

AN EXPLORATORY STUDY TO ASSESS THE PRACTICES OF WOMEN REGARDING DIABETES MELLITUS IN SELECTED URBAN AREAS OF LUDHIANA, PUNJAB

Author: Sangeeta Nichols

Assistant Professor

CON, CMC Hospital, Ludhiana

Email psangeeta33@gmail.com

Abstract:

The present study was conducted to assess the practices of women regarding diabetes in selected urban areas of Ludhiana, Punjab. The aim of the study was to identify the practices of women regarding diabetes mellitus with a view to develop guidelines based on the findings of the study. The objectives of the study were to assess the practices of women regarding diabetes mellitus, to identify relationship between practices of women regarding diabetes mellitus with selected variables age, education, occupation, family income and dietary pattern & family history of diabetes mellitus, to find out the deficit areas and develop guidelines regarding diabetes mellitus. It was assumed that women do have healthy practices. Conceptual framework was based on Modified Fitts and Posner's Three Phase Theory of Task Performance (1967). The area selected for study was New Shivaji Nagar and Mohar Singh Nagar of Ludhiana, Punjab. The exploratory approach and non experimental research design was used in the study. Using purposive sampling technique, 200 women in age between 30-60 years were selected. Data was collected with the help of check list. Pilot study was done on 20 subjects to check the feasibility and practicability of the study. Analysis of the data was done in accordance with the objectives of the study by using descriptive and inferential statistics. Final study was conducted in the month of Dec, 2012. Conclusions were drawn based on the findings of the study i.e. most of the women had unhealthy practices regarding diabetes mellitus. The area of healthy practices was seen maximum in risk behavior and minimum in health check up regarding diabetes mellitus. It was inferred that education, dietary pattern and family income had significant relationship with practices of women regarding diabetes mellitus. Guidelines and health education was given to women to improve their practices regarding diabetes mellitus.

Key Words: *Diabetes Mellitus, Women, Practices*

CHAPTER-I

BACKGROUND OF THE STUDY

- **Introduction**

This Sanskrit slogan of ‘Charaka’ gives overall concept of diabetes mellitus. This means diabetes comes in the form of death to those who are obese, live without exercise and eat more especially sweet items. Earliest known record of diabetes mentioned in the Egyptian papyrus. It mentions polyuria (frequent urination) as a symptom in Ist century AD. Diabetes was discovered by Arateus as “the melting down of flesh and limbs into urine” (**Charaka SN, 1941**)¹.

Diabetes is described as a disease in which blood glucose levels are above normal. When we eat a mixed diet, most of the carbohydrates in the meal are turned into glucose, or sugar, for our bodies to use for energy. The pancreas, an organ that lies near the stomach, makes a hormone called insulin to help glucose get into the cells of our bodies. When you have diabetes, your body either doesn’t make enough insulin or can’t use its own insulin or can’t use its own insulin as well as it should. This causes sugar to build up in your blood (**Center for Disease Control, 2004**)².

Diabetes mellitus is a group of metabolic disorders with multiple etiologies characterized by chronic hyperglycemia with disturbance of carbohydrate and fat, resulting from insulin defect in secretion or action. In 1959 two major types (Type 1 and Type 2) diabetes mellitus were discovered. Type 1 diabetes mellitus appears as a result of autoimmune destruction of beta cells or may be idiopathic. Approximately 5-10% people with diabetes are type 1, occurring usually before the age of 30 years. The more common type 2 diabetes mellitus, affecting mostly adults manifest as a result of insulin resistance. Approximately 90-95% people have type 2, occurring usually in the people who are older than 30 years. The other specific types are impaired fasting glucose (IFG), impaired glucose tolerance (IGT), gestational diabetes and some genetic defects of Beta cells. Obesity and lack of exercise are the most important factors in precipitating diabetes (**Brunner and Sudharth, 2004**)³.

Usually, the symptoms of Type I diabetes are obvious. That is not true for Type II. Many people with Type II do not discover they have diabetes until they are treated for a complication such as heart disease, blood vessel disease (atherosclerosis), stroke, blindness, skin ulcers, kidney problems, nerve trouble or impotence. The warning signs and symptoms for both types are: Frequent urination,

increased thirst, extreme hunger, unexplained weight loss, extreme fatigue, blurred vision, irritability, nausea and vomiting, unexplained weight gain, pain, cramping, tingling or numbness in your feet, unusual drowsiness, frequent vaginal or skin infections, dry, itchy skin and slow healing sores **(Health Encyclopedia, 2009)⁴**.

Type 1 diabetes, also referred to as insulin-dependent diabetes mellitus (IDDM) or as juvenile onset is relatively early in life, in childhood or adolescence and usually before the age of thirty. This type of diabetes is a relatively homogeneous disease in which the insulin secretion of beta cells in the pancreas declines and eventually ceases totally. **(Aalto A, 1999)⁵**. Type 2 diabetes can be linked to be accounting for around 90 per cent of all cases, it is a chronic metabolic disorder, in which the body is unable to utilize glucose from food because of the inability of the pancreas to produce insulin or produces insufficient insulin, or the insulin itself is inactive **(Naemiratch & Manderson, 2007)⁶**.

Diabetes Mellitus, specifically, type 2 diabetes is at the cross-roads of 21st century globalization and health. Currently, 246 million people are estimated to have diabetes mellitus, and this number is projected to increase to over 380 million worldwide in the next 20 years. An additional 200 million people are likely to have impaired glucose tolerance, a precursor for type 2 diabetes and this is expected to rise to 420 million by 2025. In developing countries, the disease disproportionately strikes people of economically active ages, resulting in loss of human capital and productivity. The major risk factors for type 2 diabetes include obesity, physical inactivity, unhealthy life style, energy dense diets, which are increasingly a consequence of industrialization, urbanization and globalization **(Candian Diabetes Association, 2013)⁷**.

- ***Need of the Study***

According to recent statistics from the World Health Organization, currently diabetes is holding the 15th place in the list of causes of death worldwide and expected to affect 300 million people globally by the year 2025 compared to 135 million in 1995. Moreover, the increase in prevalence of diabetes in developing countries is projected to be 170% compared to 42% in developed countries. Thus, developing nations would contribute to more than 75% of the global diabetes burden by the year 2025 **(Viswanathan M, Hossain P, Kavar B & Nahas ME, 2010)¹³**.

Women are more likely than men to develop chronic diseases, such as diabetes, and to suffer disproportionately from disability compared to men. It is important to target women at high risk for diabetes for intervention to reduce their risk of diabetes. Evidence shows that people with prediabetes who lose 5 to 7% of their body weight and increase their physical activity can prevent or delay diabetes. Early interventions and access to preventive care services are important for women to reduce the risk of developing other diseases, such as cardiovascular disease. However, very few studies have examined preventive care measures for women at high risk for diabetes (Jacobs, 2009)¹⁴.

A study was done in Jalandhar, the incidence of diabetes mellitus in urban Punjab is on the rise, according to the study and the number of diabetics is increasing year after year. Experts are of the opinion that sedentary lifestyles and eating habits are responsible for at least 50% of the increase in diabetes cases and large number of people around us are neither aware of the high-risk factors nor the fact that they are diabetic. There are a total number of 150 million diabetics in the world and after 25 years the figure is likely to double, a bigger number of individuals would be at risk because of obesity, alcohol, tobacco abuse, physical inactivity and stress. There are an estimated 29 million diabetics in India and it is estimated that every fifth person with diabetes will be an Indian. The number is likely to double in 25 years. Due to these sheer numbers, the economic burden due to diabetes in India is amongst the highest in the world. The reason: lifestyle,” One in every eight adults is diabetic in urban India, while in the countryside the figure is one in twenty. The rise in prevalence of diabetes mellitus is 73% in developing countries compared to 20% in the developed world” (Gupta R, 2009)¹⁵.

The study was done to determine prevalence of known diabetes in those more than 20 years of age in Chennai city. Urban population was selected for the survey. Assuming the prevalence of known diabetes as 5.0% in those aged > 20 years, the cluster sample size was 25800 individuals of all ages. This population obtained from 200 households in each of 30 randomly selected corporation divisions of the city, was surveyed by social workers by house to house enquiry. Among 26,066 individuals of all ages 779 had known diabetes and 99.4% of them had type 2 diabetes. The prevalence of known diabetes was low in total population but increased in those aged > 20 and further increased in those aged > or = 40 years. The causes for high prevalence in > or = 40 year age group needs to be explored in this population (Bai A , Murthy BN, Chellamariappan M, Gupte MD & Krishnaswami CV, 2001)¹⁶.

Diabetes does not just happen overnight, it takes many years for it to set in as a derangement of metabolism. That gives us a chance to early detection, possible prevention or delaying the onset. Any person with, diabetes in family, obesity, physical or mental stress, needs to check blood glucose once a year after 30 years age. Potential diabetics are those who show an abnormality of glucose levels in blood only during stress situations like surgery, accidents, any illness or pregnancy, and become normal afterwards. They have high chances of becoming diabetics, and need to be frequently screened to identify the onset. So very early diagnosis is needed and it is mandatory to screen everyone above the age of 30 years at least once in a year (**Paturi VR, 2011**)²¹.

The study was conducted to assess the level of community awareness of diabetes and how this knowledge influences their attitude and practices in prevention and control of the disease. Of the targeted 2000 respondents, 1982 (99.1%) were interviewed in which females 1151 (58.1%) than males 831 (41.9%) interviewed. Since the knowledge referred to in this study was the conventional form obtained from the formal information, communication and education systems, the reason for good practice among 37.4% of people with no knowledge was associated with their indigenous knowledge. It is therefore important to identify interventions that reinforce peoples' attitudes despite their levels of knowledge of a particular subject (**Badrudin N, Basit A, Hydrie ZI & Hakeem R, 2002**)²⁵.

The Diabetes Prevention Program Research Group conducted a large, randomized clinical trial involving adults in the United States who were at high risk for the development of type 2 diabetes and found that type 2 diabetes can be prevented or delayed in persons at high risk for the disease. Increasing evidence of effective interventions, including changes in diet and physical activity or pharmacological treatment to reduce prevalence of diabetes, provides an impetus for wider introduction of preventive approaches (**Diabetes Prevention Program Research Group, 2000**)²⁶.

Physical inactivity, obesity and diet, are considered major factors in the etiology of diabetes mellitus and hypertension. Obesity can contribute significantly to heart disease and resulting disabilities. There is little information about the influence of changes in lifestyle, such as the reduction of physical activity and inadequate diet, on the prevalence of chronic non communicable diseases such as diabetes and hypertension. Diabetes and hypertension occurred most frequently in people over 39 years of age, particularly women. These results correspond with the greater prevalence of risk factors found in these population groups, such as overweight, large waist circumference, sedentary life style, and hypercholesterolemia. (**Pan American Health Organization, 2007**)²⁷.

