“ASSESS THE EFFECTIVENESS OF EDUCATIONAL INTERVENTION ON KNOWLEDGE AND PRACTICE IN SELF ADMINSTRATION OF INSULIN AMONG CLIENT WITH DIABETES MELLITUS ATTENDING DIABETELOGY OUTPATIENT DEPARTMENT, GOVERNMENT RAJAJI HOSPITAL MADURAI-20”

M. Sc. (Nursing) Degree Examination

Branch – I – MEDICAL SURGICAL NURSING

A dissertation submitted to

THE TAMILNADU DR. M. G. R. MEDICAL UNIVERSITY, CHENNAI

In partial fulfillment of the requirement for the degree of

MASTER OF SCIENCE IN NURSING

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CERTIFICATE

This is to certify that this dissertation titled **"A study to assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus attending Diabetology Out-patient department, Government Rajaji hospital, Madurai-20.**" is bonafide work done by **Mrs. A. Fareetha Banu**, College of Nursing, Madurai Medical College, Maurai-20, submitted to the, The Tamil Nadu Dr. M.G.R. MEDICAL University, Chennai – 32, in partial fulfillment of requirements for the award of the degree of Master of Science in Nursing – Branch I, Medical – Surgical Nursing under the guidance and supervision during the academic period 2009-2011.

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ABSTRACT

TITLE

"Assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus attending Diabetology Out-patient department, Government Rajaji Hospital Madurai-20".

AIM

To assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus.

OBJECTIVES

To assess the level of knowledge and practice in self administration of insulin and to assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among diabetes mellitus clients.

METHODS

Quantitative, Quasi experimental study-one group pretest and posttest design, with 5o diabetes mellitus clients assigned by simple random sampling technique-lottery method, was conducted at Diabetology Out-patient department, Government Rajaji Hospital, Madurai-20, after obtaining informed consent from participants and Ethical Committee approval. Pretest was conducted using semi-structured interview/observation schedule to collect data on demographic variables and knowledge and an observation check list was used to collect data on practice in self administration of insulin. Education intervention by teaching power point slides,

flip chart and insulin administration technique demonstrated and pamphlets issued. Post test was carried out after one week.

FINDINGS

Result showed that overall knowledge level on diabetes mellitus and self administration was inadequate (mean score 37.4%). Overall practice was inadequate (mean score 35.8%). After educational intervention knowledge and practice scores improved compared pretest score (t=24.91, p=0.001, DF=98, significant).overall mean knowledge and practice score is 80.0% and 81.0% respectively. The percentage gain in knowledge and practice is 44.1% and 42.6% respectively. This shows the effectiveness of educational intervention.

CONCLUSION

Education, demonstration, return demonstration and reinforcement through different media can help to improve the knowledge and practice of clients with diabetes mellitus.

ABBREVIATIONS

DM	**-**	**Diabetes Mellitus**
DM1	**-**	**Diabetes Mellitus Type 1**
DM2	**-**	**Diabetes Mellitus Type 2**
T1DM	**-**	**Type 1 Diabetes Mellitus**
T2DM	**-**	**Type 2 Diabetes Mellitus**
WHO	**-**	**World Health Organization**
SC	**-**	**Subcutaneous**
HCP	**-**	**Health Care Provider**
QOL	**-**	**Quality Of Life**
DTTP	**-**	**Diabetes mellitus Treatment and Teaching Programme**
MIEP	**-**	**Multidisciplinary Intensive Education Programme**
IQ	**-**	**Intelligent Quotient**
5DTTP	**-**	**5 Days structured Teaching and Training Programme**
ICT	**-**	**Intensified Conventional Insulin therapy**
SD	**-**	**Standard Deviation**
H	**-**	**Hypothesis**
Df	**-**	**Degree of freedom**
“t”	**-**	**Test of significance**
P	**-**	**Probability Level**
$\mathbf{X^2}$	-	**Chi-Square**
FHS	**-**	**Family Health Strategy**
ADA	**-**	**American Diabetes Association**
BDA	**-**	**Brazilian Diabetes Association**
DF	**-**	**Degree of Freedom**
$\mathbf{HgbA_1C}$	**-**	**Glycosylated hemoglobin**
ISA	**-**	**Insulin Self Administration**
Fig.	**-**	**Figure**

CHAPTER I

INTRODUCTION

"Health is Not a Condition of Matter, But of Mind "

--- Mary Baker Eddy

One of the greatest challenges faced by the modern world is Diabetes mellitus (DM). The physical, social and economic factors involved in the management of diabetes are a continuous strain for the health sector and the government agencies. The number of people with diabetes is expected to rise from 177 million today to 370 million in 2030 World Health Organization. Diabetes will become one of the world's main disablers and killers during the next 25 years (WHO).

Diabetes mellitus is a global health problem and has a major impact on life. Diabetes mellitus affects the population in general irrespective of age, sex, caste, and creed or socio economic status. According to Dr. Hillary king of WHO Diabetes prevalence is more in the developing countries where more than one third of the adult population are affected. This may go as high as one tenth of the population in urban areas. Diabetes is turning into an epidemic of the 20^{th} century and it shows no signs of abating. Diabetes is now among few leading causes of death due to decisive in most countries.

The term diabetes mellitus describes a metabolic disorder or multiple etiologies characterized by chronic hyperglycemia with disturbances of carbohydrate, fat, and protein metabolism resulting from defects in insulin secretion, insulin action, or both. The effects of diabetes include long-term damage, dysfunction and failure of various organs. Diabetes mellitus may present with characteristic symptoms such as excessive thirst, polyuria, blurring of vision, and weight loss. In its most severe forms, ketoacidosis or a non-ketotic hyperosmolar state may develop and lead to stupor, coma and, in absence of effective treatment, death. Often symptoms are not severing, or may be absent, and consequently hyperglycemia sufficient to cause pathological and functional changes may be present for a long time before the diagnosis is made. The long-term effects of diabetes mellitus include progressive development of the specific complications of retinopathy with potential blindness, nephropathy that may lead to renal failure, and/or neuropathy with risk of foot ulcers, amputation,

Charcot joints, and features of autonomic dysfunction, including sexual dysfunction. People with diabetes are at increased risk of cardiovascular, peripheral vascular and cerebrovascular disease.

Although doctors and patients alike tend to group all patients with diabetes together, the truth is that there are two different types of diabetes which are similar in their elevated blood sugar, but different in many other ways. Diabetes is correctly divided into two major subgroups: Type 1 diabetes mellitus and Type 2 diabetes mellitus. This division is based upon whether the blood sugar problem is caused by insulin deficiency (Type 1) or insulin resistance (Type 2). Insulin deficiency means there is not enough insulin being made by the pancreas due to a malfunction of their insulin producing cells. Insulin resistance occurs when there is plenty of insulin made by the pancreas (it is functioning normally and making plenty of insulin), but the cells of the body are resistant to its action which results in the blood sugar being too high.

Management of diabetes mellitus includes diet, exercise, and drugs. Drugs include oral hypoglycemic agents and insulin therapy. Individual's compliance with treatment is very important in managing the disease and preventing the complications. It requires knowledge and understanding on disease and management. Skills required to self care management depend on the information provided by the health care providers. Comprehensive management is necessary to effectively control the disease.

A recent survey estimated that the majority of 110 million diabetes clients worldwide are in the developing countries and that the incidence of diabetes is increasing in India. Sixteen million Americans have diabetes, yet many are not aware of it. Americans have a higher rate of developing diabetes during their lifetime.

Education improves well being and quality of life. Properly designed education program not only should present facts but also should address the emotional responses to diabetes. Education improves self-care management. Diabetes education can play an important role in clarifying the treatment regimen, reinforcing the skills necessary to successfully manage diabetes, and supporting efforts to integrate self management behaviors into one's life. Importance of education and training of clients with diabetes about their treatment and to support their self management efforts to improve their glycemic control.

Out patient education does, however more advantages over in-patient education have. There is flexibility of limiting of the serious extension of the educational experience over weeks and months, ability to educate in a normal life setting rather than in the artificial in-patients environment and opportunity of follow up session.

The need to use exogenous insulin to maintain good metabolic control has been increasingly acknowledged as a therapeutic option for diabetes mellitus Type 2 (DM2) in addition to being a classical indication for diabetes mellitus Type 1 (DM1). Multiple daily doses of insulin need to be injected into the subcutaneous tissue to achieve glycemic control, which has been shown to be an essential condition to prevent acute and chronic complications of this disease. The most used instrument among the several available in the market to inject insulin into the subcutaneous tissue is the disposable syringe due to its low cost, easy access, health professionals' familiarity with its use.

Due to the increased number of people with diabetes mellitus using insulin in recent years, more emphasis should be given to the standardization and improvement of insulin administration technique, focusing on properly teaching this technique so that people become aware of their responsibility and make less mistakes during insulin administration.

Self care is a crucial element in secondary prevention of diabetes. Diabetics have a poor level of knowledge about the disease and self-care and hence a very casual attitude towards the disease. This predisposes them to the risk of development of complications in later life. Health education is an area which needs to be addressed immediately to improve patients' knowledge and skills of diabetes self-care practices so that they can better contribute towards the management of their disease.

1.1 NEED FOR THE STUDY

The greatest challenge faced by the modern world is Diabetes mellitus (DM). It is expected that approximately 366 million people will be affected by Diabetes mellitus by the year 2030. According to WHO statistics, the global prevalence of diabetes mellitus in the year 2000 was 171,000,000 and it expected and approximated to be raised to 366,000,000 by 2030. Where as its long arms have widely spread in India too, by the statistical report of WHO, in the year 2000 the prevalence was 367,000 and expected to be raised to 635,000 by the year 2030 in India.

The lifestyle disease known to be restricted to urban population in the country till a few years ago has now invaded rural India as well, with as much as 3% of the total rural population being diagnosed with diabetes. Urban diabetes mellitus patients are estimated to account for nearly 10% to 11% of the total 25 million patients in India. The disease presently affects 10% of the affluent class and nearly 33% of the lower levels of population. The prevalence of diabetes mellitus is 16.6% in Hyderabad, followed by Chennai with 13.5%, Bangalore with 12.4%, Delhi with 11.6%, and Mumbai with 9.3%.

By 2025, the number of diabetes mellitus patients is expected to increase by 41% in developed countries to 72 million from the present level of 51 million. In developing countries, the incidence of the disease would surge by 170% to 228 million from 84 million.

The study was conducted on “awareness and knowledge of diabetes in Chennai” - The Chennai Urban Rural epidemiology study. A structured Questionnaire administered to 26,001 individuals, and the result shows that only 75% (19642/26001) of the whole population reported that they know about a condition called diabetes mellitus, nearly 25% of the Chennai population was unaware of the condition called diabetes mellitus. 602% of all participants and 76.7% of the self reported diabetic subjects know that the prevalence of diabetes mellitus was increasing in India. Only 22.27% of the whole population and 41.0% of the Known diabetes mellitus subjects were aware that Diabetes could be prevented. Awareness and knowledge regarding diabetes mellitus is still grossly inadequate in India. Massive diabetes mellitus education programmers are urgently needed both Urban and Rural India.

In patients with diabetes mellitus, physicians are often concerned about increasing functional limitations that may impede a successful self-management. In particular, the correct handling of the insulin injection requires complex self-management abilities. Among these functional limitations, loss of visual acuity, loss of manual abilities and cognitive decline are of most importance.

A Survey on diabetes mellitus Awareness, Risk Factors and Health Attitudes in a Rural Community' made by a team of doctors from the Christian Medical College, Vellore, and doctors in Khowai district of Tripura, revealed 9 % prevalence of diabetes mellitus in persons above the age of 30 among the survey population.

American Diabetes Association and Brazilian Diabetes Association recommended the steps for the safe administration of insulin, from hand washing to compression on the injection site. The study recommended the development of interventions focused on education of patients regarding insulin injection.

The investigation on the acquisition of skill in the self-administration of insulin (by insulin pens) among 79 diabetes mellitus outpatients at Ehime University School of Medicine in order to evaluate the influence of such skill on glycemic control. The degree of skill acquisition by patients with poor glycemic was significantly lower than that by those with good control and patients who had continuously used insulin pens over a 3-year period had higher rates of incorrect usage. In addition, the patients who kept the needle of the insulin pen pointing downwards for a certain period of time was significantly lower than that for those who held the needle downwards for less than this period of time. These results indicated that the precise acquisition of skill in the self-administration of insulin is necessary to achieve good glycemic control and that keeping the needle pointing downwards for a sufficient period of time is the most important factor in the self-administration procedure. They also suggested that medical staff should keep a check on the skill of patients in the self-administration of insulin and repeatedly provide instruction on this to patients.

