   c) 
   d) 

7. ਹਾਲਾਂਕਿ, ਪਹਿਲੇ ਹੀ ਹੋਰ ਰੀਤੀ-ਰੀਤੀ ਸਮਾਂ ਦੀ ਸ਼ਾਇਰਾਤੀ 160 mg/dl; %?
   a) 
   b) 
   c) 
   d) 

8. ਇੱਕ mellitus ਦੀ ਸੰਘਿਤਾ ਦੀ ਸਮਾਂ ਦੀਆਂ ਸੰਘਿਤਾ ਦੀਆਂ?
   a) 
   b) 
   c) 
   d) 

9. ਹਾਲਾਂਕਿ, ਪਹਿਲੇ ਹੀ ਹੋਰ ਰੀਤੀ-ਰੀਤੀ ਸਮਾਂ ਦੀ ਸ਼ਾਇਰਾਤੀ 126 mg/dl; %?
   a) 
   b) 

c) erta

d) erta


a) わら; わら わら わら わら わら わら わら わら わら

b) わら; わら わら わら わら わら わら わら わら わら

c) わら; わら わら わら わら わら わら わら わら わら

d) わら; わら わら わら わら わら わら わら わら わら


a) わら, わら, わら


b) 2-3

c) 8 8 H

19. 8 8 H

20. 8 8 K

22. 8 8 K
23. "8 ਡਾ 'ਰੂਪ ਵੋਹੀਂ ਰੋਕਣਾ ਅਰਥਾਤ ਹਥਹਾਨੀ; ਹਿੰਦੂ ਸਾਹਿਤਕ ਰੂਪ ਹੁੰਦਾ। ਜਦੋਂ ਕਿ ਸਾਹਿਤਕੀ ਵਿਚ ਵੀ ਕੋਈ ਅਧਿਆਪਨ ਜਾਣਨਾ ਹੋਇਆ ਹੋਇਆ?
   a) ਦੀਤੇ ਸੋਨਾ ਰੋਕਨਾ?
   b) ਦੀਤੇ ਸੋਨਾ ਰੋਕਨਾ?
   c) ਦੀਤੇ ਸੋਨਾ ਰੋਕਨਾ?
   d) ਦੀਤੇ ਸੋਨਾ ਰੋਕਨਾ?

25. ਹੀਂ ਹੀਂ ਹੀਂ; ਹੀਂ ਹੀਂ ਹੀਂ ਹੀਂ?
   a) ਦੀਤੇ ਸੋਨਾ ਰੋਕਨਾ?
   b) ਦੀਤੇ ਸੋਨਾ ਰੋਕਨਾ?
   c) ਦੀਤੇ ਸੋਨਾ ਰੋਕਨਾ?
   d) ਦੀਤੇ ਸੋਨਾ ਰੋਕਨਾ?

26. ਹੀਂ ਹੀਂ ਹੀਂ; ਹੀਂ ਹੀਂ ਹੀਂ ਹੀਂ?
   a) ਦੀਤੇ ਸੋਨਾ ਰੋਕਨਾ?
   b) ਦੀਤੇ ਸੋਨਾ ਰੋਕਨਾ?
   c) ਦੀਤੇ ਸੋਨਾ ਰੋਕਨਾ?
   d) ਦੀਤੇ ਸੋਨਾ ਰੋਕਨਾ?