The investigator, while working in the community observed that women did not have adequate knowledge regarding diabetes mellitus as they were having sedentary life styles. Most of them were generally not aware about unhealthy practices and many myths and misconception were still practicing in the society related to diet, exercise and healthy lifestyles behaviors which can put them at risk for diabetes mellitus. Investigator has also read articles in newspapers about the incidence of diabetes mellitus in urban Punjab is on the rise and the number of diabetics is increasing year after year. Experts are of the opinion that sedentary lifestyles and eating habits are responsible for at least 50% of the increase in diabetes cases and large number of people around us are neither aware of the high-risk factors nor the fact that they are diabetic. Yet research into health knowledge and practices around diabetes causation and prevention among the general community is lacking. Nurses need to be aware and sensitive to all these possibilities. They can educate women to know about diabetes mellitus and unhealthy practices in their daily lives. Hence the researcher felt the need to undertake the study to assess the practices of women regarding diabetes mellitus and to provide guidelines to enhance their knowledge and healthy practices among the women.

- **Research Problem:**

“An exploratory study to assess the practices of women regarding diabetes mellitus in selected urban areas of Ludhiana, Punjab.”

- **Aim of the study:**

To assess the practices of women regarding diabetes mellitus with a view to develop guidelines based on the findings of the study.

- **Objectives**

1. T
o assess the practices of women regarding diabetes mellitus.
2. T
o identify the relationship between practices of women regarding diabetes mellitus with selected variables: age, education, occupation, dietary pattern, family income & family history of diabetes mellitus.

3.

o find out the deficit areas and develop guidelines regarding healthy practices of diabetes mellitus.

- ***Operational definitions***

Practices: Refers to the activities or measures carried out by women in relation to prevent diabetes mellitus such as eating healthy foods, exercise performed, and regular health checkups.

Women: Refers to women who are not diagnosed with diabetes mellitus and residing in selected urban areas between the age group of 30-60 years.

Diabetes Mellitus: Diabetes mellitus is a disorder characterized by persistently elevated blood glucose levels than normal with the signs and symptoms of excess urination, excess hunger and excess thirst etc.

- ***Assumption***

The women do have healthy practices regarding diabetes mellitus.

- ***Delimitations***

The study was limited to:

1. Women who were not diagnosed with diabetes mellitus.
2. Women who were available at the time of data collection.
3. Women who were between the age group 30-60 years.

- ***Conceptual Framework***

Conceptual framework deals with interrelated concepts that assembled together in some rational scheme by virtue of their relevance to a common theme. The conceptual framework of the present study is based on the “Three Phase Theory” described by Fitts and Posner (1967). This theory suggests that three phases characterize the performance of task, which overlaps continuously (Fitts P M & Posner MI, 1967)²⁸.

These are defined as follows:-

The Cognitive Phase:

Fitts and Posner (1967) suggested that the learning process is sequential and move through specific phases and in the identification and development of the component of the knowledge & skills which involves formation of a mental picture of the skill. It is the understanding what to do. It would be

extremely difficult for someone to learn a skill without receiving any prior knowledge about the skill, whether that knowledge is visual or verbal. During the cognitive stage, an individual may have a general idea of the movement required for a task but might not be sure how to execute that movement and with a large number of errors.

In the present study, it was assumed that women would have healthy practices regarding prevention of diabetes mellitus. It was gained through the formal as well as informal education, perceive through seeing, hearing and handling. The practices of women was affected by various factors such as age, occupation, education, family income, dietary pattern and family history of diabetes mellitus.

The Associative Phase:

Associative stage is learning how to perform the skill. In this stage, the skills become more refined with practice, resulting in greater consistency of performance and fewer errors. The therapist provides less guidance during this stage and allows the individual to make error so that he/she can learn to adjust subsequent movements independently.

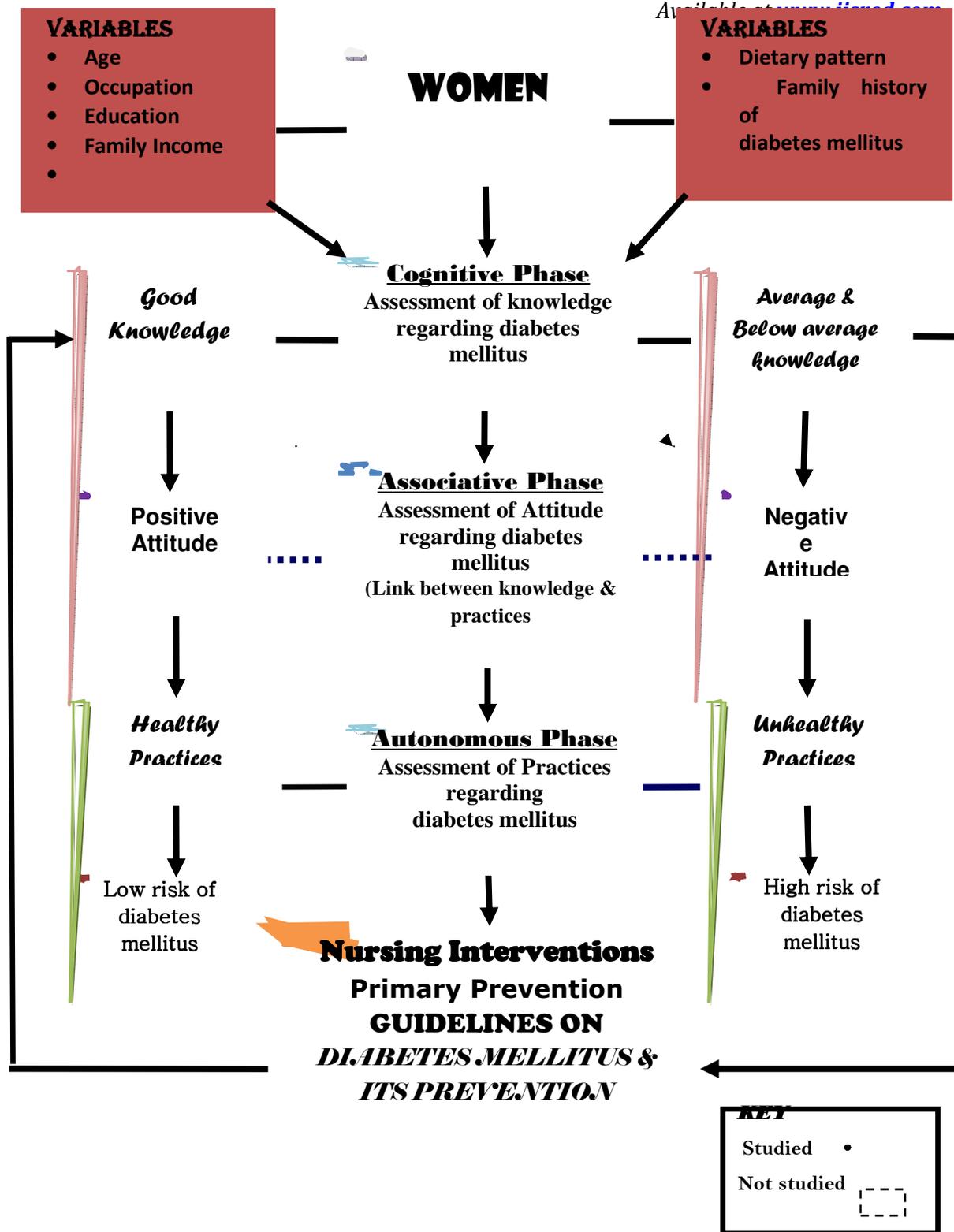


Fig. 1 Modified Conceptual Framework Based on Three Phase Theory of Task Performance (Fitts & Posner 1967)

CHAPTER - II

REVIEW OF LITERATURE

A study was conducted by Finnish Diabetes Prevention Research on 522 middle-aged, overweight subjects with impaired glucose tolerance who were randomized to either a usual case control group or an intensive lifestyle intervention group. Simple lifestyle modifications, such as a healthy diet that includes reducing sugar intake, are considered to be essential for the prevention and control of incident diabetes mellitus. The result shows that intensive lifestyle intervention produced long-term beneficial changes in diet, physical activity, and clinical and biochemical parameters and reduced diabetes **(Lindstrom J, Anne L, Mannelin M, Rastas M, Salminen V & Eriksson J et al, 2002)⁴⁷**.

A cross sectional study was conducted on 100 adult males to explore the knowledge about diabetes mellitus in Lahore. Only 40% could define diabetes mellitus, lack of physical activity, card playing and television was observed in 60% participants while 30% were overweight, 70% were having meals and snacks outside home, 75 % of the Diabetics were ≥ 40 years of age, 70 % were having positive family history, previously known Diabetics 10% whereas newly diagnosed cases were 22 % and twenty five percent 25% were smokers. Higher education was found to be significantly associated with the awareness of the Diabetes Mellitus. No significant association was seen between age and ability to define Diabetes Mellitus. Emphasis on health education and use of electronic and print media is recommended to improve the public awareness about the risk factors and consequences of diabetes mellitus **(Khan RM, Tariq SC, Maaz A & Alam Pasha MM, 2008)⁴⁸**.

The researcher found that diabetes mellitus is a potentially preventable disease if its risk factors are identified early and avoided. Lifestyle interventions (e.g. physical activity, weight loss) have proven to be more effective than medicine in preventing or delaying the onset of DM in persons at high risk of developing the disease. Learning about DM risk factors and preventive measures is the first step in prevention, since it will enable the public to make the informed decision of adopting a healthy **(Aljoudi SA & Taha ZA, 2009)⁴⁹**. The study was done by Chennai Urban Rural Epidemiology Study using systematic sampling method on a 2600 individuals of Chennai. Of the total individuals, only 75.5% of the whole population reported that they knew about diabetes or conversely nearly 25% of the

Chennai population was unaware of diabetes but knowledge of the role of obesity and physical inactivity in producing diabetes was very low, with only 11.9% of study subjects reporting these as risk factors for diabetes. Even among the self-reported diabetic subjects, only 40.6% were aware that diabetes could produce some complications. So awareness and knowledge regarding diabetes is still grossly inadequate in India and diabetes education programmes are urgently needed both in urban and rural India (Mohan D, Sandeep S, Deepa R, Shah B & Varghese C, 2007)⁵⁰.

A new study suggested that, in postmenopausal women, the women who did both diet and exercise together had the greatest weight loss and greatest improvement in insulin and blood sugar control”, 439 inactive, overweight were told not to change their eating or exercise patterns. Increased insulin resistance and elevated blood sugar are signs that the risk of diabetes is high and improved significantly with diet and a bit more in the diet-plus-exercise group, but not with exercise alone, compared to women who made no changes. Women in the diet group lost an average of 8.5 % of their initial body weight, while those who had diet plus exercise lost more than 10%. Compared to a healthy weight person, an overweight individual is 3 times more likely to develop diabetes within 10 years (Thomas F, 2011)⁵¹.