According to the register of out-patient Department of Diabetology, Government Rajaji Hospital, Madurai-20 the number of patients receiving insulin therapy is as follows:

Table 1: Number of Patients Receiving Insulin Injection at Diabetology Out-Patient Department

Year	Number of patients		Total
	Male	Female	
2010	45635	51449	97,084
2009	55484	70326	1,25,810
2008	62066	67279	1,29,339
2007	66213	71184	1,37,397
2006	83468	94592	1,78,060

Above table reveals the magnitude of the problem and need for educating the affected individuals in management of disease. Many factors contribute to patients for self management. Their attitude, perception of the patients rather than demographic characteristics. All those involved in case meet training in the educational process. The nurse is responsible for helping the patient to set realistic goals. Since active self management is essential for every efficient diabetes mellitus treatment. Patient's education is undoubtedly the most important part of a good diabetic service. The initial management and education of new cases calls the active involvement and expertise of the diabetes mellitus specialist nurse. The nurse is particularly responsible for patients' education.

Because many people who take insulin at home made error in self administration. They fail to take injection as prescribed or misuse them in a manner that could be serious. Errors in taking injections occur for many reasons like people may have inadequate knowledge about the purpose of injection. So adequate knowledge and understanding of the disease and necessary treatment are essential for the effective self management.

By looking at the statistics it is clear that diabetes mellitus is affecting the people in drastic way. By reviewing the previous studies it is evident that the diabetes

mellitus patients have lesser knowledge regarding its management especially in the aspects such as self administration of insulin injection. Many studies have recommended the education programme for the diabetes mellitus patients.

Researcher has come across many diabetes mellitus clients during clinical practice as well as at the place of residence who found difficult to administer insulin by self and made errors in following correct technique of administration of insulin. Considering this the researcher decided to undertake study, "To assess effectiveness of educational intervention on knowledge and practice in self administration of insulin" and improve their knowledge and practice by providing teaching and demonstration.

1.2 STATEMENT OF THE PROBLEM

"A study to assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus attending Diabetology Out-patient Department, Government Rajaji Hospital, Madurai-20".

1.3 AIM OF THE STUDY

The aim of the study is to assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin injection among clients with diabetes mellitus attending out-patient department of Diabetology Department.

1.4 OBJECTIVES

1. To assess the level of knowledge and practice in self administration of insulin among client with diabetes mellitus.
2. To assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among client with diabetes mellitus.
3. To compare the pre-test and post-test level of knowledge and practice in self administration of insulin among clients with diabetes mellitus.
4. To correlate between the post-test level of knowledge and practice in self administration of insulin among client with diabetes mellitus.
5. To associate the post test level of knowledge and practice in self administration of insulin with selected demographic variables of client with diabetes mellitus.

1.5 HYPOTHESES:

H_1: There will be significant gap in knowledge and practice in self administration of insulin among clients with diabetes mellitus.

H_2: There will be significant difference in the pre-test and post-test level of knowledge and practice in self administration of insulin among clients with diabetes mellitus.

H_3: There will be significant correlation between the post-test level of knowledge and level of practice in self administration of insulin among clients with diabetes mellitus.

H_4: There will be significant association between the post-test level of knowledge and practice in self administration of insulin with selected demographic variables.

1.6 OPERATIONAL DEFINITIONS:

1. Effectiveness:

The impact of the educational intervention and to bring about changes in the level of knowledge and practice in self administration of insulin.

2. Educational Intervention:

It refers to the teaching on diabetes mellitus with the help of power point slides, flipcharts, and pamphlets and also demonstrating the methods of administrating the insulin.

3. Knowledge:

It refers to the existing and gained information by the clients regarding diabetes mellitus and self administration of insulin assessed by semi-structured interview/observation schedule.

4. Practice:

It refers to the response of clients in self administration of insulin before and after the educational intervention and will be assessed using observation check list.

5. Self Administration:

It is a process of administering insulin by the diabetic client on his own body.

6. Insulin:

Insulin is a hormone required for utilization of glucose by cells in the body.

7. Clients:

It refers to the persons who is diagnosed with diabetes mellitus and is receiving insulin injection.

1.7 ASSUMPTIONS

Client with diabetes mellitus usually have inadequate knowledge and practice in self administration of insulin, and educational intervention will improve their level of knowledge and practice.

1.8 DELIMITATIONS

- This study is done in a short of period of time (4 weeks duration).
- Only clients with diabetes mellitus in the age group of 30-50 years included in the present study.
- Clients receiving self administration of subcutaneous insulin injection only included in the study.
- Only clients with Diabetes Mellitus attending out-patient department of Diabetology department of Government Rajaji hospital, Madurai-20 included in this study.

CHAPTER - II

REVIEW OF LITERATURE

This chapter gives an account of the literature reviewed for the purpose of studying the knowledge and practice in self administration of insulin.

A review of related literature is an essential part of scientific research. It is a systematic search of a published work to gain information about a research topic. Through the literature review, the researcher generates a picture of what is known about a particular situation and the knowledge gap that exists between the problem statement and the research subject problems and lays a foundation for research plan.

In the present study, the researcher done extensive review of literature related to diabetes mellitus and its complications, Self administration of insulin and need for education.

2.1 PART I: LITERATURE RELATED TO NEED FOR EDUCATION ON SELF ADMINISTRATION OF INSULIN

Section – A: Literature related to Diabetes Mellitus

Section – B: Literature Related To Insulin Administration

2.2 PART II: CONCEPTUAL FRAMEWORK

Section – A: Literature related to Diabetes Mellitus

Rochester, CD. (Jan, 2010). Conducted a research to Collaborative drug therapy management by pharmacists for initiating and adjusting insulin therapy in patients with type 2 diabetes mellitus in a Veterans Affairs Health Care System. The Veterans Affairs Maryland Health Care System (VAMHCS) at Baltimore reported that 24% of its patients with diabetes had a glycosylated hemoglobin (HbA1c) value of >9% or no recently documented HbA1c and that 91% of its patients with an HbA1c value of >9% were treated with oral anti hyperglycemic agents alone. They formulated the insulin initiation clinic to provide an appropriate infrastructure to address the needs of patients with poorly controlled Type 2 diabetes who required

insulin therapy. Patients received comprehensive education during the initial visit regarding self-management skills, self-monitoring of blood glucose levels, treatment of hypoglycemia, insulin injection administration, and lifestyle modifications. The authors concluded that the use of a preplanned insulin initiation resulted in the successful and improved patients' glycemic control.

Surendranath, A. et.al. (Sep 2010). Conducted a study to assess the knowledge and practice of insulin self-administration among patients with diabetes mellitus. Non experimental descriptive design with semi structured interview schedule was used. Sixty diabetic patients under ISA were considered as a sample for the study. Study was conducted at Diabetic Clinic in Devaraj Urs Medical College & Hospital and Research Centre of Kolar. The results of the study revealed that the patients on insulin did not have adequate knowledge, practice and skill on ISA(Insulin self administration) and there was a positive correlation between knowledge and practice of ISA. The authors concluded that the education is likely to be effective when the characteristics of the patients in terms of their knowledge, attitude and practices about self care management are known. Therefore, it is of paramount importance, that people with diabetes mellitus should be provided with ongoing high quality need based education to be delivered by skilled Health Care Provider (HCP).

Peyrot, M.et.al. (Feb, 2009). **S**tudied the factors associated with patient frequency of intentionally skipping insulin injections at Department of Sociology, Loyola University Maryland. Data were obtained through an Internet survey of 502 U.S. adults self-identified as taking insulin by injection to treat Type 1 or Type 2 diabetes mellitus. Results showed that Intentional insulin omission was reported by more than half of respondents; regular omission was reported by 20%. Significant independent risk factors for insulin omission were younger age, lower income and higher education, Type 2 diabetes mellitus, not following a healthy diet, taking more daily injections, interference of injections with daily activities, and injection pain and embarrassment. The authors concluded that health care providers should consider recommending strategies and tools for addressing these problems to increase adherence to prescribed insulin regimens.

Revista.et.al. (2009). Recommended that three important stages should be followed while giving injections such as hand washing, insulin preparation and administrations.

Lerman, I. et.al. (Jan-Feb 2009). Conducted a prospective cohort study of low-income patients with Type 2 diabetes mellitus, aged 45-75 years attending a tertiary health care center in Mexico City, evaluated the psychosocial barriers to insulin use, the clinical characteristics of these patients, and the possible causes of non adherence to insulin regimens months after prescription. 29 participants included in the study received 6 to 10 units of Neutral Protamine Hagedorn insulin before bedtime and received a referral to visit with a diabetes nurse educator. Brief medical history, complete battery of questionnaires, and laboratory workup were obtained at baseline and 1 to 3 months after insulin prescription. The main outcome was adherence or non adherence to insulin therapy, and it was correlated with several variables including attitudes toward insulin, diabetes mellitus self-management, diabetes-related knowledge, depression, and diabetes mellitus related distress. The results showed that negative attitudes toward insulin were very common, particularly in patients with less education and poorer diabetes-related knowledge (odds ratio, 6.2; 95% confidence interval, 1.04-47.3; P = .02). Patients who did not adhere to therapy were most commonly women and were depressed (P = .05). Improved adherence was significantly associated with the additional support of a diabetes mellitus nurse educator (odds ratio, 6.6; 95% confidence interval, 1.0-55.7; P = .02). The authors recommended that improving patient perception and acceptance of insulin with the help of diabetes mellitus educators can facilitate earlier and more aggressive intervention and thus optimize glycemic control.

Khattab, M.et.al. (**Mar-Apr 2009).** Conducted a study to determine factors associated with poor glycemic control among Ordanian patients with Type 2 diabetes mellitus. A systematic random sample of 917 patients was selected from all patients with Type 2 diabetes mellitus over a period of 6 months. Results showed that increased duration of diabetes mellitus (>7 years vs. < or=7 years) (OR=1.99, P<or=.0005), not following eating plan as recommended by dietitians' (OR=2.98, P<or=.0005), negative attitude towards diabetes mellitus, and increased barriers to adherence scale scores were significantly associated with increased odds of poor glycemic control. The authors found that longer duration of diabetes and not adherent to diabetes mellitus self-care management behaviors were associated with poor glycemic control. They recommend that an educational program that emphasizes lifestyle modification with importance of adherence to treatment regimen would be of great benefit in glycemic control.

Leona, V. (2008). Conducted a survey at Department of Medicine, Veterans Administration Hospital, California to evaluate patient capability for self-management of diabetes mellitus patients. 17 patients had been placed on insulin without formal instruction. They found that over 35 % of the patients interviewed lacked any formal training. Almost one half of the patients who claimed to have attended training programs could not demonstrate adequate knowledge or skills in any of the major areas of self-care: insulin administration, urine testing, diet, foot care, and management of hypoglycemia and hyperglycemia. While diabetes mellitus patients with training were more knowledgeable than diabetes mellitus patients without training, the difference was slight. The authors recommended for systematic analysis of patient knowledge and the evaluation of training programs on a continuing basis.

Braun, A. et.al. (Oct 2008). Conducted a prospective study to evaluate the impact of initiation of insulin therapy, metabolic control and structured patient education on the diabetes mellitus related quality of life (QOL) in 71 consecutively recruited patients with insulin-treated Type 2 diabetes mellitus at the University hospital. All patients participated an inpatient diabetes mellitus Treatment and Teaching Program (DTTP) for conventional insulin therapy (mean age 68.9 years. Diabetes mellitus related quality of life was assessed before and 6 months after participation in the DTTP using the standardized questionnaire of **Lohr** analyzing the subscales: social relations, physical complaints, worries about the future, dietary restrictions, fear of hypoglycemia, and daily struggles. Results revealed that only patients switched on to insulin therapy showed significant improvement in diabetes mellitus related quality of life 6 months after participation in the DTTP($P=0.03$), fewer physical complaints ($P=0.03$), fewer worries about the future($P=0.02$), fewer daily struggles ($P=0.01$) and less fear of hypoglycemia($P<0.001$). The authors recommended appropriate interventions resulting in better metabolic control, such as starting on insulin therapy within a structured patient education program seem to be an effective approach to improve patients' diabetes mellitus -related quality of life.

Diabetes Care. (2008). An article stated that diabetes mellitus self management education is an essential component of the patient centered plan of care. Establishment of patient, centered goals is critical in self management of the disease and should include nutrition, weight control and reduction, exercise, smoking cessation, sick day management, foot care and eye care.

Lang, S. et.al. (Feb 2008). Conducted a study to assess the effective of insulin therapy on lung function and lung infestations in diabetic cystic fibrosis patients and found that insulin therapy improves the lung functions and reduces the number of infections with H.influenza, S.Pnemonia in diabetic cystic fibrosis patients.

Beebe., C. & O'Donnell. M. (Jun 2008). **C**onducted a study to assess for educational need for patients with diabetes mellitus at University of Illinois at Chicago and found out that the patient is the self-manager of Type 2 diabetes mellitus. The role of the health care professional is to provide the knowledge, skills, and behavior change support to empower the patient to do so. They conclude that such factors coupled with a growing body of research evidence are shaping the way diabetes mellitus self-management education is provided**.**

Michael.et.al. (2007).Conducted a study to explore the impact of diabetes education in maintaining life style changes. The results indicated that self management education was more effective for those with a more recent diagnosis, previous diabetes education and less psychological impact from the disease.