27. ਹੀਂ ਹੀਂ ਹੀਂ; ਹੀਂ ਹੀਂ ਹੀਂ ਹੀਂ?
   a) ਦੀਤੇ ਸੋਨਾ ਰੋਕਨਾ?
   b) ਦੀਤੇ ਸੋਨਾ ਰੋਕਨਾ?
   c) ਦੀਤੇ ਸੋਨਾ ਰੋਕਨਾ?
   d) ਦੀਤੇ ਸੋਨਾ ਰੋਕਨਾ?
29. ਟਟਟਟ ਟਟਟਾ; ' ਟਟਟ ਟਟਟਨਾ ਟਟਾ ਟਟਾਨਾ ਟਟਾਨਾ ਟਟਾਨਾ ਟਟਾਨਾ ਟਾਨਾ 8 ਟਾਨਾ 8; ਟਾਨਾਟਾ? 
   a) ਟਟਾਨਾ J ਟਾਨਾ 
   b) 8% 8 
   c) ਟਟਾਨਾ J ਟਾਨਾ 
   d) ਟਾਨਾ; ਟਾ ਟਾ K 
   
30. ਟਾਨਾ ਟਾਨਾ 
   a) ਟਟਟਟਾ; ਟਾਨਾ 8 ਟਾਨਾ 
   b) ਟਟਟ ਟਾਨਾ 
   c) ਟਟਟ ਟਾਨਾ 8 ਟਾਨਾ 
   d) ਟਟਟ ਟਾਨਾ 
   
31. ਟਟਾਨਾ ਟਟਾਨਾ? 
   a) ਟਟਟਟ ਟਟਟਾ ਟਟਟਟ 
   b) 8% 
   
32. ਟਾਨਾ; ਟਾਨਾ 8 ਟਾਨਾ ਟਾਨਾ ਟਾਨਾ? 
   a) ਟਾਨਾ; ' ਟਟ ਟਾਨਾ ਟਟਟਾ ਟਾਨਾ 8 ਟਾਨਾ 
   b) ਟਟਟਾ ਟਟਾਨਾ ਟਟਾਨਾ 
   
33. ਟਟਾਨਾ 
   a) ਟਟਟਾਨਾ ਟਟਟ 
   b) ਟਟਟ ਟਟਟਾ 
   c) 8% 
   d) ਟਟਟ 
   
34. 8 ਟਾਨਾ 8% ਟਟਾਨਾ ਟਟਾਨਾ ਟਟਾਨਾ ਟਟਾਨਾ ਟਟਾਨਾ ਟਟਾਨਾ ਟਟਾਨਾ? 
   a) ਟਟਟ 
   b) 8% 
   c) 8% 
   d) 8% 
   
35. ਟਟਟ ਟਟਟਾ 8 ਟਟਟਾ 8 ਟਟਟਾ 8 ਟਟਟਾ 8 ਟਟਟਾ 8 ਟਟਟਾ 8 ਟਟਟਾ 8 ਟਟਟਾ 8 ਟਟਟਾ 8 ਟਟਟਾ 8?
APPENDIX-IX

LIST OF EXPERTS

1. **Mrs. Jaya D. Shirshetty**  
   Principal  
   Adarsh College of Nursing  
   Patiala.

2. **Mrs. Kuldishkaur**  
   Principal  
   Govt. Nursing College  
   Patiala, Punjab.

3. **Mrs. Inderpalkaur**  
   Assistant Professor MSN  
   Govt. Nursing College  
   Patiala, Punjab.

4. **Mrs. Sweety**  
   Assistant Professor OBG  
   Adarsh College of Nursing  
   Patiala, Punjab.

5. **Mrs. Jaspreeykaursoudi**  
   Assistant Professor MSN  
   Govt. Nursing College  
   Patiala, Punjab.

6. **Mrs. Amritbirkaur**  
   Assistant Professor CHN  
   Adarsh College of Nursing  
   Patiala, Punjab.

7. **Mrs. Seema**  
   Tutor Medical Surgical Nursing  
   Govt. Nursing College  
   Patiala, Punjab.

8. **Mrs. Urmil**  
   Tutor Medical Surgical Nursing  
   Govt. Nursing College  
   Patiala, Punjab.

9. **Dr. Sanjay Bansal**
Medical officer
C.H.C Tripuri

10. Dr. Parmindarpaul
M.D. Medicine
C.H.C. Tripuri
Patiala