The study was done to evaluate a 7-month community-based non pharmacological lifestyle intervention to prevent/reduce the risk of developing diabetes and its complications in Tamilnadu with total of 703 village inhabitants, comprising adults and youth aged 10–92 years, were provided health education messages addressed diet, physical activity, and knowledge improvement to see the prevalence of diabetes and the effectiveness of the intervention were assessed using selected parameters. The crude prevalence of diabetes and pre-diabetes among adults were 5.1 and 13.5%, respectively, while the prevalence of pre-diabetes in youth aged 10–17 years was 5.1%. Intervention reduced fasting blood glucose levels of pre-diabetic adults by 11%, pre-diabetic youth by 17%, and type 2 diabetic adults by 25%. Improvements in obesity parameters and dietary intake also occurred. (Balgopala P, Kamamma N, Thakor GP & Misra R, 2008)⁵².

Various studies depicts that frequent exercise can help to prevent diabetes in women. Among people aged 25-44, women with diabetes die at a rate three times higher than women without diabetes. In 2011, 9 million women in the U.S. had type 2 diabetes, making the disease a significant public health

concern. Women with diabetes have higher mortality rates, increased risk of heart disease, more vision problems and increased risk for pregnancy complications. It is important for women to prevent diabetes by making diet, exercise and lifestyle changes (**Mayo Clinic Com, 2012**)⁵³. A prospective cohort studies and randomized clinical trials have been demonstrated that type 2 diabetes can be prevented largely through moderate diet and lifestyle modifications. Excess adiposity is the most important risk factor for diabetes, and thus, maintaining a healthy body weight and avoiding weight gain during adulthood is the cornerstone of diabetes prevention. Increasing physical activity and reducing sedentary behaviors such as prolonged TV watching are important both for maintaining body weight and improving insulin sensitivity (**Schuzle MB & Hu FB, 2005**)⁵⁴.

The third National Health and Nutrition Examination Survey, was done to evaluate the prevalence and time trends for diagnosed and undiagnosed diabetes, impaired fasting glucose, and impaired glucose tolerance among sample of 18,825 U.S. adults ≥ 20 years of age who were interviewed to ascertain a medical history of diagnosed diabetes, a subsample of 6,587 adults for whom fasting plasma glucose values were obtained, and a subsample of 2,844 adults between 40 and 74 years of age who received an oral glucose tolerance test. Based on American Diabetes Association criteria, prevalence of diabetes (diagnosed plus undiagnosed) in the total population of people who were 40–74 years of age increased from 8.9% in the period 1976–1980 to 12.3% by 1988–1994. The high rates of abnormal fasting and post challenge glucose found together with the increasing frequency of obesity and sedentary lifestyles in the population, make it likely that diabetes will continue to be a major health problem in the U.S. (**Maureen I Harris, Catherine C, Mark SE, David EG & Randie RL et al, 1988**)⁵⁵.

The cross sectional survey was done among the employees of Bhilai steel plant to study the knowledge about diabetes mellitus and its preventive practices (physical activities, dietary, smoking and alcohol habits) with 213 subjects, 135 (63.4%) were males and 78 (36.6%) were females. The knowledge of respondents varied from 59% to 78.2% on various aspects of diabetes, except that type 2 diabetes was the commonest type (20.8%), predisposition to skin and genital infections (25.5%), lack of exercises can lead to diabetes (48.6). The knowledge about preventive practices also ranged from 51.6% to 80.8%, excepting the need to control weight and avoid smoking/alcohol. The overall knowledge about type 2 diabetes mellitus and preventive practices were average and actual life style practices were poor

and it need to be improved by awareness programmes (Behera KS, Behra RR & Thakur H et al, 2012)⁵⁶.

There is convincing evidence that diets rich in whole grains protect against diabetes, whereas diets rich in refined carbohydrates lead to increased risk. In the Nurses' Health Studies I and II, for example, researchers looked at the whole grain consumption of more than 160,000 women whose health and dietary habits were followed for up to 18 years. Women who averaged two to three servings of whole grains a day were 30 percent less likely to have developed type 2 diabetes than those who rarely ate whole grains. When the researchers combined these results with those of several other large studies, they found that eating an extra 2 servings of whole grains a day decreased the risk of type 2 diabetes by 21 percent (de MJ, Hu FB, Spiegelman D, Franz M & Van DR, 2007)⁵⁷.

Despite the fact that the cause of DM is unknown, many of its modifiable lifestyle-related risk factors have been identified and studied. The accumulating evidence suggests that DM is a potentially preventable disease if its risk factors are identified early and avoided. Lifestyle interventions (e.g. physical activity, weight loss) have proven to be more effective than medicine in preventing or delaying the onset of DM in persons at high risk of developing the disease (Gillies C, Abrams K, Lambert P, Cooper N, Sutton A & Hsu R et al, 2007)⁵⁸. According to Healthy People, provides a framework for a comprehensive program to address the problems of poor nutrition and physical inactivity on a state or community level. About 75% of Americans do not eat enough fruit, more than half do not eat enough vegetables, and 64% consume too much saturated fat. Low fruit and vegetable consumption and high saturated fat intake are associated with coronary heart disease, some cancers, and diabetes. This chapter provides a framework for a comprehensive program to address the problems of poor nutrition and physical inactivity on a state or community level. State public health authorities are in a unique position to strengthen and coordinate efforts to improve nutrition and physical activity among Americans (Carol A M, 2010)⁵⁹.

The controlled studies shown that increasing carbohydrate to the recommended level, by increasing the intake of foods high in soluble fiber (legumes, lentils, some fruits, oats and barley), digestion is much slower and have lower GI values. An intake of 40 g per day of dietary fiber is ideal. Such foods can also produce an appreciable improvement in glycaemic control and a reduction in LDL-cholesterol,

without an increase in triglycerides or a reduction in the ratio of HDL to LDL (**Jenkins DJA, Wolever TM, & Taylor RH, 1981**)⁶⁰.

The cross sectional survey was done on 1769 rural (894 men, 875 women) and 1806 urban subjects (904 men, 902 women) between 25–64 years of age to compare the prevalence of type 2 diabetes mellitus and coronary artery disease and hypertension in diabetes mellitus in north India. The study showed that there were prevalence of diabetes mellitus (6.0 vs 2.8%) hypertension (24.0 vs 17.0%) and CAD (9.0 vs 3.2%) was significantly ($P < 0.001$) higher in urban compared to rural subjects. Hypertension and CAD were significantly more frequent among subjects with diabetes compared to non diabetes. The association of CAD and hypertension with diabetes was greater in urban than rural subjects. Excess body weight and obesity, central obesity, sedentary lifestyle, higher visible fat intake (>25 g/day), and social class 1–3 (higher and middle) were significantly associated with diabetes. The findings suggest that higher body mass index, waist–hip ratio and visible fat intake and sedentary lifestyle were risk factors of diabetes (**Bajaj S, Niaz A, Rastogi SS, Moshiri M, 1998**)⁶¹.

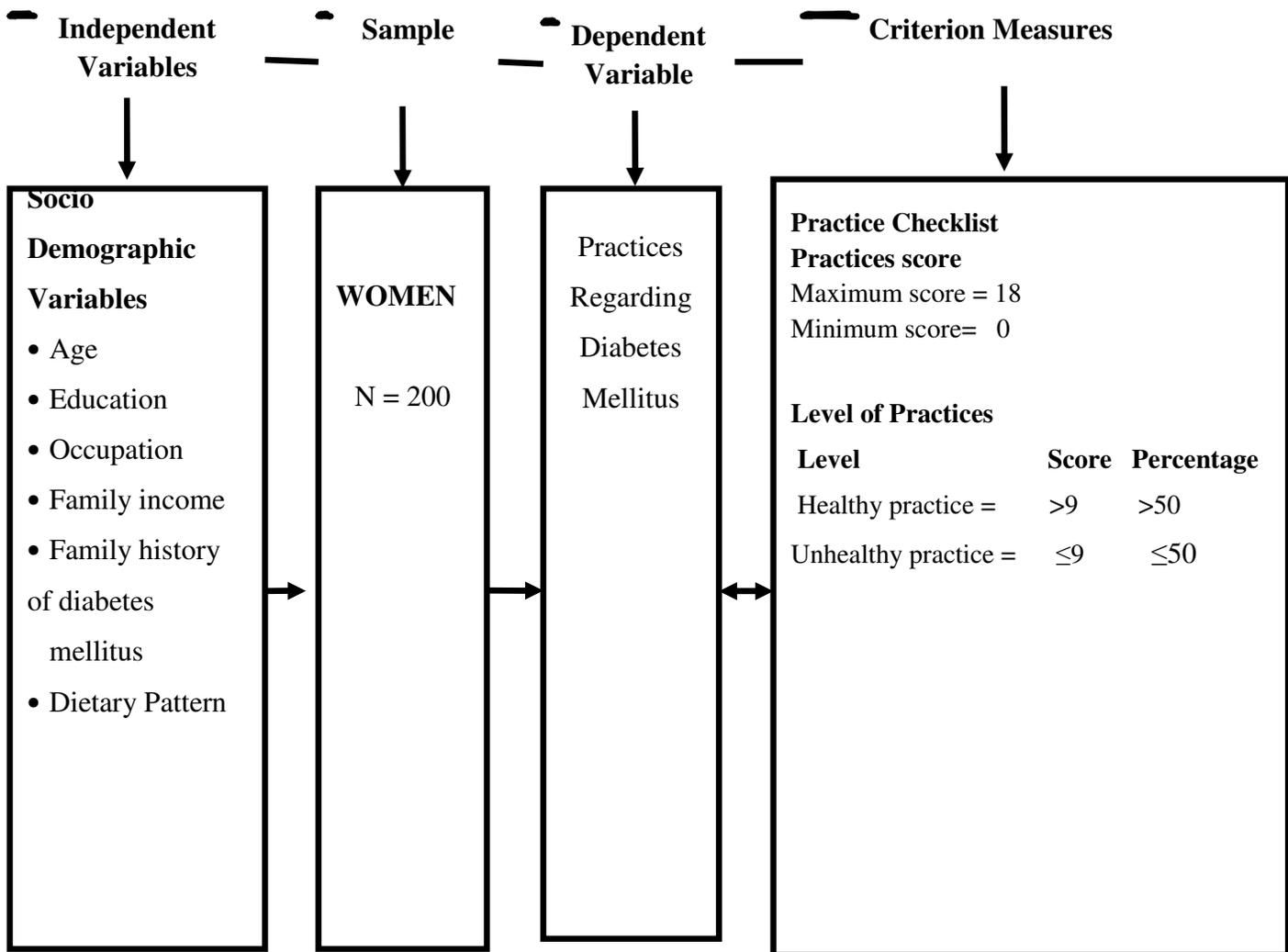
The cohort study was done on 84,941 female nurses from 1980 to 1996 to assess the risk of diabetes 2 in women. Information about their diet and lifestyle was updated periodically. During 16 years of follow-up, it was documented 3300 new cases of type 2 diabetes. Overweight or obesity was the single most important predictor of diabetes. Lack of exercise, a poor diet, current smoking, and abstinence from alcohol use were all associated with a significantly increased risk of diabetes, even after adjustment for the body-mass index. As compared with the rest of the cohort, women in the low-risk group (3.4 percent of the women) had a relative risk of diabetes of 0.09 (95 percent confidence interval, 0.05 to 0.17) (**Frank BH, Joann EM, Stampfer MJ, Colditz G, Liu S & Solomon CG et al, 2001**)⁶². The research carried out in randomized 522 middle-aged, overweight patients with impaired glucose tolerance (IGT) to intensive lifestyle modification or usual care. The lifestyle intervention involved both dietary change and increased physical activity. It was associated with a 58% reduction in the risk of progression to diabetes over an average of 3.2 years' follow-up (**Dinneen SF & Semple RK, 2004**)⁹.