Colin.et.al, (2006). Conducted a .study at Michigan Medical School, specifies that a patient centered approach will enable an individual to become empowered that helps to self manage the condition and to make informed choices so as to enhance their own quality of life. The nurse thus acts as a facilitator.

Hagedoorn, M. et.al. **(Mar 2006).** Assessed the effectiveness of diabetes education in improving self management in insulin treated adults. 67 insulin-treated patients with a partner completed questionnaires on admission to a Multidisciplinary Intensive Education Programme (MIEP) and 3 months after completing the core module of MIEP. The effect of over protection was assessed. Results showed that the increase in internal locus of control and decrease in HbA1c were both significantly less for female patients who perceived their partner to be rather over protective than for female patients who did not perceive their partner to be overprotective. The authors concluded that an intervention programme with the aim of reducing overprotection by the partner, or the perception of this, may enhance self-management in patients participating in diabetes mellitus education.

Clarke, W.L.et.al. (2005). University Hospital Uppsala Sweden conveys that some patients may have reduced awareness of hypoglycemia and they may benefit from education which will help them to recognize all the early warning sign.

Schiel, R.et.al.(Jun 2005). Studied the effectiveness of a structured treatment and educational program for patients with Type 2 diabetes mellitus, insulin therapy and impaired cognitive function. All patients with Type-2 diabetes mellitus admitted to hospital to participate in a structured treatment and teaching program. Patients with impaired cognitive function (< 91 IQ points) were randomized, they participated either in an established structured treatment and teaching program according to Berger et al. (standard group: n = 35) or in the DikoL program (DikoL group: n =33). Immediately after participation and 0.5 years later, the quality of diabetes control, patients' knowledge of diabetes, their ability for diabetes self-management, and their satisfaction with the program were evaluated. The results showed that Patients of the DikoL group had a comparable quality of diabetes control (HbAlc: DikoL vs. standard group: 8.5 + 1.3 vs. 8.3 +/- 1.4%; p = 0.62)and diabetes-related knowledge (DikoL vs. standard group: 9.6 +/- 4.4 vs.10.3 + 3.8points; p = 0.52), but significantly better results in respect of their ability for diabetes mellitus self-management (DikoL vs. standard group: 15.9 +/- 3.1 vs. 12.5 +/-4.1 points; p = 0.001) than patients of the standard group. The authors concluded that quality of life is improved with structured education program.

Muller, U.A.et.al, (Sep 2004). Studied the long-term efficacy of a 5-day structured teaching and treatment programme for intensified conventional insulin therapy and risk for severe hypoglycemia at University of Jena Medical School, Department of Internal Medicine II, Germany. A long-term evaluation of a 5-day structured teaching and treatment programme (5-DTTP) for intensified conventional insulin therapy (ICT), was performed to elucidate factors determining HbA1c and the incidence of severe hypoglycemia. A total of 71 patients were examined at baseline and 45.5 +/- 4.2 months following participation in a 5-DTTP. In the group of 21 patients with severe hypoglycemia were identified certain crucial gaps in diabetes mellitus knowledge. Performing multiple regression analysis, strong correlations were found betweenHbA1c and diabetes mellitus knowledge.(r = -0.58. P = 0.002 for 50 patients without hypoglycemia and r = -0.63, P = 0.05 for 21 patients with

hypoglycemia). In the total group, the most important factors determining HbA1c, were diabetes mellitus knowledge (r = -0.055, P = 0.007) and daily insulin dosage/kg body weight (r =2.13, P = 0.0008, R2 = 0.26). The authors conclude that intervention like education of patients on a continuous basis and modifications of the DTTP's with more information and training in the recognition and treatment of hypoglycemic episodes seems to be essential to prevent hypoglycemia and to improve the efficacy of DTTP's over longer periods of time.

Section – B: Literature Related To Insulin Administration

Sousa, VD.et.al. (Dec 2010). Conducted a stud**y t**o develop and refine three new scales that measure diabetes mellitus self-care agency, diabetes mellitus self-efficacy and diabetes mellitus self-management. A methodological design was used to conduct this study. 10 clinicians and 10 insulin-treated individuals with Type 2 diabetes mellitus (T2DM) from a diabetes mellitus care center in the southern USA participated in this study. Results revealed that evaluation of the items and the directions of the scales by the sample of insulin-treated individuals with T2DM exceeded the minimum criteria of 80% inter-rater agreement. The authors concluded that scales can be used by diabetes care providers to assess and follow-up individuals with diabetes mellitus who need intense case management.

Wong, S.et.al. (Feb 2010). Conducted a study with the objective to determine the prevalence of insulin refusal amongst Singaporean patients with Type 2 diabetes mellitus, to compare perceptions regarding insulin therapy use between patients who were willing to use insulin and those who were not and to identify demographic factors that might predict insulin refusal. A cross-sectional interviewer-administered survey incorporating demographic variables and 17 perceptions regarding insulin use (14 negative and 3 positive) was conducted among a sample of 265 patients attending a public primary healthcare centre. Results showed that 7 of every 10 patients expressed unwillingness to use insulin therapy (70.6%). The greatest differences in perceptions between patients willing to use insulin therapy and those who were not included fear of not being able to inject insulin correctly (47.4 % vs. 70.6%), fear of pain (44.9% vs. 65.8%), belief that insulin therapy would make it difficult to fulfill responsibilities at work and home (46.2 % vs. 66.8%) and belief that insulin therapy improved diabetes mellitus control (82.1% vs. 58.3%). A tertiary level of education

was associated with willingness to use insulin (odds ratio 3.3, confidence interval 1.8-6.1), and significant differences in perceptions were present in patients with different educational levels. Findings of this study suggest that interventions aimed at increasing insulin therapy use should focus on injection-related concerns, perceived lifestyle adaptations and correction of misconceptions. Different interventions may also be required for patients of different educational groups.

Veikko Kovisto, M.D., et.al. (Jan 2010). Conducted a study to assess the alterations in insulin absorption and in blood glucose control associated with varying insulin injection sites in diabetes mellitus patients at Department of Internal Medicine, New Haven, Connecticut. Results showed that in seven insulin-dependent diabetes mellitus subjects the disappearance rate of ^{125}I-labelled short-acting insulin from injection sites in the abdominal wall was 86% greater than from the leg ($P < 0.005$) and 30% greater than from the arm ($P < 0.05$). Absorption from the arm was 40% greater than from the leg ($P < 0.05$). These results indicate that changing the insulin injection site from the leg to the abdomen or arm accelerates the absorption of insulin and diminishes the postprandial rise in plasma glucose. The authors recommend that varying insulin injection sites within the same anatomic region rather than between different regions may diminish daily variations in insulin absorption and in metabolic control in insulin-dependent diabetic subjects.

John, P. Bantle. (May 2010). Conducted a study to determine the relationship between rotation of the anatomic regions used for insulin injections and day-to-day variability of plasma glucose in Type 1 diabetes mellitus subjects at Department of Medicine, Minnesota. The objective was determine to what extent day-to-day variation in blood glucose levels can be reduced if insulin is injected in the same anatomic region rather than in different regions using a rotational scheme, as is commonly recommended, 12 Type I diabetes mellitus subjects were studied. Insulin injections were given in the abdomen for 3 days and rotated among arms, abdomen, and thighs for 3 days using a crossover design with random assignment of treatment order. Results showed that overall values for the Standard Deviation of plasma glucose levels were 2.7 ± 0.2 mmol/L for the abdominal injection period and 3.7 ±0.3 mmol/L for the rotating injection period. Overall values for the variance of plasma glucose levels were 9.2 ± 1.4 $mmol^2/L^2$ for the abdominal injection period

and 17.4 ±2.2 $mmol^2/L^2$ for the rotating injection period. The authors recommend that the common clinical practice of rotating the anatomic regions used for insulin injections increases day-to-day variation in blood glucose concentration. Use of a single anatomic region, e.g., the abdomen, for all insulin injections may reduce this variation and allow greater precision in the adjustment of insulin doses.

Gilbert, C. et.al. (May 2010). Conducted a study to describe the practices of patients with diabetes mellitus regard to insulin self injection techniques. By systematic random sampling technique participants were assigned to experimental and control group with sample size of 100 in each group. Structure teaching program carried out to experimental group. The results highlight in particular the importance of patient education. The authors recommend that the proper instructions regarding self administration of insulin enhance the correct practice.

George, T. et.al. (2009). Compared the Importance of Timing of Pre-prandial Subcutaneous Insulin Administration in the Management of Diabetes Mellitus at Mayo Clinic, Minnesota. They compared the effects of 30-min subcutaneous insulin infusions started 60 min, 30 min, and immediately before meal ingestion on postprandial plasma glucose and insulin profiles in 8 subjects with insulin-dependent diabetes mellitus. Results showed that administration of insulin 60 min before meal ingestion provided plasma glucose and insulin profiles closest to normal and permitted less insulin to be used. They suggest that adjustments in the timing as well as in the amount of insulin administered pre-prandial may be used in the management of diabetes and that prolonging the interval between administration of insulin and meal ingestion and this may reduce insulin requirements and thus decrease the hyperinsulinemia usually associated with insulin therapy.

Kakou, B. et.al. (2009). Studied patients' knowledge of and practices relating to the disposal of used insulin needles with aim to determine (1) how patients currently dispose of used insulin needles, (2) whether patients were educated about disposal of their used insulin needles, and (3) who educated patients about the disposal of their used insulin needles. A self-administered questionnaire was administered to a convenience sample of patients from four locations in Richmond, Virginia. Any patient, who used insulin, was at least 18 years old. Results revealed that 50 responses were received with 40% indicating that education had been received

on the disposal of used needles. From that 40%, nurses were identified as the source of education 60% of the time and pharmacists 25% of the time. Approximately 50% of the respondents reported disposing of used needles directly in the trash when at home. While away from home, 22% reported placing used needles in the trash, and 38% took them home for disposal. The authors concluded that patients are not consistently educated regarding the proper disposal of used needles. Health care practitioners should play a larger role in educating patients about the potential risks of inappropriate needle disposal and appropriate disposal methods. Future research is still needed to understand fully the magnitude of the problems associated with inappropriate needle disposal by patients.

Rebecca, et.al. (Jun 2009). Conducted a study to assess the effectiveness of Self Instructional Module regarding diabetes mellitus and concluded that Self Instructional Module was significantly effective in increasing the knowledge of adults.

Suzanne, B.J. et.al. (2009). Conducted a study to assess youngster's knowledge about insulin-dependent diabetes mellitus among children and parents at Department of Pediatric Psychiatry. They assessed three domains- general information, problem solving and skill at urine testing and self-injection. These youngsters' parents completed the general information and problem-solving components of the assessment battery. Results showed that mothers were more knowledgeable than fathers and children. Girls performed more accurately than boys, and older children obtained better scores than did younger children. More than 80% of the youngsters made significant errors on urine testing and almost 40% made serious errors in self-injection. A number of other knowledge deficits were also noted. Duration of diabetes was not related to any of the knowledge measures. Inter correlations between scores on the assessment instruments indicated that skill at urine testing or self-injection was not highly related to other types of knowledge about diabetes mellitus. Furthermore, knowledge in one content area was not usually predictive of knowledge in another content area. The results of this study emphasize the importance of patient variables in considering the development and use of patient educational programs. He also recommends for regular assessment of patients' and parents' knowledge of all aspects.

Thais, S.et.al. (2009). Conducted a study to describe the most common correct, incorrect self administration techniques for insulin, using disposable syringes by patients cared for the family health strategy and found that the average score of steps correctly performed during the insulin preparation and administration techniques was 61% and not statistically significant association was found between this average and the Socio- Demographic and Clinical variables.

Warren, et.al. (2009). Conducted a study about multidisciplinary and psychosocial approaches to diabetes education. The study states that multi professional education and training in diabetes care and management should result in improved patient care and outcomes and course assessment should be based on demonstrable patient outcomes in terms of risk reduction and improved quality of life.

Workenh.et.al. (2009). Conducted a study to evaluate the accuracy of self administration of insulin by diabetic patients. In 78% of the subjects insulin self administration was inaccurate and the errors were due to inefficient teaching given to the patients.

Stacciarini, I. et.al. (Nov 2009). Conducted a cross-sectional study aimed to describe the most common correct and incorrect self-administration techniques for insulin using disposable syringes by patients cared for by the Family Health Strategy (FHS), relate the findings to Socio-Demographic variables and also identify the professional responsible for teaching this technique. A total of 169 patients were selected by simple random sampling in 37 FHS units in a city in the state of Minas Gerais, Brazil. The results identified errors in all the steps recommended by the American Diabetes Association and Brazilian Diabetes Association for the safe administration of insulin, from hand washing to compression on the injection site. The FHS favors the development of interventions focused on the needs of the clientele registered at the unit, stimulating self-care. Results from this study can contribute to the planning of these interventions.

Rakel, RE. **(Sep 2009).** Conducted a study with a view to find out relationship between improving acceptance and adherence in diabetic management. Maintaining tight glycemic control is an important issue for patients with type 2diabetes. Empowering patients to be actively involved in the management of their

diabetes can improve glycemic control through education, communication, and the use of patient-friendly insulin regimens. The authors found out that the primary care physician plays an important role in helping patients manage their disease by encouraging initiation of treatment with insulin analogs, which are more convenient, more predictable, and better tolerated than traditional human insulin therapies.

Spray, J. et.al. (Oct 2009). Evaluated the patient injection technique among Type-1 diabetes mellitus clients. They observed that patients were mismanaging their condition irrespective of the length of diagnosis. This article explores how the ward is an ideal environment for identifying and evaluating the practical, physical and psychological components of patient insulin administration, through a direct observational approach. Discussion surrounding contributory barriers pertaining to its neglect, proactive implications for practice that potentially could overcome such issues, along with the underpinning pathopyhsiology, are addressed. Nurses will thus gain a greater perspective concerning the significance of routinely evaluating the competencies of patients' insulin administration within the ward environment.

Frich. et.al. (2008). Has suggested that if daily or weekly visit in congestion with follow up telephone calls may be necessary to improve the assessment, planning and evaluating the patients self management and home health nurse is able to intervene early to remedy potential problems.

Zehrer,C.et.al. (2008). Conducted a study to determine the use of abdominal injection sites in reducing the glucose variability among the Type 1 diabetes mellitus patients at University of Minnesota Hospital and Clinic. This study indicates that it is inadvisable for Type I diabetes mellitus subjects to rotate insulin injection regions, rather, insulin injections should be confined to a single anatomic region (usually the abdomen) as this will decrease day-to-day variability in blood glucose *concentration.* The authors say that such a decrease should allow greater precision in adjusting insulin doses, thereby helping achieve good control.

Pradeep Raman, C. et.al. (Oct-Dec 2008). Conducted a study to describe the Pseudo “insulin allergy” among diabetes mellitus clients at department of endocrinology and diabetes, Kerala Institute of Medical Science. In a series of 22 patients with suspected insulin allergy, poor injection technique (n=5) and skin

diseases (n=3) contributed to the suspected allergy. Insulin injection abscesses occur in patients with diabetes mellitus and are mainly due to staphylococcus aureus. The authors found out poor insulin technique due to improper diabetic education led to injection abscesses. The authors recommend diabetic education focusing on insulin administration to prevent such episode.

Kabadi, U.M. (Apr 2008). Studied the methods to overcome the barriers in starting insulin therapy at Department of Medicine, College of Medicine, Iowa. They found that barriers include the fear of the needles i.e. number of injections as well as number of times of self blood glucose monitoring, fear of hypoglycemia and weight gain as well as the convenience, compliance and the cost. The results showed that most of these patients are likely to require insulin therapy with increasing duration of the disorder because of the progressive cell failure. The authors recommend that the most important aspect of insulin therapy must revolve around the regimen most suitable and acceptable because of its ability in overcoming these barriers while being effective in attaining and maintaining desirable glycemic control.

Barcus.I. et.al. (2007). Conducted a study to investigate the acquisition of skill in the self administration of insulin found that the precise requisition of skill in the self administration of insulin is necessary to achieve good glycemic control and that keeping needle pointing downwards for a significant period of time is the most important factor in the self administration procedure.

Hambridge, K. (May 2007). Studied the prevalence of lipohypertrophy in diabetes mellitus care. The result shows that its prevalence in insulin-injecting patients with diabetes mellitus remains high. The problem for the patient is that the injection of insulin into a site of lipohypertrophy, although painless, may lead to erratic absorption of the insulin, with the potential for poor glycemic control and unpredictable hypoglycemia. Recommendations for medical and nursing practice in diabetes care to improve prevention and management of lipohypertrophy are made.

Newmen, K.D. et.al. (2006). Conducted a study among 55 insulin using adult diabetes mellitus to measure the ability and prepare insulin in a syringe at Hotel Dieu, Paris. They noted that 48% did not roll vial mix it properly, 7% did not eliminate air bubbles from the syringe and 23% contaminated the regular insulin. They found that the associated factors were age, arthritis of hand, visual acuity, and education.

Funnell, M.M.et.al. (Mar-Apr, 2006). Conducted a study to describe the self management support that can be provided by 7 diabetes mellitus educators for Type 2 diabetes mellitus patients who are transitioning from therapy with oral hypoglycemic agents to insulin. The role of the diabetes mellitus educator in patient education and self-management support during all aspects of insulin therapy is discussed. Results showed that although some patients make the decision fairly easily, the introduction of insulin therapy is likely to raise many issues and questions for many Type 2 diabetes mellitus patients. The more reluctant patients may experience psychological insulin resistance, a syndrome where insulin therapy is viewed as a threat or failure, which can affect health professionals as well. The authors found that education and ongoing self-management support are needed for informed decision making and the initiation and maintenance of insulin therapy. They recommend that diabetes mellitus educators have a critical role to play during both the decision-making process and the safe transition to insulin therapy.

Shani, G. S. (2006). Conducted a study regarding structured teaching programme on home care management of diabetes mellitus. They use purposive sampling to select 50 samples. Structured questionnaire was administered for pre test. The same day STP was implemented. Post test conducted on 5th day with the same questionnaire. In post test 30% of participants had moderately adequate knowledge and 70% with adequate knowledge. In pre test it was 60% had inadequate knowledge and 36% had moderately adequate knowledge. They suggested that every individual understands that his health is in his hands. The health personnel at hospitals under the community level should take part in educating diabetes mellitus clients irrespective of their demographic characteristics and chronicity of illness.

Aust. et.al. (2005). Conducted a study to explore medication knowledge and self management practices of people with Type 2 diabetes mellitus and found that medication knowledge and self management were inadequate and could leads to adverse events.

2.2 CONCEPTUAL FRAME WORK

Conceptual framework is a group of concepts and a set of proportion that spell out the relationship between them; conceptual framework deals with abstractions (concepts) that are assembled by virtue of their relevance to a common theme, conceptual frame work plays several interrelated roles in the progress of science. It serves as a spring board for the generation of research hypothesis and can provide an important concept for scientific research. The conceptual framework facilitates communication and provides systematic approach to nursing research, education and communication.

The present study aims at evaluating the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus. The conceptual framework for the study was derived from the general system theory and modified. **Ludwig Von Bertalanffy's** described this theory in the late 1930's.

According to this theory a system is a set of inter-related parts that come together to form a whole. Real systems are open and interact with their environment and they can acquire qualitatively new properties. This theory describes how to break whole things in parts and then learn how the parts work together in the system.

INPUT:

The first is input which is the information, energy or matter that enters the system. For a system to work well the input should concentrate in achieving the purpose of the system.

In the present study the energy or matter which enters the system is Age, Gender, Religion, Educational Status, Occupation, Income, Marital Status, Place of Residence, Food Habits, Family History, Previous Exposure, and Duration of illness of Diabetes Mellitus clients and their existing level of knowledge and practice in self administration of insulin.

THROUGHPUT:

According to the theorist, throughput refers to the process used by the system to convert raw material or energy from the environment into products that are usable by the system itself or by the environment.

In the present study the investigator manipulates the environment by Establishing objectives, developing tools, identifying and selecting contents, validating the questionnaire and carrying out the intervention through teaching and demonstration on diabetes mellitus and self administration of insulin.

In this active process, the nurses convert the energy from the teaching and demonstration enhances the knowledge and practice in self administration of insulin.

OUTPUT:

According to the theorist it refers to the product or service which results from the systems throughput.

Output in this study refers to the end product of the system. This is evidenced by improved level of knowledge and practice in self administration of insulin.

EVALUATION:

Evaluation is the information about some aspects of data or energy processing that can be used, to evaluate and monitor the system and to guide it to more effective performance.

In the present study, evaluation measures the effectiveness of the output. This is accomplished by the established outcome criteria (inadequate knowledge 0-50%, moderate knowledge 51%-75%, adequate knowledge 76%-100%).

FEEDBACK:

The final function is feedback which is the process of communicating what is found in evaluation of the system. It is the information given back to the system to determine whether or not the purpose or end results of the system has been achieved.

The final part of feedback communicates what is found in the evaluation and it tells whether the intervention was effective in enhancing the level of knowledge and practice in self administration of insZulin.

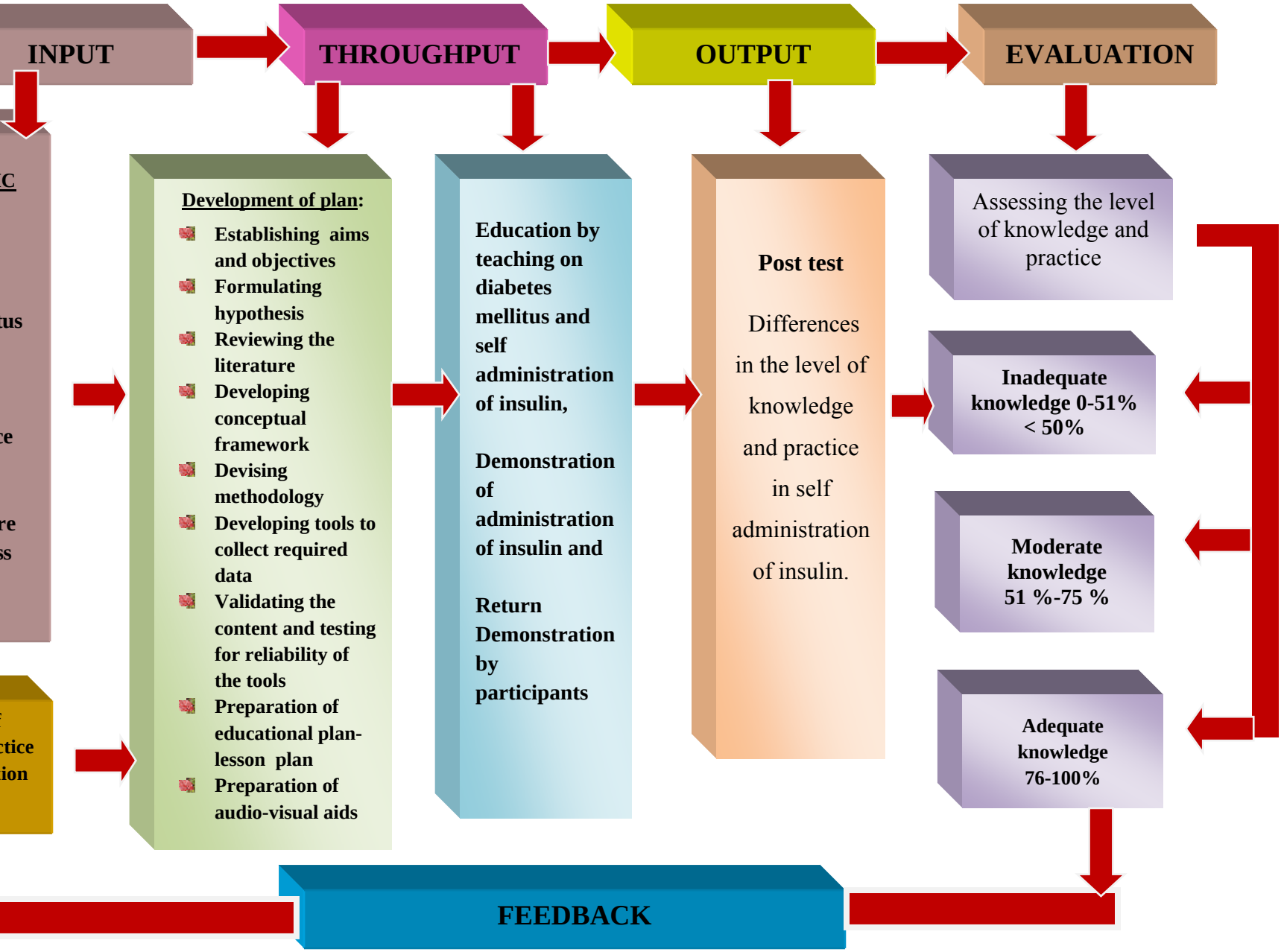


FIG.1: MODIFIED LUDWIG VON BERTALANFFY'S GENERAL SYSTEM MODEL

CHAPTER-III

RESEARCH METHODOLOGY

Research methodology provides a brief description of the method adopted by the investigator in the present study. The methodology of research refers to the principles and ideas on which the researchers base their procedures and strategies. It includes the research approach, design, and population, sampling technique, development and description of the tools, intervention, and pilot study report, explanation of data collection procedure and finally plan for the statistical analysis.

The present study is aimed at assessing the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus. The nature of the research problem and availability of the samples guided the selection of research approach.

3.1 RESEARCH APPROACH

A research approach tells the researcher about the collection of data that is, what to collect, when to collect, how to collect, and how to analyze. It also helps the researcher with suggestions of possible conclusions to be drawn from the data.