The study was done to evaluate the influence of physical activity and stress factors on the development of diabetes mellitus (DM). One hundred and eighty-seven adult subjects (M:F 112:75), registered in the primary prevention of diabetes programme for 2 or more years were studied prospectively. Dietary modifications and regular exercise programme were advised. Study subjects were reviewed during

August 1997 to October 1998 and it was found that 100 (53.5%) had NGT, and 87 (46.5%) had developed diabetes (DM). They showed lower dietary adherence ($P = 0.042$) and scores on mental stress was higher than in NGT group ($P < 0.001$). After controlling for age, gender and the initial 2 h plasma glucose, non-adherence to exercise and high scores of psychological stress showed strong association with diabetes. So there was significant and independent roles of physical inactivity and psychological stress factors are demonstrated in the development of diabetes. (**Ramachandran A, Snehalatha C, Shobana R, Vidyavathi P Vijay V et al, 2004**)³⁸.

METHODOLOGY

- Research approach & Research design
- Research setting
- Target population
- Sample and Sampling techniques
- Inclusion and Exclusion criteria
- Selection & Development of the tool
- Description of the tool
- Validity of the tool
- Reliability of the tool
- Pilot study
- Data collection procedure
- Ethical considerations
- Summary
- Plan of the data analysis



RESEARCH DESIGN

- ***Research design and Research approach***

The research design refers to the plan and organization of scientific investigation for conducting the study and spells out the strategies the researcher adopt to develop information that is accurate, objective and meaningful. A well conceived and properly executed research design enhances the researcher's confidence in the research project. For the present study, non experimental research design is used to accomplish the stated objectives. This design is suitable as it explores without any manipulation of the variables or control over the research setting/situation.

The research approach indicates the basic procedure for conducting the research. An exploratory research approach was considered to be appropriate keeping in view the nature of problem and to accomplish the objectives of the study. Based on the objectives of study, exploratory research approach is used to assess the practices of women regarding diabetes mellitus in selected urban areas of Ludhiana, Punjab

Independent variables - Age, education, occupation, family income, dietary pattern, family history of diabetes mellitus.

Dependent variables – Practices of women regarding diabetes mellitus

- ***Research setting***

The study was conducted in New Shivaji and Mohar Singh Nagar, urban areas of Ludhiana, Punjab with total population of 2270 and 1865 respectively. These areas were under the Family Planning Department, Christian Medical College and Hospital, Ludhiana. Mohar Singh Nagar was situated within the distance of approximately 200 meters from Christian Medical College and Hospital, Ludhiana, Punjab. Christian Medical College and Hospital Ludhiana is one of the pioneers of Nursing Education Institute in the state. Over the years it has grown in every sphere and renders services in all specialization having 720 bed capacities. This hospital provides preventive, promotive, curative and rehabilitative services. New Shivaji Nagar area was situated within the distance of approximately 400 mts from Christian Medical College and Hospital, Ludhiana, Punjab.

Mohar Singh Nagar area hosts migrants from Pakistan during partition. Women were also in service but most of the women were housewives. There was also a Church situated in this area. New Shivaji Nagar, where the people were also migrants from other states like UP, Bihar, Utrakhnad, Himachel

Pardesh, Nepal and lived in rented houses. Most of the families had their own business and large numbers of women were housewives. There was also Mandir and Gurudawara situated in this area. Both the colonies have facilities such as underground drainage system and supply of chlorinated water. Various facilities are available in these areas include electricity supply, market, primary schools and a nursing home. The health services provided by CMC Hospital, family planning department through regular home visits and referrals by the ANM staffs and other health care personnel. They visit both the areas to assess the health needs, maintain the records, provide health education and give referrals. The investigator had selected the above areas since these are the field practice areas during community posting as well as the convenience of the investigator.

- ***Target Population***

According to **Polit and Hungler (2000)**, the population refers to the entire aggregation of cases that meets a designated set of criteria. The target study population to whom the findings would be generalized consisted of women who were between age group of 30-60 years residing in Mohar Singh and New Shivaji Nagar, urban areas of Ludhiana, Punjab.

- ***Sample and Sampling technique***

Sampling refers to the process of selecting a portion of the population to represent the entire population. The sample size of the study consisted of 200 women residing in Mohar Singh and New Shivaji Nagar areas of Ludhiana. The investigator selected the sample by using purposive sampling technique.

- ***Inclusion and Exclusion criteria***

Inclusion Criteria

- Women who were living in selected urban areas of Ludhiana.
- Women who were willing to participate in the study.

Exclusion Criteria

- Women who were above 60 years of age.
- Women who were not diagnosed with diabetes mellitus.

- ***Selection and Development of the tool***

The structured interview checklist was used to assess the practices of women regarding diabetes mellitus. Preliminary draft of the tool was prepared following extensive review of literature, articles, books, journals and internet related and expert's opinion by the professionals and suggestions of the research panel by the Community Health, Medical and Surgical, Obstetrics and Gynecological nursing and experience of the investigator during home visits, through mass media gave an insight into the problems regarding diabetes mellitus & how women need to understand it. Tool was translated in Hindi. Informal discussion was done with women regarding diabetes mellitus during home visits. Check list was used to assess the practices of women regarding diabetes mellitus.

- ***Description of the tool***

A checklist was used to assess the practices of women regarding diabetes mellitus residing in Mohar Singh Nagar and New Shivaji Nagar, Ludhiana.

Data collection tool has three parts

Part 1: Socio Demographic Data

Part 2: Structured interview checklist to assess the Practices

Part 1: Socio Demographic Data

This part of tool was for obtaining base line data of research women on socio demographic variables i.e. age, education, occupation, dietary pattern, family income & family history of diabetes mellitus.

Section 2: Structured Interview Checklist to assess the Practices

This part consisting of structured interview checklist to assess the practices of women regarding diabetes mellitus. It consists of 18 items, each statement developed for subjects to respond on two points 'Yes' and 'No'. Two options were given in front of the statement and the respondent had to select the appropriate response. Answer 'Yes' carried 1 score and 'No' carried 0 score, the scoring was reversed in case of negative items. The scores were computed as maximum score of 22 and minimum score of 0.

Positive items: 4, 6, 9, 11, 12, 13, 14, 16

Negative items: 1, 2, 3, 5, 7, 8, 10, 15, 17, 18

Areas of practices regarding diabetes mellitus:

Areas of Practice	Items
Physical Activities	04 (1, 2, 3, 4)
Eating Habits	06 (5, 6, 7, 8, 9, 10)
Health Check up	04 (11, 12, 13, 14)
Stress	02 (15, 16)
Risk Behavior	02 (17, 18)

Total items – 18

Maximum score – 18

Minimum score – 0

Criterion Measure

The practice level is divided in two levels:

Levels of Practice	Score	Percentage
Healthy practices	>9	>50
Unhealthy practices	≤9	≤50

- ***Validity of tool***

Content validity of the tool was confirmed by experts ‘opinion for the relevance of the items. These experts were from different specialties i.e. Obstetric and Gynecological Nursing, Pediatrics Nursing, Medical Surgical Nursing, Community Health Nursing, Psychiatric Nursing and Department of Mental Health (Psychiatry) Nursing. Their valuable suggestions were obtained and incorporated. The experts were requested to give their valuable opinion and precious suggestions for the purpose of development of a better tool to conduct the study. Changes had been made and some items were added in prevention and physical activity area regarding diabetes mellitus. The language of the questions was modified according to their valuable suggestions.

- ***Reliability of tool***

Reliability was computed by Split half method i.e. by calculating coefficient of correlation first and then by applying Spearman Brown Prophecy formula. The reliability of structured interview checklist of women was 0.75. Hence, the tool was reliable.

- ***Pilot study***

Pilot study was conducted in third week of October, 2012 in Field Ganj area of Ludhiana, to find out the reliability of the tool and feasibility of the study. Prior permission to conduct the study was taken from Head of Community Medicine Department, CMC & Hospital, Ludhiana. The investigator collected the data by administering structured interview schedule checklist to assess the practices. The total sample size was 20. Participants were explained regarding the study and its purpose. The time taken by each subject was an average of 30-45 minutes. The sample chosen for pilot study were not considered for final study. A try out study was done for clarity, relevance and feasibility for conducting the study. Five questions were deleted because of inconvenience of the subjects and time taken with each subjects. According to the feedback given by them few modifications were done in the tool.

- ***Data collection procedure***

Data collection for the study was carried out in the month of Dec. 2012. Prior to data collection procedure the formal permission was obtained from Head of Family Planning Department. Structured Interview checklist was used as the method of data collection The checklist was translated in Hindi and English language by the experts. The first six days of data collection were utilized for survey of the target population. During survey the investigator searched out for women who are between age group 30-60 years and not diagnosed with diabetes. Women who were fulfilling the criteria were located and women who refused in study were not interviewed and in that case next sample was interviewed. . There were nearly 166 women in New Shivaji Nagar, out of which 36 refused to participate in the study and 16 found to be locked which had to be visited again The total 114 women were selected as sample from this area. In Mohar Singh Nagar, total women were 143, out of which 44 refused to participate in the study and 13 houses were locked and who had to be visited again. The total 86 women were taken for sample in this area. Due to an ongoing cancer survey in both areas, many of the women refused to participate in the study. So total 200 women were taken from the target population were interviewed. Investigator gave self introduction to women and explained the purpose of gathering information before assessment of practices. Before interviewing them, verbal consent was taken from women regarding their participation in the study. They were assured that their responses will be kept confidential and used only for research purpose. The time taken by each respondent for responding to structured interview schedule and checklist items was 35-45 minutes. The investigator faced difficulties

during data collection as most of women refused to participate in the study due to their routine work schedule and ongoing cancer survey in these areas.

- ***Ethical Consideration***

With the view of ethical consideration, the researcher discussed the type and purpose of the study with the Head of Family Planning Department. Also the women were explained about the purpose of the study and verbal consent was taken from them for their participation in the study. Women were reassured that the information given by them will be kept confidential and will be used only for research.

- ***Summary***

This chapter dealt with the description of research approach, research design, selection and description of the field of study, sampling and sampling technique, development and description of tool, validity of tool, reliability of tool, pilot study, data collection procedure, ethical consideration, research setting, target population, exclusion criteria and inclusion criteria.

- ***Plan of data Analysis***

Analysis of the data was done in accordance with the objectives. It was done by using descriptive and inferential statistics such as calculating the percentage, mean, mean percentage, standard deviation, ANOVA and t test was used to identify the significant relationship of knowledge and practices of Women with selected variables. Bar diagrams & pie diagram were used to depict the findings. The level of significance chosen was $p < 0.05$ level and $p < 0.01$ level.