A quantitative approach was adopted in the present study as the investigation is aimed at evaluating the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus.

3.2 RESEARCH DESIGN

The research design is the plan, structure and strategy of investigations of answering the research question. It is the overall plan or the blue print the researcher select to carry out the study.

In view of the nature of the problem and to accomplish the objectives of the study, Quasi experimental study design was used to assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with Diabetes mellitus.

One group pre-test post-test design was used in the present study

R O_1 X O_2

R - Randomization

O_1 - Pre-test

X - Treatment or Intervention

O_2 - Post-test

3.3 SETTING OF THE STUDY

The study was conducted at the Diabetology department out-patient department at Government Rajaji Hospital, Madurai-20. On an average 300 patients are attending the department every day. Out of which about 100 patients of Type 1 diabetes mellitus and Type 2 diabetes mellitus are receiving insulin injection per day. The criteria for selecting this setting were feasibility for conducting the study, availability of samples and familiarity of the investigator with the settings.

3.4 VARIABLES

Independent Variable:

Educational intervention on self administration of Insulin.

***Dependent Variable*:**

Knowledge and Practice in self administration of Insulin among Diabetes mellitus clients.

3.5 POPULATION

Population is the entire universe of individuals, objects and events potentially available for the research study. In this study the population includes all patients with Diabetes Mellitus being treated at Diabetology outpatient department of Government Rajaji Hospital, Madurai.

3.6 SAMPLE

Diabetes mellitus clients of Type 1 and Type 2 in the age group of 30 – 50 years, require insulin injection attending the diabetic outpatient department at Government Rajaji Hospital-Madurai.

3.7 SAMPLE SIZE

50 clients diagnosed with diabetes mellitus receiving subcutaneous self insulin injection.

3.8 SAMPLING TECHNIQUE

Probability Sampling – **Simple Random Sampling- Lottery Method** was used. In lottery method all the samples in the sampling frame are numbered and the numbers are written in equal square slips and rolled, each bearing only one number. Rolled slips are put in a global container and thoroughly shuffled. Desired number of slips is taken from the container one after another. Each time before drawing the slip container is mixed thoroughly. The units bearing the number of slips drawn constitute the random sample**.**

3.9 CRITERIA FOR SAMPLE SELECTION

Inclusive Criteria:

- Clients with Type 1 and Type 2 Diabetes Mellitus between age group of 30-50 years and receiving self administration of insulin.
- Those who are willing to participate in the study.
- Clients who can understand Tamil language.
- Clients of both genders.

Exclusion Criteria:

- Clients who have participated in the pilot study.
- Clients those who have undergone an education programme previously.

3.10 DEVELOPMENT OF THE TOOL

With extensive review of literature and consultation with expert's opinion the tool was selected to generate the data. Tool for data collection consisted of three sections of semi-structured questionnaire. This comprised of:-

Section A: Tools for collection of Socio-Economic Demographic profile of client with diabetes mellitus, prepared by the researcher.

Section B: Tool to assess the Knowledge on self administration of insulin, among Clients with diabetes mellitus, prepared by the researcher.

Section C: Observation Check List used to assess the practice on self administration of insulin among clients with diabetes mellitus.

3.11 DESCRIPTION OF TOOL:

The semi structured observation/interview schedule was organized in 3 sections- Section A, Section B and Section C which includes:-

Section A:

Demographic variables consist of 12 items which includes age, gender, religion, education status, occupation status, income, marital status, place of residence, food habits, family history of diabetes, previous exposure of seeing administering of insulin injection, duration of diabetic mellitus.

Section B:

Knowledge on Self administration of insulin, includes general information on diabetes mellitus (10 items), and Knowledge on self administration of insulin (34 items), which consists of meaning of insulin, storage of insulin, administration of insulin, rotation of site, and complication of insulin.

Section C:

Observation Check list, consists of 32 items which include practice regarding self administration of insulin it includes, preliminary procedures (7 items), drawing of single insulin (8 items), drawing mixing insulin (8 items), procedure for injecting insulin (7 items) and after care procedure (2 items).

3.12DEVELOPMENT OF EDUCATIONAL INTERVENTION

The Educational Intervention was developed based on the review of the related research / non-research literature and the objectives stated in the blue print.

The following steps were adopted to develop the Educational Intervention

- Development of objectives and goals.
- Development of lesson plan on diabetes mellitus and self administration of insulin.
- Lesson plan on self administration of Insulin injection procedur**e**
- Preparation of audio-visual aids-flip chart, power point slides, pamphlets

3.13 SCORING KEY

***Section B*:**

Each correct answer was given a score of "1" mark and wrong answer "0" mark. Knowledge score obtained is converted into percentage and accordingly the level of knowledge.

SCORE INTERPRETATION: Total score 44

SCORE	LEVEL OF KNOWLEDGE	MARKS
0 - 50 %	In adequate	0 - 22
51 - 75 %	Moderately adequate	23 - 33
76 - 100 %	Adequate	**34 - 44**

SECTION C:

Observation check list is scored as 1 mark for correct practice and 0 mark for incorrect practice.

PRACTICE SCORE INTERPRETATION: Total score 32

Score	Level of Practice	Marks
0 - 50 %	In adequate practice	0 - 16
51 - 75 %	Moderately adequate practice	17 - 24
76 - 100 %	Good practice	25 - 32

3.14 CONTENT VALIDITY

The content validity of the tool was established on the basis of opinion from the three experts, one from Head of the Diabetology Department of Government Rajaji Hospital, Madurai and three from nursing experts and a statistician validated the tool content. There were no major changes suggested by the experts. The minor modification suggested by the experts was incorporated in the tool, all the experts agreed to the content and the tool was finalized.

3.15 RELIABILITY OF THE TOOL

After pilot study the tool was subjected to test for its reliability. The reliability of the tool is compound by using split half **Karl Pearson's** correlation formula [raw score method]. The reliability of Split Half test was found using **Karl Pearson** correlation by deviation method.

To assess the reliability of the tool the investigator had used test re-test method. The reliability score obtained was r = 0.63 which indicated substantial correlation between knowledge and practice of scores. Hence the tool was considered reliable for proceeding with the study.

3.16 PILOT STUDY

With the formal permission obtained from Head of the Diabetology Department and content validity from the nursing experts the pilot study was conducted for one week period from 22-10-2010 to 29-10-2010 at Diabetology Outpatient Department of Government Rajaji Hospital, Madurai-20. By simple random sampling technique – Lottery method, 5 patients with diabetes mellitus receiving insulin subcutaneous injection were selected and pre-test was conducted to assess knowledge and practice in self administration of insulin using semi-structured interview schedule and observation check list. Educational intervention-teaching on general information about diabetes mellitus and method of administering subcutaneous insulin injection was demonstrated. After one week post test assessment was done using the same questionnaire and return demonstration was assessed by same observation check list.

Data collected was subjected to descriptive statistical analysis because of small sample size and the result showed that there is significant difference in pre-test and post-test knowledge and practice score in self administration of insulin. The investigator found out that education program increased the level of knowledge and practice. The study shows the feasibility to conduct the original study as planned.

3.17 PROCEDURE FOR DATA COLLECTION

The study was conducted for a specific period of one month's duration from 15th November 2010 to 15th December 2010, at out-patient department of Diabetology Department with the permission of the Head of the department of Diabetology, Government Rajaji Hospital, Madurai and the Ethical Committee.

Screening of the diabetes mellitus clients with criteria for selection was done.

Information about the study was given to the clients and informed consent obtained in the prescribed form. The investigator assured confidentiality of the research and findings.

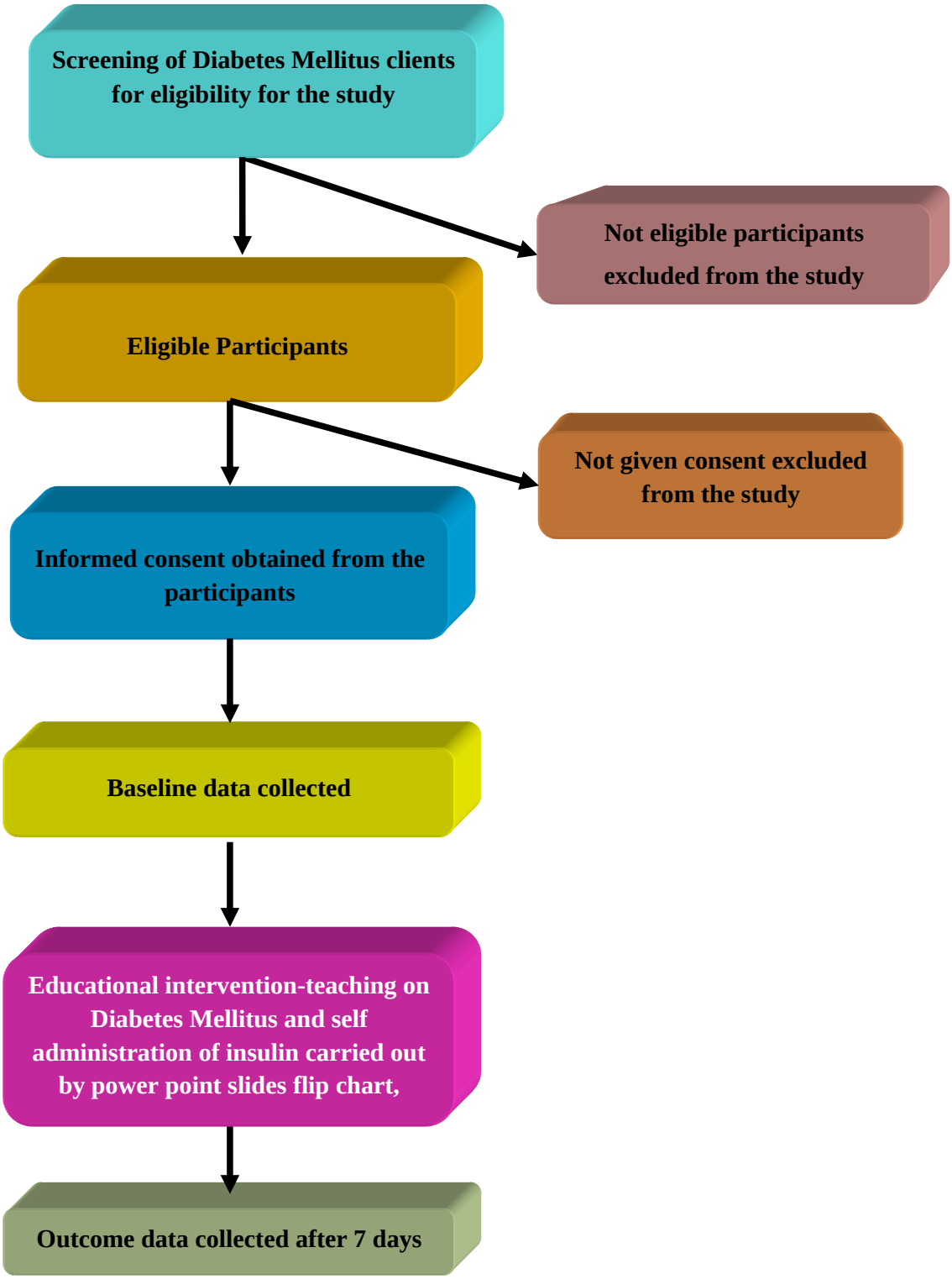
Pre-Test conducted using prepared tools. Information was collected from the study participants by interview and observation check list.

Samples were selected by Simple Random sampling technique-lottery method.

Structured teaching on Diabetes Mellitus and self administration of insulin was done using power point slides, Flip chart, and administration of insulin by subcutaneous injection was demonstrated to the participants. A pamphlet on technique of self administration of insulin was distributed. The time duration spent with each client was 45 minutes.

Participants requested to practice the taught technique and report for post-test after 7 days. Post was conducted using the same tools and return demonstration of administration of insulin subcutaneous injection was assessed using the same observation check list.

FIG.2: SCHEMATIC REPRESENTATION OF STEPS IN PROCEDURE



3.18 PLAN FOR DATA ANALYSIS

Data analysis was planned to include descriptive and inferential statistics.

Descriptive Statistics

- Frequency and percentage distribution to analyze the demographic data of diabetes mellitus clients.
- Mean, Mean percentage and Standard Deviation to assess the knowledge and practice score.

Inferential Statistics

- Chi-square test to associate between the levels of knowledge and practice with selected demographic variables.
- Paired "t' test assess the effectiveness of education intervention and to compare the pre-test results with post-test results.

3.19 PROTECTION OF HUMAN RIGHTS

The present study was conducted after the approval of the Institutional Ethical Committee of and Government Rajaji Hospital, Madurai Medical College, Madurai, Informed consent obtained from each study participant after giving full information about the study. Anonymity was assured to each participant and maintained by the researcher.

CHAPTER - IV

DATA ANALYSIS AND INTERPRETATION

Data analysis is a method of organizing data in such a way that the research question can be answered. Interpretation is the process of making sense of results and of examining the implications of the findings within a broader context.