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATA

- ***Organisation of data***

The raw data was organized and analyzed and interpreted using descriptive and inferential statistics. The data was organized and presented under the following sections:-

SECTION- I
SOCIO DEMOGRAPHIC CHARACTERISTICS OF SAMPLE

TABLE: I
Percentage Distribution of Women According to Demographic Characteristics

N = 200

Demographic Characteristics	N	%
Age (in years)		
a) 30-40	62	31
b) 41-50	65	32.50
c) 51-60	73	36.50
Family Income (Rs./month)		
a) ≤5000	85	42.50
b) 5001-10000	43	21.50
c) 10001-15000	59	29.50
d) >15000	13	6.50
Family history of diabetes mellitus		
a) Yes	68	34
b) No	132	66
Dietary Pattern		
a) Vegetarian	113	56.50
b) Non-Vegetarian	72	36
c) Eggetarian	15	7.50
Education		
a) Illiterate	19	9.50
b) Primary/Middle	64	32
c) Matric/10+2	71	35.50
d) Graduate & above	46	23
	128	

Occupation

a) Housewife		64.50
b) Self-employed	23	11.50
c) Service	49	24.50

Table 1 depicts that women were distributed into various categories according to age, family income, education, occupation, family history of diabetes mellitus & dietary pattern. According to age, maximum number of women 36.50% were in the age group of 51-60 years, followed by 32.50% women in the age group 41-50 years and least 31% in the age group 30-40 years. According to family income (Rs. month), maximum of women 42.50% had family income of Rs. ≤ 5000 , followed by 29.50% of women had family income of Rs. 10,001-15000, 21.50% who had family income Rs.5001-10001 and 6.50% had family income Rs. > 15000 . According to family history of diabetes mellitus, maximum number of women 66% had no family history of diabetes mellitus, followed 34% women had family history of diabetes mellitus. According to dietary pattern, majority of women 56.50% were vegetarians, followed by women 36% were non vegetarian and 17.50% eggetarian. According to education, maximum number of women 35.50% were educated up to Matric/10+2, followed by women 32% who were educated up to primary/middle, 23% were graduate and 9.50% were illiterate. According to occupation, majority of women 64.50% were housewife, 24.50% women were in service, followed by 11.50% who were self employed.

Hence, it was concluded that majority of women were in the age group of 51-60, and family income was ≤ 5000 , with no family history of diabetes mellitus. Majority of women were vegetarian and were educated up to matric/10+2 and were housewives.

SECTION-II

Objective 4 (b): To identify relationship between practices of women regarding diabetes mellitus with selected variables: age, education, occupation, dietary pattern, family income, family history of diabetes mellitus.

TABLE: 13
Mean, Standard Deviation and Analysis of Variance of Practice Score of Women regarding Diabetes Mellitus according to Age (in years)

		N=200		
Age (in years)	n	Practice Score		
		Mean	SD	
a) 30-40	62	9.11	2.66	
b) c) 41-50	65	9.40	2.73	
d) e) 51-60	73	9.25	2.02	
Sources of variation	df	Sum of squares	Mean sum of squares	F
Between the group	2.624	2	1.321	
Within the group	1205.37	197	6.119	0.214 ^{NS}
Total	1207.99	199		

Maximum Score =22

NS Non-Significant

Minimum Score = 0

Table 13 depict that the mean practice score of women regarding diabetes mellitus according to age. It showed that the mean practice score was the highest 9.40 in women who were in the age group between 41-50 and least in women 9.11 who were in age group of 30-40 years.

The tabled F value for 2/197 degree of freedom was 2.99 at p<0.05 level of significance and calculated F value was 0.214. The calculated F value was less than the tabled value. Therefore, the difference was found statistically non-significant.

Hence, it was inferred that age had no significant impact on practices of women regarding diabetes mellitus.

TABLE: 14 (a)

Analysis of Variance of Practice Score of Women regarding Diabetes Mellitus according to Education

N=200

Sources of variation	df	Sum of Squares	Mean sum of squares	F
Between the group	146.527	3	48.842	
Within the group	1061.468	196	5.416	9.019**
Total	1207.995	199		

Maximum Score=18

****Significant at $p < 0.01$**

Minimum Score=0

Table 14 (a) depict that the calculated F value was 9.019 and tabled F value for 3/196 degree of freedom was 3.78 at $p < 0.01$ level of significance. The calculated value was more than the tabled value. The difference was found statistically significant.

Therefore further analysis was done by using t test to find the significant differences and findings are given in the next table i.e. 14 (b)

TABLE: 14 (b)

Mean and Standard Deviation of Practice Score of Women regarding Diabetes Mellitus according to Education

N==200			
Practice Score			
Education	n	Mean	SD
a) Illiterate	19	9	3.496
b) Primary/Middle	64	9.61	2.06
c) Matric	71	8.64	2.128
d) Graduate & above	46	10.43	2.391
		df	t
	a&b	81	0.72 ^{NS}
	a&c	88	1.23 ^{NS}
	a&d	63	1.64 ^{NS}
	b&c	133	1.65 ^{NS}
	b&d	108	1.87 ^{NS}
	c&d	115	5.062*

Maximum Score = 18

***Significant at p< 0.05 level**

Minimum Score = 0

NS Non Significant

Table 14 (b) & fig. 12 depicts the mean practice score of women regarding diabetes mellitus according to education. The mean practice score was highest 10.43 in the women who were graduate and least 8.64 in those women who were educated up to matric. The difference was statistically tested and found to be significant at p<0.05 level.

Therefore, it was concluded that there was significant relationship between women who were educated up to matric and graduate and above.

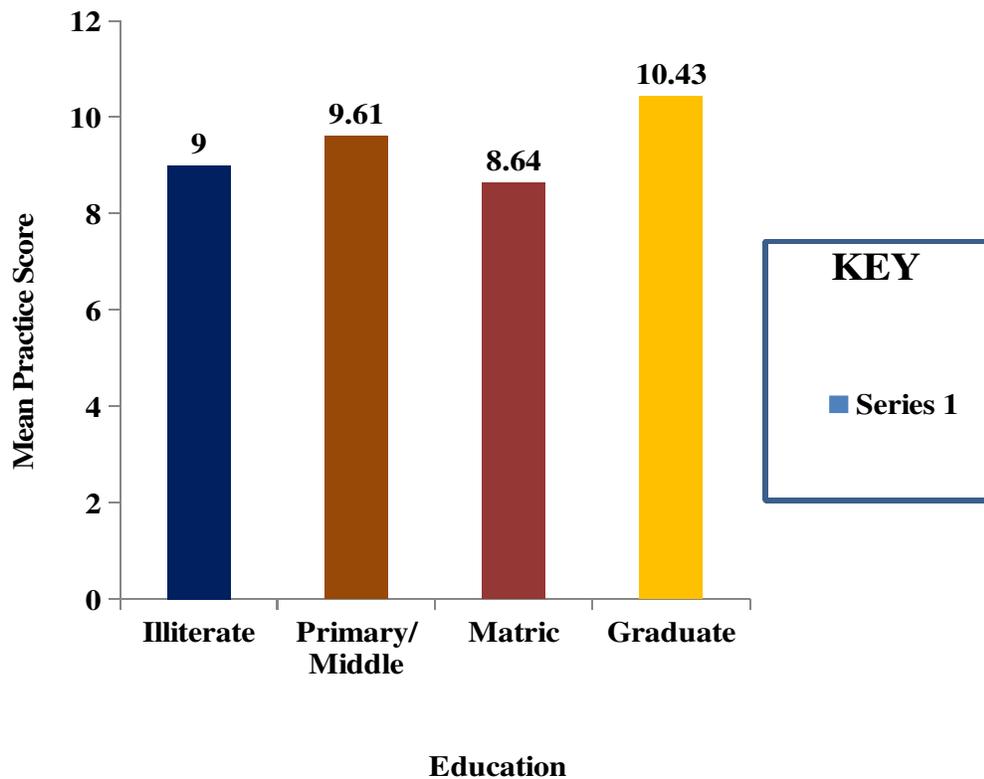


TABLE: 15

Mean and Standard Deviation of Practice Score of Women regarding Diabetes Mellitus according to Family history of Diabetes Mellitus

N=200

Family History of Diabetes Mellitus	n	Practice Score		df	t
		Mean	SD		
Yes	68	9.38	1.924	198	0.524 ^{NS}
No	132	9.19	2.705		

Maximum Score = 18

NS Non significant

Minimum Score = 0

Table 15 and fig. 13 depicts that the mean practice score was highest 9.38 in the women who had family history of diabetes mellitus and lowest 9.19 in the women who had no family history of diabetes mellitus. The difference in mean score was found not statistically significant at $p < 0.05$ level of significance.

Therefore, it was concluded that the family history of diabetes mellitus had no impact on practices regarding diabetes mellitus.

TABLE: 16

Mean and Standard Deviation and Analysis of Variance of Practice Score of Women regarding Diabetes Mellitus according to Occupation

		N=200		
Occupation	n	Practice Score		
		Mean	SD	
a) Housewife	128	9.13	2.356	
b) Service	23	9.26	3.467	
c) Self-employed	49	9.57	2.198	
Sources of Variation	Sum of squares	Mean sum of squares	df	F
Between the group	6.818	3.409	3	
Within the group	1201.177	6.097	196	0.559 ^{NS}
Total			199	

Maximum Score = 18
Minimum Score = 0

NS Non Significant

Table 16 depict that the mean practice score was highest 9.57 in the women who were self employed and lowest 9.13 in those who were housewives.

The calculated F value was 0.559 and tabled F value for 3/196 degree of freedom was 3.78 at $p < 0.05$ level of significance. The calculated F value was less than the tabled value. Therefore, the difference was found statistically non significant.

Hence, it was inferred that occupation had no significant impact on practices of women regarding diabetes mellitus.

Table: 17(a)

Analysis of Variance of Practice Score of Women regarding Diabetes Mellitus according to Dietary pattern

N=200

Sources of variation	Sum of squares	Mean sum of squares	df	F
Between the group	36.334	18.167	2	
Within the group	1171.661	5.948	197	3.055*
Total	1207.995		199	

***Significant at $p < 0.05$ level**

Table 17 (a) depicts the calculated F value was 3.055 and tabled F value for 2/197 degree of freedom was 2.99 at $p < 0.05$ level of significance. The calculated F value was more than the tabulated F value. The difference was found statistically significant.

Therefore further analysis was done using t test to find the significant differences and findings were given in the next table i.e. 17 (b).

TABLE: 17 (b)

Mean and Standard Deviation of Practice Score of Women regarding Diabetes Mellitus according to Dietary Pattern

Dietary Pattern	n	Practice Score	
		Mean	SD
a) Vegetarian	113	9.08	1.707
b) Non-Vegetarian	72	9.22	3.163
c) Eggetarian	15	10.73	3.105
		df	t
	a&b	184	0.17 ^{NS}
	a&c	126	2.03*
	b&c	86	1.73 ^{NS}

Maximum Score = 18

***Significant at p< 0.05 level**

Minimum Score = 0

Table 17 (b) and fig. 13 depicts that mean practice score of women regarding diabetes mellitus according to dietary pattern. It showed that mean practices score was highest 10.73 in between eggetarian and least 9.08 in those women who were vegetarian. The difference was statistically tested and found to be significant at p<0.05 level.