This chapter deals with the analysis and interpretation of data collected from the clients with Diabetes Mellitus.

DEMOGRAPHIC AND SOCIO-ECONOMIC DETAILS OF THE CLIENTS PARTICIPATED IN THE STUDY

TABLE 2: DEMOGRAPHIC PROFILE OF CLIENTS WITH DIABETES MELLITUS N=50

Demographic variables	No. of Clients	Percentage (%)
Age		
30 -35 years	24	48.0 %
36 - 45 years	17	34.0 %
46 yrs – 50 years	9	18.0 %
Gender		
Male	27	54.0 %
Female	23	46.0 %
Religion		
Hindu	38	76.0 %
Muslim	5	10.0 %
Christian	7	14.0 %
Education status		
No formal education	8	16.0 %
Primary	10	20.0 %
Middle	19	38.0 %
Higher secondary	9	18.0 %
Diploma	1	2.0 %
Degree	3	6.0 %

Demographic variables	No. of Clients	Percentage (%)
Occupation status		
Business	3	6.0 %
Clerical	3	6.0 %
Skilled worker	2	4.0 %
Unskilled Worker	13	26.0 %
Agriculture	11	22.0 %
Unemployed/ Housewife	18	36.0 %
Monthly income		
< Rs.2000	18	36.0 %
Rs.2001 -4000	23	46.0 %
> Rs.4000	9	18.0 %
Marital status		
Single	4	8.0 %
Married	43	86.0 %
Widow / Widower	3	6.0 %
Place of residence		
Rural	19	38.0 %
Urban	31	62.0 %
Food habit		
Vegetarian	10	20.0 %
Non vegetarian	40	80.0 %
Family history of diabetes mellitus		
Father	3	6.0 %
Mother	13	26.0 %
Siblings	1	2.0 %
Grand parents	1	2.0 %
None	32	64.0 %
Previous exposure of seeing the administering of insulin injection through-		
Media	8	16.0 %
Hospital	5	10.0 %
Family members	14	28.0 %
None	23	46.0 %

Demographic variables	No. of Clients	Percentage (%)
Duration of having diabetes mellitus		
0 - 3 yrs	17	34.0 %
3 - 5 yrs	21	42.0 %
> 5 yrs	12	24.0 %

Above table describes the demographic characteristics of participants with diabetes mellitus.

Above table shows that majority of the participants (82%) are between age group of 30 years and 45 years and 18% of them are above 45 years aged (Fig. 3). Male participant's accounts for 54% and females account for 46%. Participants belong to Hindu, Christian and Muslim religion are 78%, 14% and 10% respectively.

When considering their educational status 16% of them had no formal education, 20% of them had primary education, 38% had middle school education, 18% had higher secondary level and diploma and degree holders' accounts for 2% and 6% respectively (Fig. 4).

Majority of the participants are either unemployed or house wives (36%). Among employed participants, clerks (6%), skilled workers (4%), and unskilled workers (26%), remaining 22% are agricultural workers, and some of them do business (6%).

Majority of participants (82%) income falls below 4000 rupees per month and 18% of them only earn more than 4000 rupees per month.

Most of the participants are married (86%), widower constitutes 6% of participants and some of them are Unmarried (8%).

Urban and rural residents accounts for 62% and 38% respectively. Most of them (80%) are non-vegetarians. Family history of Diabetes Mellitus present in 36% of participants (mother 26%, siblings 2%, Father 6%, Grandparents 2%) and 64% of participants had no family history (Fig. 5).

Participants received information about diabetes mellitus and self administration of insulin through various sources like media (16%), hospital (10%), family members (28%), but 46% of them had no source of information (Fig. 6).

The participants who are suffering with diabetes mellitus for less than 5 years is 76% and 24 % of participants having this illness for more than 5 years (Fig. 7).

Fig. 3: PERCENTAGE DISTRIBUTION OF AGE

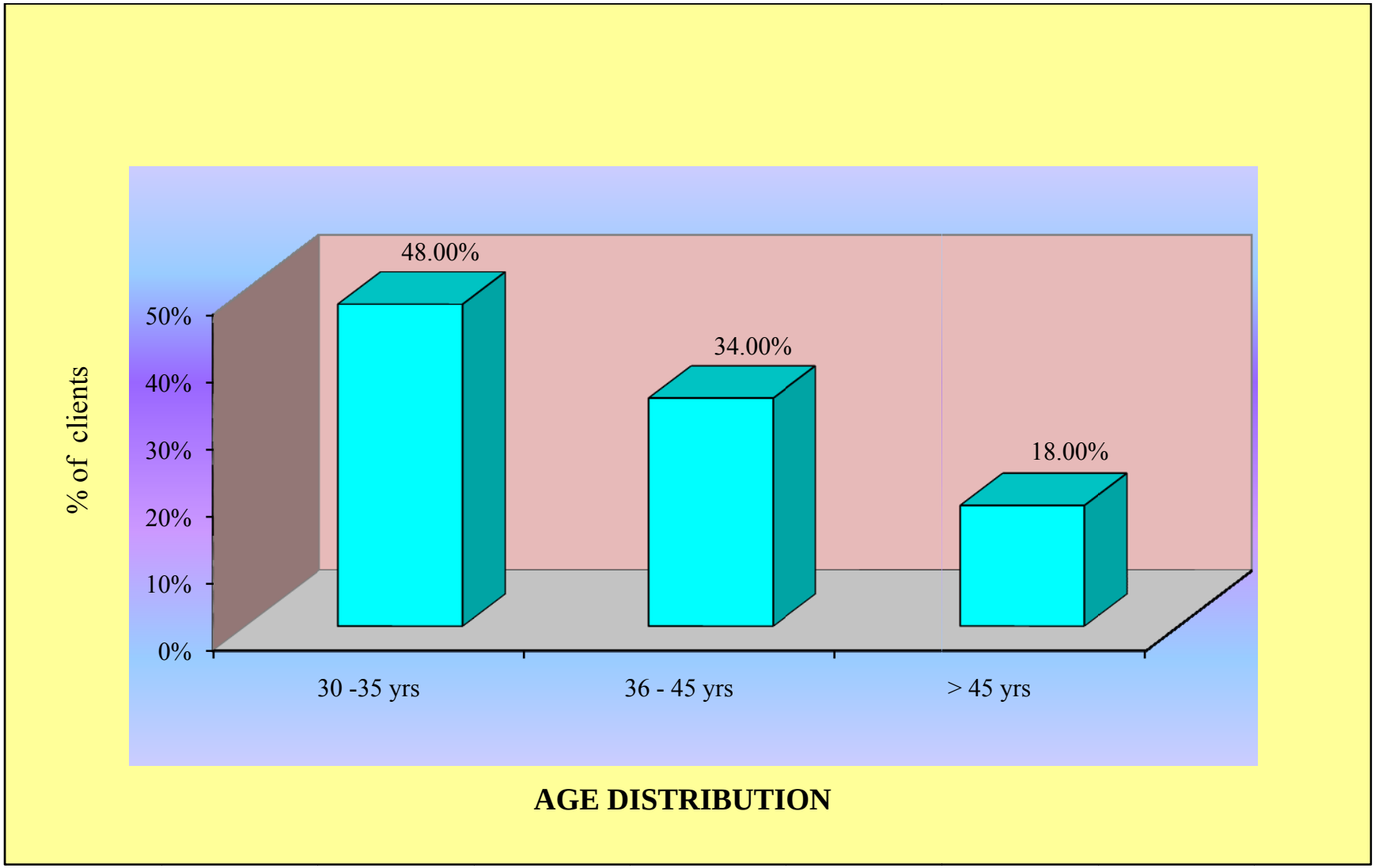


Fig. 4: PERCENTAGE DISTRIBUTION OF EDUCATIONAL STATUS

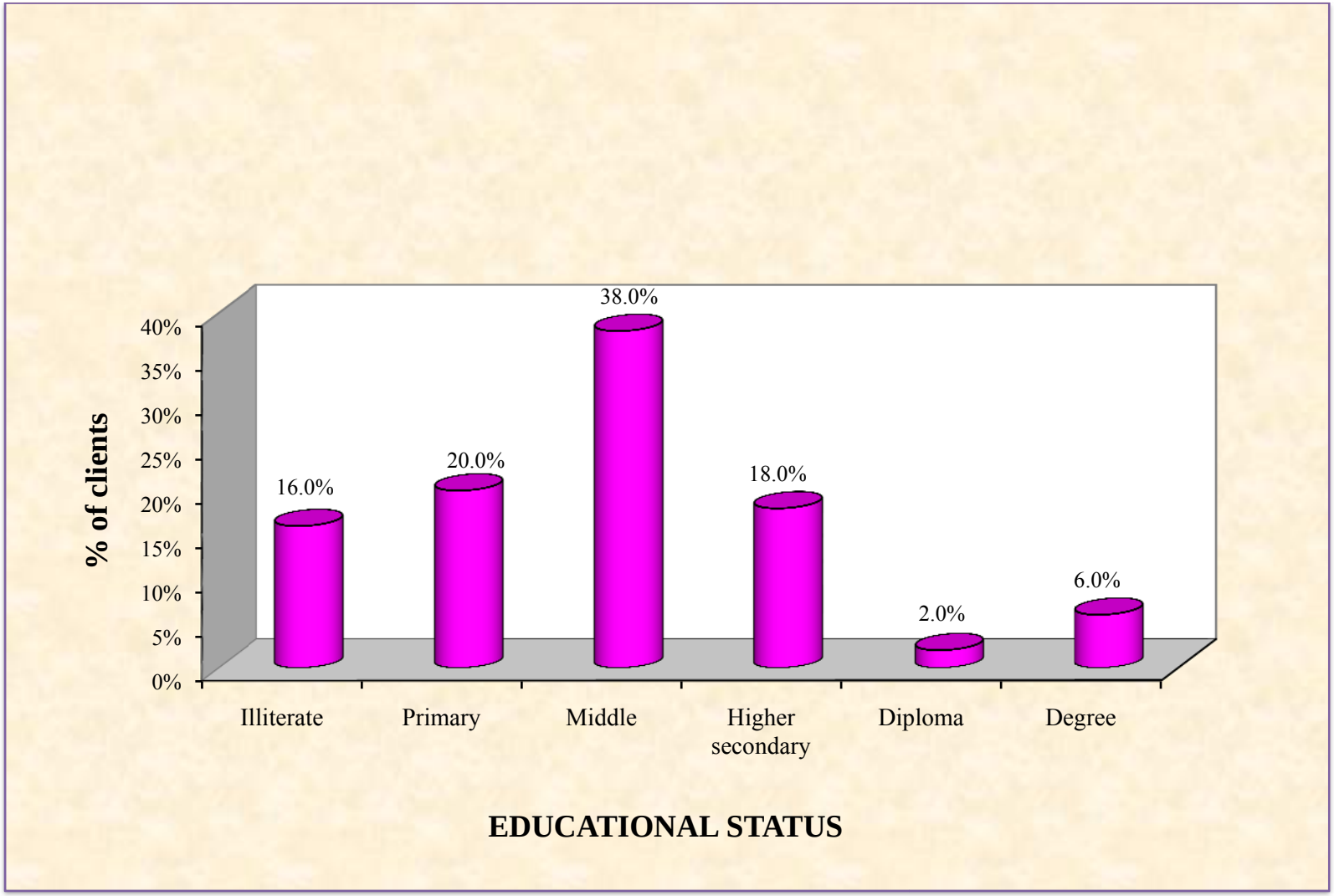


Fig. 5: PERCENTAGE DISTRIBUTION OF FAMILY HISTORY OF DIABETES MELLITUS

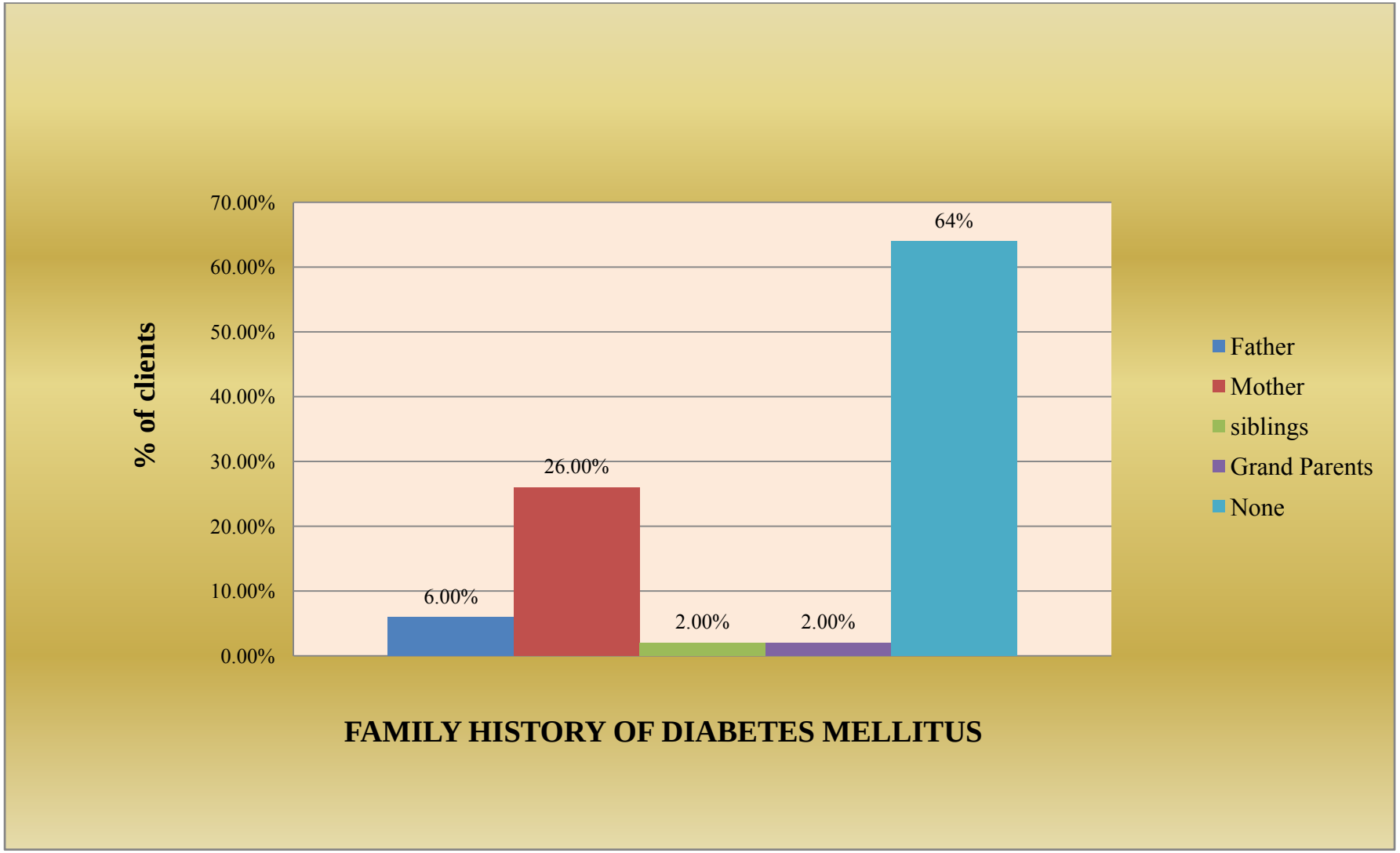


Fig. 6: PERCENTAGE DISTRIBUTION OF PREVIOUS EXPOSURE OF SEEING THE ADMINISTRATION OF INSULIN

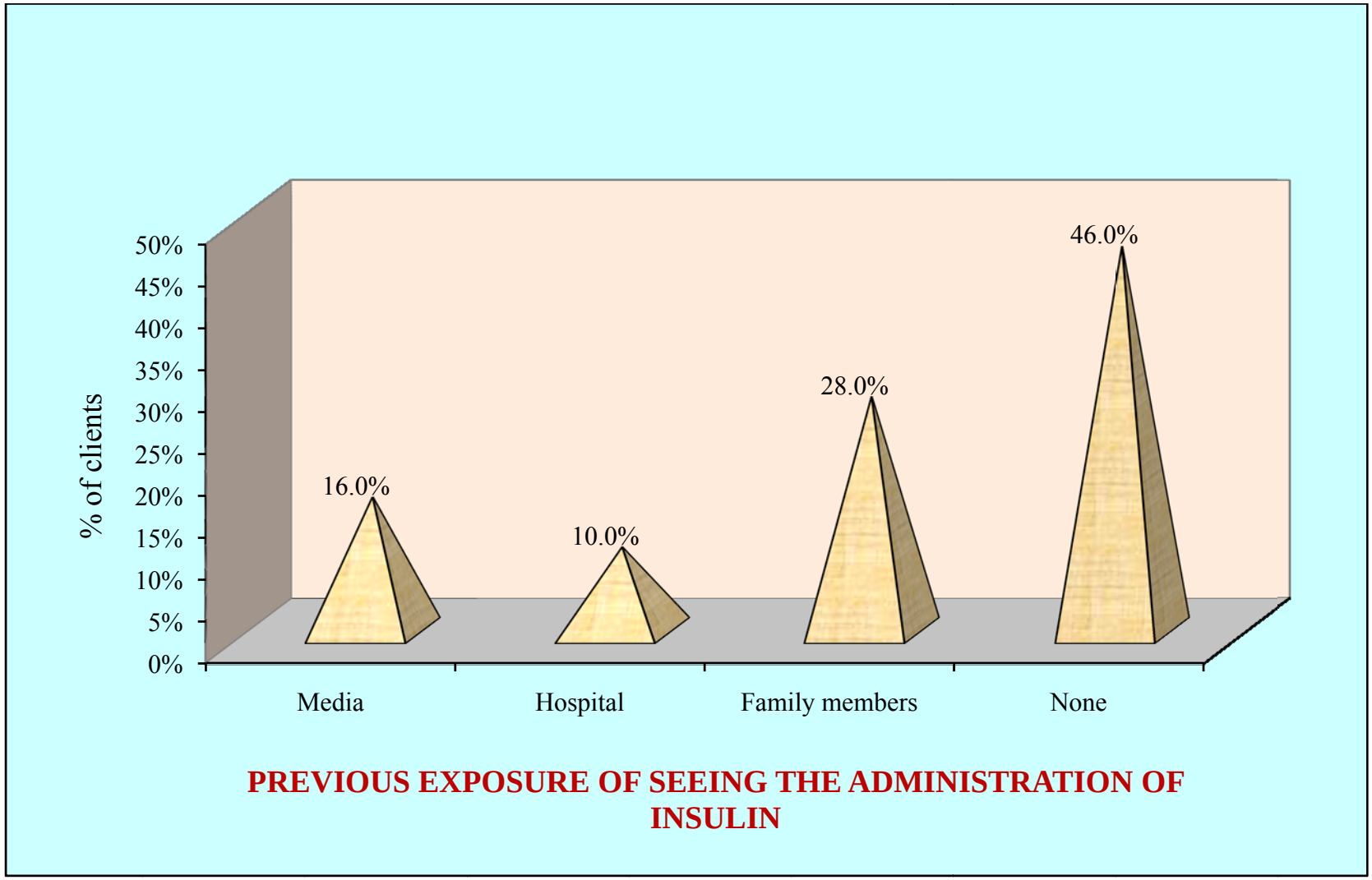
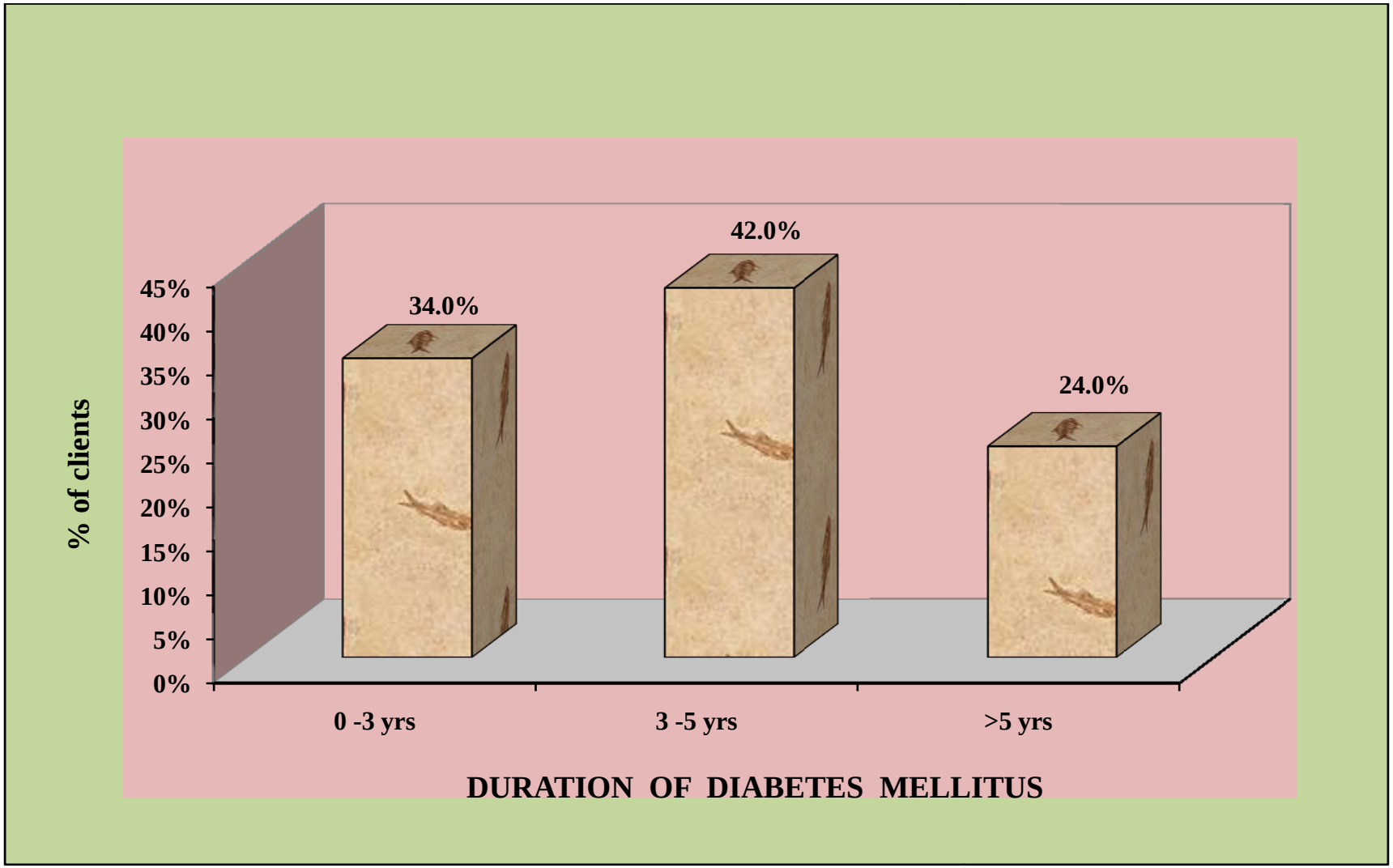


Fig. 7: PERCENTAGE DISTRIBUTION OF DURATION OF DIABETES MELLITUS.



***Objective 1**: To assess the level of knowledge and practice in self administration of insulin among client with diabetes mellitus*

TABLE 3: DOMAIN WISE PRETEST PERCENTAGE SCORE OF KNOWLEDGE IN SELF ADMINISTRATION OF INSULIN.

N = 50

Domains	No. of questions	Min –Max score	Knowledge score	
			Mean ± SD	%
General information on DM	10	0 -10	3.74±1.14	37.4%
Self administration of Insulin	34	0 – 34	12.18±4.17	35.8%
Overall	44	0 – 44	15.92±4.21	36.2%

Above table reveals that the participants have in average inadequate knowledge in both knowledge on diabetes mellitus and self administration of insulin.

TABLE 4: PRETEST LEVEL OF KNOWLEDGE IN SELF ADMINISTRATION OF INSULIN

N = 50

Level	General information	Self administration
In adequate knowledge	38(76.0%)	40(80.0%)
Moderately adequate knowledge	12(24.0%)	10(20.0%)
Adequate knowledge	0(0.0%)	0(0.0%)
Total	50	50

It is clear from the above table that majority of the participants have inadequate knowledge, some of them have moderately adequate knowledge and none of them have adequate knowledge. (0-50% inadequate knowledge, 51-75% moderately adequate knowledge, and 76-100% adequate knowledge)

TABLE 5: OVERALL PRETEST LEVEL OF KNOWLEDGE

N=50

Knowledge	Number of clients	Percentage(%)
In adequate knowledge	39	78.0%
Moderately adequate knowledge	11	22.0%
Adequate knowledge	0	0.0%

The table shows that overall majority of the participants have inadequate knowledge and some of them have moderately adequate knowledge and none of them have adequate knowledge.

TABLE 6: EACH DOMAINWISE PRETEST PERCENTAGE OF PRACTICE

N = 50

Domains	No. of questions	Min –Max score	Practice score	
			Mean±SD	%
Preliminary Procedures	7	0 -7	3.18±0.72	45.4%
Drawing Insulin (Single)	8	0 – 8	3.02±0.96	37.8%
Drawing Mixing Insulin	8	0 – 8	2.98±0.82	37.3%
Procedure for injecting Insulin	7	0 -7	2.60±0.63	37.1%
After care	2	0 -2	0.76±0.43	38.0%
Overall	32	0 – 32	12.54±2.28	39.2%

It is clear from the table in all domains of practice participants have inadequate knowledge. (0-50% inadequate practice, 51-75% moderately adequate practice, 76-100% adequate practice).