Thus, it was inferred that there was significant relationship between women who were vegetarian and eggetarian.

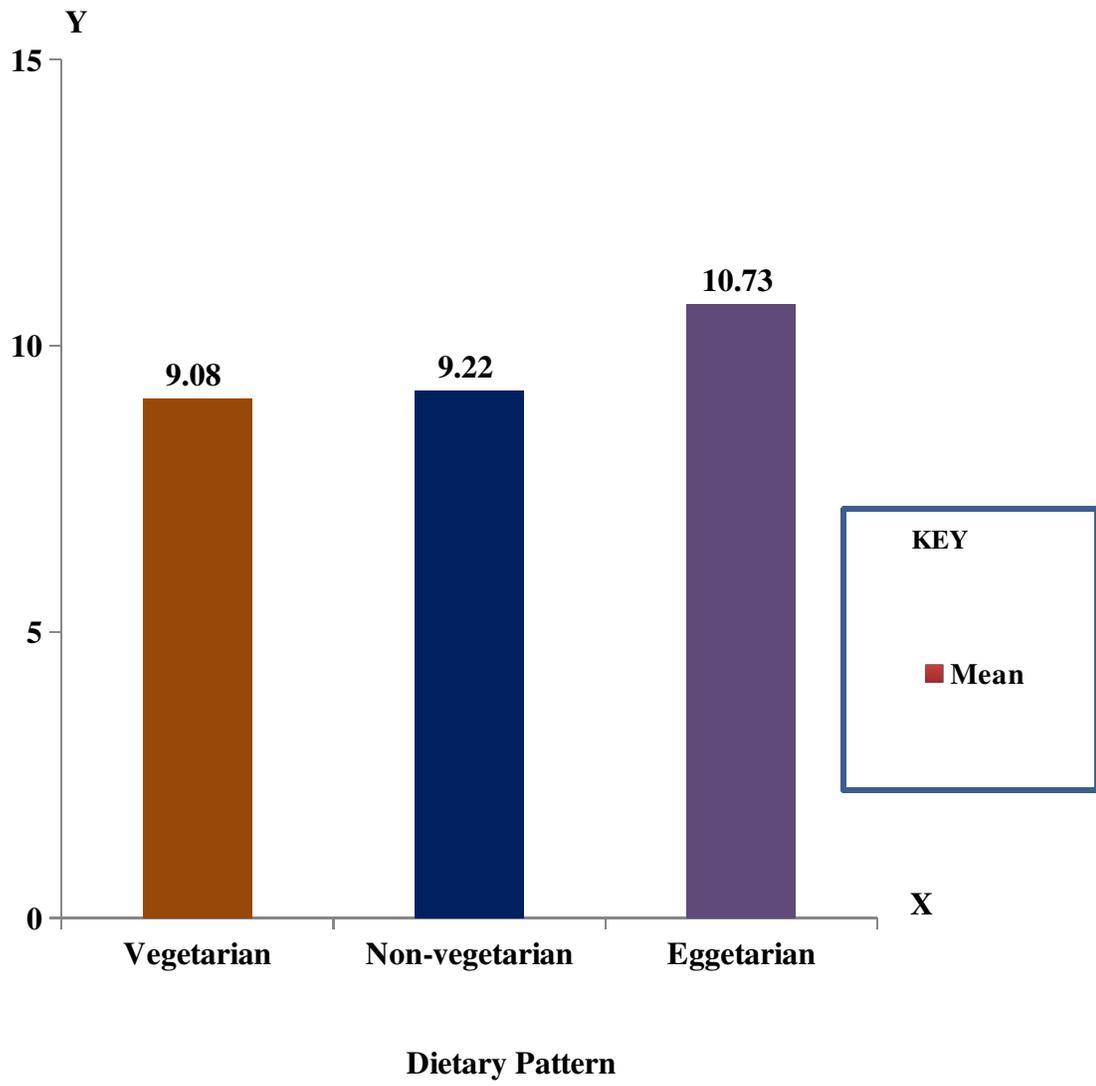


TABLE: 18 (a)

Analysis of Variance of Practices Score of Women regarding Diabetes Mellitus according to Family Income

N=200				
Source of variation	Sum of squares	Mean sum of squares	df	F
Between the group	63.399	21.133	3	
Within the group	1144.596	5.840	196	3.619*
Total	1207.995		199	

***Significant p< 0.05 level**

Table 18 (a) depict that the calculated F value was 3.619 and tabled F value for 3/196 degree of freedom was 2.60 at p<0.05 level of significance. The calculated F value was more than the tabled value. Therefore, the difference was found statistically significant.

Therefore further analysis was done by using t test to find significant differences and findings are given in the next table i.e. 18(b).

TABLE: 18 (b)

Mean and Standard Deviation of Practice Score of Women regarding Diabetes Mellitus according to Family Income

N=200

Family Income (Rs./month)	n	Practice Score	
		Mean	SD
i) ≤5000	85	9.35	1.624
o) 5001-10000	43	9.05	3.618
o) 10001-15000	59	9.69	2.087
i) >15000	13	7.31	3.172
		df	t
	a&b	126	0.52 ^{NS}
	a&c	142	1.05 ^{NS}
	a&d	96	3.57*
	b&c	100	1.04 ^{NS}
	b&d	54	1.67 ^{NS}
	c&d	70	2.31*

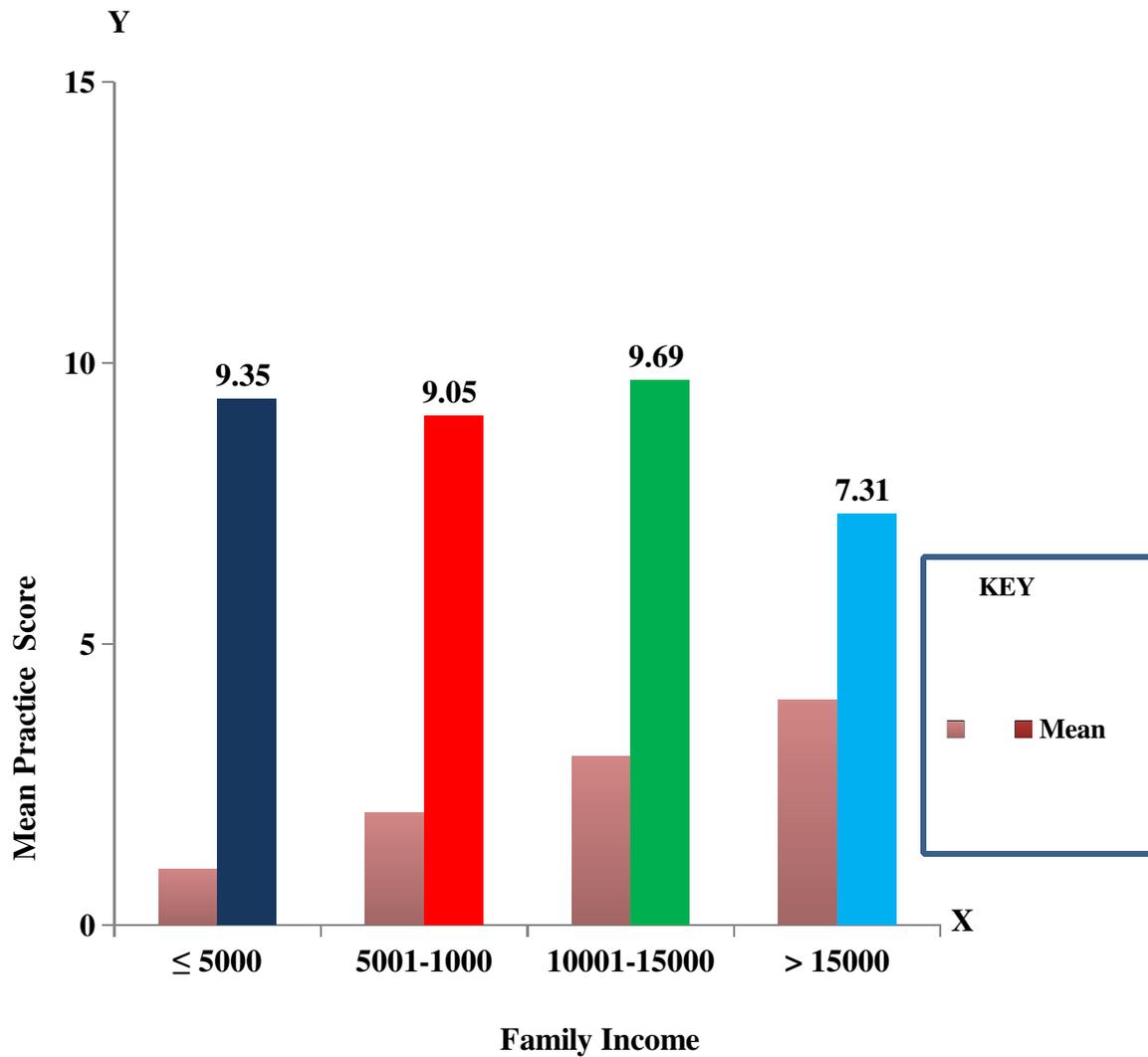
Maximum Score = 18

***Significant p< 0.05 level**

Minimum Score = 0

Table 18 (b) and fig. 14 depicts that mean practices score of women regarding diabetes mellitus according to family income. The mean practice score was highest 9.69 in women with family income of Rs.1000-15000 per month and least 7.31 in the women with income Rs. >15000 per month. The difference was statistically tested and found to be significant at p<0.05 level.

Therefore, it was concluded that family income had significant relationship between the women with income Rs. ≤5000 and Rs.>15000 per month and between income Rs.10001-15000 per month and Rs.>15000 per month with practices of women regarding diabetes mellitus.



SECTION-III

Objective 6: To find out deficit areas and develop guidelines to enhance the Practices of Women regarding Diabetes Mellitus.

TABLE: 20

Frequency and Percentage distribution of Women according to deficits in practice areas related to individual items related of Diabetes Mellitus

Item No	Areas of Practice	Women		
		n	%	Rank Order
N=200				
I	Physical activity			
1.	Depend on maids for most of your chores	86	43	3
2.	Use transport	133	66.50	2
3.	Watch T.V. for more than two hours a day	83	41.50	4
4.	Exercise regularly	170	85	1
II	Eating habits			
5.	Eat food from restaurant/Hotel in a week	70	35	4
6.	Eat regular salads & vegetables	101	50.50	3
7.	Eat red meat frequently	49	24.50	5
8.	Consume sweet dish more often	68	34	6
9.	Drink more than 8 glass of water	143	71.50	1
10.	Use cooking oil	116	58	2
III	Health checkup			
11.	Go for regular health check-up	144	72	1
12.	Check your weight often	126	63	3
13.	Check your blood pressure often	130	65	2
14.	Check your blood sugar often	144	72	1

IV Stress

15.	Easily gets upset at job/home	129	64.50	1
16.	Use any support system during stress	53	26.50	2

Women

Item no.	Areas of Practice	n	%	Rank Order
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V Risk behavior

17.	Do you Smoke	2	1	1
18.	Do you Consume alcohol	2	1	1

Maximum score=18

Minimum score=0

Table 20 depicts the distribution of women according to deficits in practice related to individual items. It depicts that in physical activity area, maximum 85% women had deficit in practices related to exercise regularly, followed by maximum 71.50% women had deficits in practices regarding drink more than 8 glass of water per day in dietary habits, maximum 72% in both regular health check up and checking of blood sugar in health check up area, 64.50% deficit in easily upset in stress area and 2% deficits both in smoking and consuming alcohol in relation to risk behavior areas of diabetes mellitus. Therefore, it can be concluded that women had maximum 85% deficit in Item no. 4 in relation to physical activity and least 1 deficit in Item no. 17 and 18 in area of risk behavior regarding diabetes mellitus.

Hence, it was concluded that maximum deficit area in practices of diabetes mellitus was in item no. 4 i.e. exercise regularly and least deficit in item no. 17 and 18 respectively.

Validity of the guidelines: On the basis of the findings of the study the guidelines were prepared and distributed among various experts from the areas of Child Health Nursing, Mental Health (Psychiatric) Nursing, Obstetrics and Gynecological Nursing, Medical – Surgical Nursing and Community Health Nursing for the validity. Changes were made in the guidelines after the corrections and valuable suggestions given by the experts. The final guidelines were prepared and distributed and health education was given to women in groups.

- **Major findings**

Major findings related to sample characteristics

- According to the age category, majority of women 36.50% were in the age group of 51-60 years, maximum of women 42.50% were in range of income per month Rs. ≤5000, maximum number of women 66% had no family history of diabetes mellitus, majority of women 56.50% were vegetarians, maximum number of women 35.50% were educated up to matric/10+2, majority of women 64.50% were housewives.

Findings related to assess the practices of women regarding diabetes mellitus

- Majority of women 52.50% had unhealthy practices related to diabetes mellitus.
- The mean practice score was highest 99% in risk behavior regarding diabetes mellitus.

Findings related to identify relationship of practices of women regarding diabetes mellitus with selected variables: age, educational level, occupation, dietary pattern, family income, family history of diabetes mellitus.

- The findings of the study shows that age, education, occupation, family income and family history of diabetes mellitus had significant relationship with the knowledge regarding diabetes mellitus whereas education, Family income and dietary pattern had significant relationship with practices regarding diabetes mellitus.

Findings related to find out deficit areas and develop guidelines regarding diabetes mellitus.

- The deficit area of practice was maximum 32% in health check-up and least deficit area 99% in risk behavior regarding diabetes mellitus

Summary

This chapter deals with analysis and interpretation of data collected from 200 women residing in Mohar Singh Nagar and New Shivaji Nagar areas of Ludhiana. Descriptive and inferential statistics were used for analysis i.e. mean, mean percentage, frequency, standard deviation, t- test, ANOVA test, and bar diagrams were used to depict some of the findings. Graphical representation was used to clarify the table contents.

**CHAPTER –V
DISCUSSION**

In the discussion section of research reports, researcher offers their interpretation of the findings and discuss what the findings might imply for nursing (**Polit DF & Beck TC, 2008**)²⁹.

This chapter deals with a discussion of the findings of the present study, “An Exploratory Study to assess the practices of women regarding diabetes mellitus in selected urban areas of Ludhiana, Punjab. In this part of the chapter, an attempt has been made to discuss the findings of the study in accordance with the objectives of the research problem. The present study was conducted in Mohar Singh Nagar and New Shivaji nagar, areas of Ludhiana, Punjab. Total subjects were 200 women who were not diagnosed with diabetes mellitus. The findings of the study were discussed with reference to results observed by other investigator. The practices of women regarding diabetes mellitus was assessed in relation to age, education, occupation, family income, dietary pattern and family history of diabetes mellitus.

Analysis of data regarding women’s practice revealed that majority of women 52.50% had unhealthy practices and 47.50% had healthy practices regarding diabetes mellitus. These findings were consistent with study conducted by (**Maina MW, Ndegwa MZ, Njenga WE, Wangui E, 2010**)³¹ reported that 41% of the respondents did not indicate any willingness to adopt these healthier lifestyles and 41% of all respondents had good practices while the rest 59% had bad practices in relation to diabetes

prevention, 75% of the people interviewed had poor dietary practices, 72% did not participate in regular exercise and over 80% did not monitor their body weights. However the study conducted by **(Behera KS, Behra RR & Thakur H, 2007)**⁵⁴ in which almost half of the employees (53.5%) stated to do regular exercises 87% use vehicles for going to duty , 19.2% had eating habits of unhealthy junk food almost every day to alternate days, 66% took healthy food regularly. The knowledge about preventive practices also ranged from 51.6% to 80.8%, excepting the need to control weight and avoid smoking/alcohol. Another findings supported by **(Khan RM , Tariq SC, Maaz A, Alam PM M, 2008)**⁴⁶ showed that lack of physical activity, card playing and televisionization was observed in 60% of participants while 33% were overweight and 70% were having meals and snacks outside home activity. Therefore knowledge among women can improve their attitude towards diabetes and in the long run change their practices to embrace healthier lifestyles such as eating healthy foods, and engaging in physical activity as such practices will minimize the risks for diabetes among them.

The findings in the present study revealed weak positively correlation between knowledge and practices regarding diabetes mellitus. The findings of the study supported by **(Pal R, Pal S, Barua A & Ghosh MK, 2010)**⁶⁶ majority participants had poor knowledge about diabetes and negative attitude towards the disease before the health education intervention and improved after the intervention. On the contrary to the findings reported by **(Sheule B, Wipawee KR N & Jaruwan MR N, 2010)**⁶⁷ stated that statistically significant low correlation between total knowledge and total practice regarding foot care in diabetic patients. ($r = .33, p < 0.01$). The findings of study were consistent with the study conducted by **(Ambigapathy R, Ambigapathy S, Ling HM, 2003)**⁶⁸ who showed that there was a very weak, non-significant positive correlation ($r=0.037, p=0.587$) between the global knowledge level and practice level of respondents. This means that being knowledgeable did not necessarily translate to healthy lifestyle practices. Conversely, 49.3% of those with good knowledge had bad practices compared to 62.6% of those without knowledge.

Analysis of present study showed that age had significant relationship on the knowledge score while no significant impact was found on practices regarding diabetes mellitus. The mean knowledge score was highest in the age group 30-40 years and least in the age group of 51-60 years and the mean practice score was the highest in women who were in the age group between 41-50 and least in women who were in age group of 30-40 years. These findings were also inconsistent with the findings reported by

(**G Rafique, Azam SI, White F, 2006**)⁶⁹ who depicts that mean beliefs scores regarding diabetes mellitus also decreased significantly with increasing age ($F = 3.43$; $P = 0.010$) and there was no significant difference in the beliefs and practices scores. Participants 80.4% believed that a person with diabetes should not eat root vegetables, while around 1 in 4 believed that regular use of bitter gourd, a vegetable commonly known as karela, can cure diabetes.

According present study findings, education had highly significant relationship with both knowledge and practices regarding diabetes mellitus. The mean knowledge score was highest 14.11 in women who were educated up to graduation and above and least knowledge mean score 8.32 in illiterate women. The mean practice score was highest 10.43 in the women who were graduate and least 8.64 in those women who were educated up to matric. These findings were supported with the study conducted by (**Abdullah SA & Attia ZA, 2009**)⁷⁰ showed that education had a statistically significant positive association with knowledge of risk factors and preventive measures related to diabetes mellitus. There was a statistically significant association between educational status of participants and knowledge of DM prevention ($\chi^2=35.98$, $df=1$, $P<.001$). The findings of the study were also supported by (**Alessandro RD, Dugee O, Maximilian de C, Bygbjerg, Palam E & Janchiv O, 2013**)⁷¹ showed that education was strong predictor for knowledge around the preventability of diabetes, with less than fifty percent of participants in the lowest educated group, versus almost three-quarters in higher educated groups being aware.

Findings related to dietary pattern revealed that the mean knowledge score of women was highest 13.62 in those who were vegetarian and least 12.43 in those women who were non vegetarian where as mean practices score was highest 10.73 in between vegetarian and least 9.08 in those women who were vegetarian and it was found non significant relationship with knowledge while significant relationship with practices regarding diabetes mellitus. On the contrary to the findings of the study reported by (**Sarah AM, Gita D. M, Eric JB, 2008**)⁷² showed that dietary pattern associated with insulin resistance predicts type 2 diabetes risk after adjustment for a range of confounders. This study adds to the evidence that dietary patterns were an important risk factor for type 2 diabetes. Findings of the another study supported by (**Jukka M, Paul K, Tommi H, Ritva J, Markku H & Arpo A, 2005**)⁷³ who stated that dietary pattern score was associated with a reduced risk and the conservative pattern score (higher consumption of fruits and vegetables) was associated with an increased risk of

type 2 diabetes and the conservative pattern score (consumption of butter, potatoes, and whole milk) was associated with an increased risk of type 2 diabetes. In light of these results, it appears conceivable that the risk of developing type 2 diabetes can be reduced by changing dietary patterns.

According to the present study findings, income had significant relationship with both knowledge and practices regarding diabetes mellitus. It was concluded that income had significant relationship with knowledge regarding diabetes mellitus between the women with income of Rs. \leq 5000 per month and Rs.5001-10000 per month and also between 5000 and >15000 per month whereas the mean practice score was highest 9.69 in women with family income of Rs.1000-15000 per month and least 7.31 in the women with income Rs. >15000 per month. These findings were inconsistent to the findings conducted by **(Hasnain S, Humayun SN, 2009)**⁷⁴ stated that income per capita had shown no significant statistical association with knowledge and practices regarding foot care for diabetes mellitus. These findings were also supported by **(Gowda SN, 2012)**⁷⁵ indicated that 44.8% of the subjects had monthly income of Rs. 5000-9000, compared to income below Rs. 5000 (31.8%) and only 23.4% were above Rs. 9000.00, all subject belongs to middle income group, since the hospital catered to lower income group patients. Another study done by **(Marialaura B, Bonanni AE, Castelnuovo AD, De Lucia F, Donati MB & de Gaetano G, 2012)**⁷⁶ showed that a higher income independently associated with a greater adherence to eating patterns and a lower prevalence of obesity. These findings were also supported by **(Bijoy CV, Feba B, Vikas RC, Dhandapani C, Geetha K, Vijayakumar A)**⁷⁷ who stated that regarding income and knowledge on those subjects with a monthly income of <5000, 5(21.7%) had good, 5(21.7%) had satisfactory and 13(56.6%) had poor knowledge. Those with monthly income 5000-10000, 10(11.2%) of them had good, 33(37.1%) had satisfactory and 46(51.7 %) had poor knowledge. On patients with income >10000, 27(71%) of them had good, 6(15.8%) had satisfactory and 5(13.2%) had poor knowledge.

The mean knowledge score was the highest 14.33 in the women who were self employed and lowest 11.30 in women who were in service while the mean practice score was highest 9.57 in the women who were self employed and lowest 9.13 in those who were housewife. In present study occupation had significant relationship with knowledge while no significant relationship with practices regarding diabetes mellitus. Another findings were supported by **(Mehrotra R, Bajaj S, Kumar D, Singh KJ, 2000)**⁷⁸ that no definite relationship was found between knowledge and occupation. There was a total

lack of knowledge regarding self-care of diabetes in all educational and occupational categories (including patients who were qualified doctors). This calls for an urgent need to create greater public awareness. This study may serve as a guideline for developing an educational package for different subsections of the community. These findings were also supported by **(Saleh F, Mumu JS, Ara F, Begum AH, Ali L, 2012)⁷⁹** who stated that business, one of the categories of occupations, has also been identified as determinant of good practice. We assume that this might have been due to their better access to goods and services as well their independence in availing the health care. Contrarily, rich people showed lower level of practice. The reason needs exploration. Another study done by **(Maskari FA, Sadig M E & Nicholas N, 2010)⁸⁰** who depicts that there were no statistically significant association between patients' practice score regarding diabetes mellitus and occupation.

The mean knowledge score was highest 15.62 in the women who had family history of diabetes mellitus and lowest 11.88 in the women who had no family history of diabetes mellitus. In the present study, family history had significant relationship with knowledge while not significant relationship with practices regarding diabetes mellitus. It would be reasonable to assume that diabetic family members would share their knowledge with non-diabetics and newly diagnosed diabetics. These findings were supported by **(Mohammed AA, Sulaiman AS, Syed GR, Yahya Al & Mushtaq AK, 2008)⁸¹** showed that the presence of a family history of diabetes were found to be positively associated with more knowledge. Another findings were supported by **(Ruth MM, Larry, Stitt W & Gordon J M B, 2006)⁸²** that people with a family history of diabetes were more likely to smoke cigarettes, but were no more physically active than those without a family history of diabetes. Another findings were supported by **(Khan N, Kadayam GG, Syed IS & Jayakumary M, 2012)⁸³** revealed that participants with a family history of DM had significantly higher knowledge of the risk factors for DM but there was no significant association between students having a family history of diabetes and their perception of beneficial behavioral changes.

For the present study the investigator had used modified Fitts and Posner three phase theory of task performance (1967) model according to which that appropriate knowledge about diabetes mellitus helps in development of positive attitude and the performance task or practices. In the present study women's knowledge in this phase may be affected by age, education, family income, dietary pattern and family history of diabetes mellitus. The good practices will be the result of development of positive

attitude and the acquisition of adequate knowledge, if negative attitude is developed, the practices will be poor, and the knowledge acquisition is inadequate. According to **(Subinprabhu C, 2008)**⁵¹ the supportive educative & nursing system was chosen by the investigator to strengthen or to meet the actual and potential deficits of the subject to acquire knowledge and to prevent complications. Exposure to knowledge will strengthen the individual to make them efficient.

In the present study, the structured interview schedule was used to assess the knowledge and practices of women regarding diabetes mellitus. Another study conducted by **(Hamoudi N, Ayoubi MA, Dhia I, Sharbatti, Shatha AI & Shirwaikar A, 2011)**³³ who used a self-administered questionnaire as a tool to assess the knowledge of diabetes mellitus among non-diabetic people who were attending community pharmacy in the hospital.

Guidelines were provided to enhance the knowledge of women regarding diabetes mellitus was supported by **(Thaworn L, Kammapatch S, Pratumpan M, Thin NA & Aung MN, 2012)**⁴⁶ who stated that public knowledge of diabetes is at the lower extreme while female participants had poor knowledge than male participants and health education interventions are urgently needed in this community. The study conducted by **(Khan RMA, Tariq SC, Maaz A & Alam Pasha MM, 2008)**⁴⁸ who stated that emphasis on health education and use of electronic and print media is recommended to improve the public awareness about the risk factors and consequences of diabetes mellitus. The another study also supported by **(Carol AM, 2010)**⁵⁷ who stated that comprehensive program to address the problems of poor nutrition and physical inactivity on a state or community level. State public health authorities are in a unique position to strengthen and coordinate efforts to improve nutrition and physical activity among Americans citizen.

Summary

This chapter deals with discussion to support or compare the findings of the present study with other study findings.

CHAPTER- VI

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter deals with the brief account of the study undertaken including the conclusion drawn from findings, implications of the study and recommendations of future research.

- *Summary*

The present study was conducted to assess the practices of women regarding diabetes mellitus in order to prepare guidelines for the same. An exploratory research approach and non-experimental research design was considered to be appropriate keeping in view the nature of problem. The objectives of the study were to assess the practices of women regarding prevention of diabetes mellitus, to identify the relationship between practices of women regarding diabetes mellitus, to identify the relationship of practices of women regarding diabetes mellitus with selected variables i.e. age, education, occupation, dietary pattern, family income & family history of diabetes mellitus and to find out the deficit areas and develop guidelines regarding diabetes mellitus.

Sample was collected with purposive sampling technique and a total of 200 women were taken for the study. The study was exploratory in nature. Data was collected by using of tool comprising structured interview checklist to assess the practices of women regarding diabetes mellitus. Validity of the content of the tool was carried out by the experts from the College of Nursing, CMC & Hospital and Ludhiana. The study was delimited to women between the age group 30-60 years, who were not diagnosed with diabetes mellitus and who were available at the time of data collection.

A pilot study was undertaken to check the feasibility and practicability of the study in Field Ganj area of Ludhiana, Punjab in the month of October 2012. Final Data was collected in the month of December 2012 from on 200 women who were in between age of 30-60 years and not diagnosed with diabetes in New Shivaji Nagar and Mohar Singh Nagar areas of Ludhiana, Punjab.

It was found that majority of the areas of healthy practices were physical activities, eating habits, health check-up, stress and risk behaviors. The data collected during the study was analyzed using descriptive and inferential statistical measures.

The review of related research and articles helped the researcher to conceptualize the study as well as to develop tools and guidelines for practices regarding diabetes mellitus. Conceptual model of the study was based on modified Fitts and Posner's Three phase theory of learning (1967).

Guidelines were developed for women on the basis of findings of the presented study and literature reviewed. The content validity of guidelines was established by five experts. Hence, guidelines were distributed and health education was given in the groups regarding diabetes mellitus.

- ***Conclusions***

Diabetes does not just happen overnight, it takes many years for it to set in as a derangement of metabolism. That gives us a chance to early detection, possible prevention or delaying the onset. It is estimated that there are 150 million diabetics in the world, 29 million diabetics in India and every fifth person with diabetes will be an Indian. After 25 years the figure will be likely to double, a bigger number of individuals would be at risk because of obesity, alcohol, tobacco abuse, physical inactivity and stress. There experts are of the opinion that sedentary lifestyles and eating habits are responsible for at least 50% of the increase in diabetes cases and large number of people around us are neither aware of the high-risk factors nor the fact that they are diabetic. . It is important to target women at high risk for diabetes for intervention to reduce their risk of diabetes. This knowledge affects their attitude and adopt health lifestyle practices, including health education.

The following conclusions are drawn from the findings of the study.

- Majority of women (52.50%) had unhealthy practices related to diabetes mellitus.
- According to areas of practice regarding diabetes mellitus majority of women had maximum knowledge in risk behavior and least knowledge in health check up areas regarding diabetes mellitus..
- The variables included in the study i.e. education, family income and dietary pattern had significant relationship with practices regarding diabetes mellitus.

- ***Limitations***

- The size of the sample studied was 200 women in the age group 30-60 years. Hence, it was difficult to make a broad generalization.

- Purposive sampling was done from selected urban areas of Ludhiana which also restricts the generalization of the study.

- ***Recommendations***

Based on the findings of the study the following recommendations were made:

1. Similar study can be replicated with a large sample to generalize the finding.
2. The study can be conducted on general population.
3. The study can be conducted in different population and in different setting.
4. An exploratory study can be conducted to assess the influence of healthy lifestyle among women in community.
5. A comparative study can be carried out to find out the knowledge of women in urban areas and rural areas regarding diabetes mellitus.
6. An exploratory study can be conducted to assess the prevalence of diabetes mellitus among women in urban community.
7. Knowledge of health worker can be studied, as they are responsible for primary health care.

- ***Implications of the study***

The findings of this study have certain important implications for the nursing profession i.e. nursing practice, nursing education and nursing research. In all these areas the role of nurse is to identify the knowledge deficit areas, to find out unhealthy practices towards diabetes mellitus. Nurses have expanded and extended role for promotive, preventive, curative and rehabilitative services at individual, family and community level. Nurse's act as an educator, counselor, organizer, direct care providers, leader and motivator.

Nursing Practice

There is a need for the health personnel to take active part in providing health education to the women regarding diabetes mellitus. Health education is a process of assisting people to learn incorporate health related behavior into their everyday life. The community health nursing can give health education regarding risk factors of diabetes mellitus during home visits. Nursing should actively conduct research in this field so as the nurse can play an important role in disease prevention, health promotion, and

educational programmes with effective teaching strategies which motivate people to follow healthy practice in day to day life.

Nursing Education

The nursing curriculum should consist of knowledge related to healthy information using different methods of teaching. Nursing students should be made aware of their role in health promotion & future year, which may help in achieving the goal of health for all the student teaching experiences should emphasize on teaching various community groups on preventive, promotive health practices. Improved & newer techniques have to be used for motivating public participation in diabetes awareness program. The basic philosophy underlying nursing is to educate about healthy practices. These findings have implications for Medical Surgical Nursing and Obstetric and Gynecological nursing. Connecting the curriculum to student lives promotes in-depth discussion through critical and compassionate thinking.

Community Health Nursing

To enhance the awareness in the community is an important aspect of basic education programmes in community health in nursing. Nursing students working in the community area can find opportunity to teach community and formal and informal teaching programme for nursing professionals can also be planned to help them so as to increase the knowledge and practices of women regarding diabetes mellitus. Diabetes as a long term effect on women and some may be very serious too. Continuing education in this area should be provided to the community health workers, so that they can create awareness, assess the risk factors and educate public during home visits on primary prevention. Formal and informal teaching program for nursing professionals can also be planned to help them to increase the awareness of women regarding prevention of diabetes mellitus.

Nursing Research

Findings of the study will act as catalyst to carry out more extensive research on a large population sample in different areas of community. Very few studies of this kinds have been done in Indian setting especially for women regarding preventive practices of diabetes mellitus. Though publication of research findings the average and poor knowledge of women can be promoted to good knowledge by the nurse educator and the information contained in this study can be valuable source of data for the future researchers.

Nursing Administration:

Nursing administration of community health nursing level should be time to time evaluating the women's knowledge regarding diabetes mellitus. In-service education should be conducted for community health nurses to educate them regarding their role in healthy practices, so that they make the community aware about prevention of diabetes mellitus. Administrative support should be provided in conducting in-service education program for the health workers at primary level for knowledge and healthy practices regarding diabetes mellitus.

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