TABLE 7: OVERALL PRETEST LEVEL OF PRACTICE

N = 50

Practice	Number of Clients	Percentage (%)
In adequate practice	37	74.0%
Moderately adequate practice	13	26.0%
Good practice	0	0.0%

When considering the practice, the above table reveals that majority of the participants have inadequate practice, only 26% of them are having moderately adequate practice and none of them are having good practice.

Objective 2: To assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among client with diabetes mellitus.

Table 8: EACH DOMAINWISE POSTTEST PERCENTAGE OF KNOWLEDGE IN SELF ADMINISTRATION OF INSULIN

N = 50

Domains	No. of Questions	Min –Max score	Knowledge Score	
			Mean±SD	%
General information on diabetes mellitus	10	0 -10	8.32±1.15	83.2%
Self administration of Insulin	34	0 – 34	27.00±3.85	79.4%
Overall	44	0 – 44	35.32±4.10	80.3%

Above table reveals that in the post test on an average participants are having adequate knowledge on both domains of knowledge with mean score of 80.3%t (76%-100%=adequate knowledge).

Table 9: POSTTEST LEVEL OF KNOWLEDGE IN SELF ADMINISTRATION OF INSULIN

N = 50

Level	General information	Self administration
In adequate knowledge	0 (0.0%)	0 (0.0%)
Moderately adequate knowledge	11 (22.0%)	13 (26.0%)
Adequate knowledge	39 (78.0%)	37 (74.0%)
Total	50	50

Table.9 shows that in post test in general information and self administration domains of knowledge most of them are having adequate knowledge (78.00% and 74% respectively), some of them are having moderately adequate knowledge (22.0% and 26% respectively). None of them are having inadequate knowledge in both domains.

TABLE 10: OVERALL POSTTEST LEVEL OF KNOWLEDGE

N = 50

Knowledge	Number of clients	Percentage (%)
In adequate knowledge	0	0.0%
Moderately adequate knowledge	12	24.0%
Adequate knowledge	38	76.0%

Above table shows that after educational intervention most of them (76%) are having adequate knowledge and 24.0% of them having moderate knowledge and none of them having inadequate knowledge.

TABLE 11: EACH DOMAINWISE POSTTEST PERCENTAGE OF PRACTICE

N = 50

Domains	No. of questions	Min –Max score	Practice score	
			Mean±SD	%
Preliminary Procedures	7	0 -7	5.92±0.70	84.6%
Drawing Insulin(Single)	8	0 – 8	5.78±1.12	72.3%
Drawing Mixing Insulin	8	0 – 8	6.42±1.31	80.3%
Procedure for injecting Insulin	7	0 -7	6.40±0.78	91.4%
After care	2	0 -2	1.66±0.52	83.0%
Overall	32	0 – 32	26.18±2.59	81.8%

It is clear from the above table that after educational intervention the participants have good mean score in all domains of practice with overall average score of 81.8% of self administration of insulin.

TABLE 12: OVERALL POSTTEST LEVEL OF PRACTICE

N = 50

Practice	Number of clients	Percentage (%)
In adequate practice	**0**	**0. 0%**
Moderately adequate practice	**10**	**20.0%**
Good practice	**40**	**80.0%**

Table 12 shows after education intervention most (80.0%) of the participants have good practice and 20.0% of them have moderately adequate practice and none of them having inadequate practice.

Objective 3: To compare the pre-test and post-test level of knowledge and practice in self administration of insulin among clients with diabetes mellitus.

Table 13: COMPARISON OF KNOWLEDGE SCORE

N= 50

	Group				**Student's paired t-test**
	Pre test		**Post test**		
	Mean	**SD**	**Mean**	**SD**	
General information	3.74	1.14	8.32	1.15	t=20.34 , P=0.001*** DF=98, significant
Self administration	12.18	3.92	27.00	3.85	t=21.56 , P=0.001*** DF=98, significant
Overall	15.92	4.22	35.32	4.10	t=24.91 , P=0.001*** DF=98, significant

Note: * significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

Above table shows that there is significant improvement in the knowledge score from pretest to post test (t=24.91, p=0.001with DF=98). This difference between pre-test and post-test is large and it is statistically significant (Fig. 8).

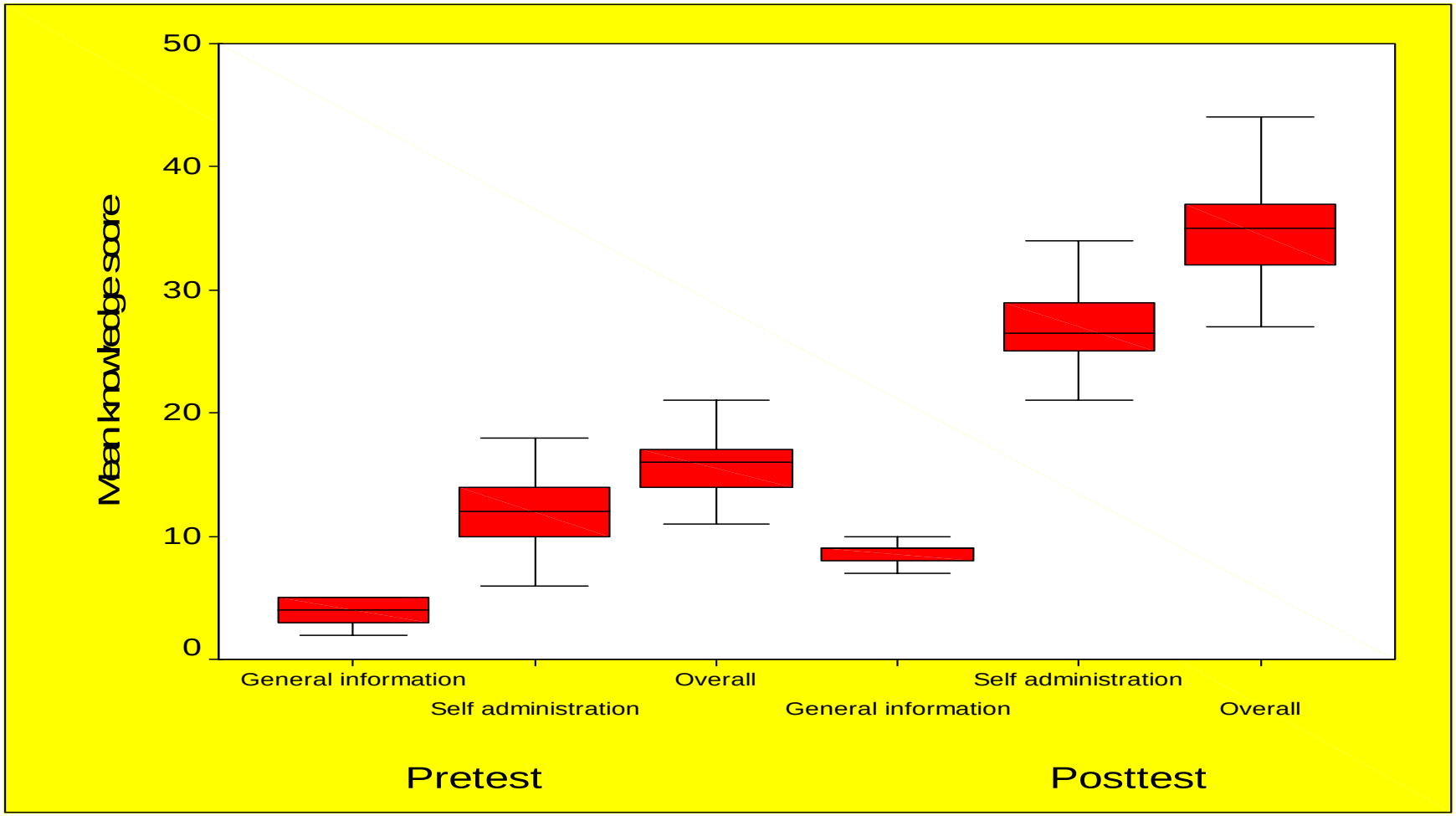


Fig.8: Box Plot Comparison of pretest and posttest mean knowledge score in self administration of insulin.

TABLE 14: COMPARISON OF LEVEL OF KNOWLEDGE SCORE

N = 50

Level	Pre-test	Post-test	Pearson chi-square test
In adequate knowledge	39(78.0%)	0(0.0%)	**$\chi 2$=77.04 P=0.001*** DF= 2 significant**
Moderately adequate knowledge	11(22.0%)	12(24.0%)	
Adequate knowledge	0(0.0%)	38(76.0%)	
Total	50	50	

Note: * significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

Table 14 shows that before educational intervention most (78.0%) of participants were having inadequate knowledge and 22.0% of them having moderately adequate knowledge and none of them having adequate knowledge.

But after intervention most (t76.0%) of participants are having adequate knowledge and 24.0% of them having moderate knowledge and none of them having inadequate knowledge (Fig. 9).

Fig. 9: PERCENTAGE DISTRIBUTION OF COMPARISON OF PRETEST AND POST TEST LEVEL OF KNOWLEDGE.

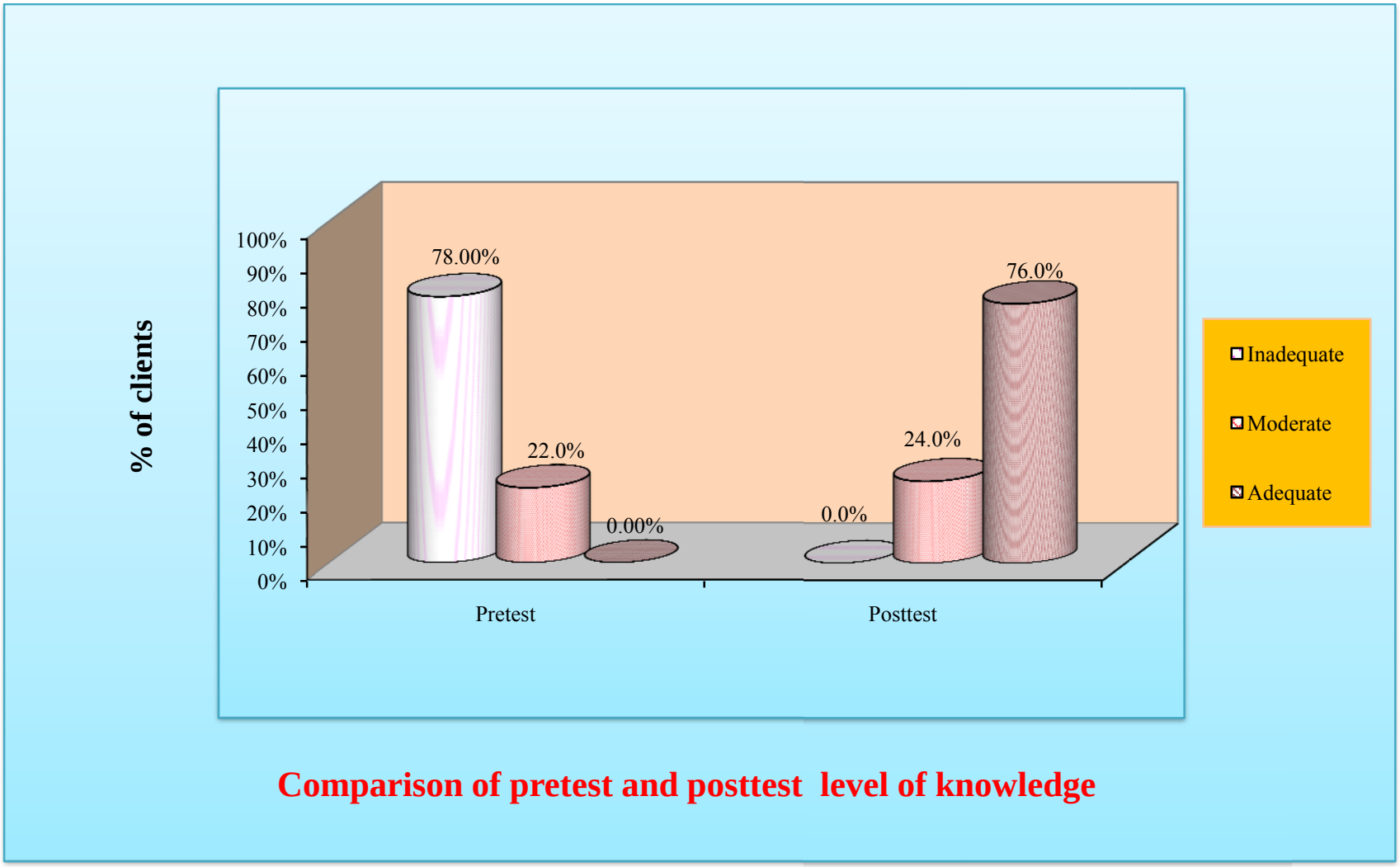


Table 15: COMPARISON OF PRACTICE SCORE

N = 50

	Group				Student's paired t-test
	Pre-test		Post test		
	Mean	SD	Mean	SD	
Preliminary Procedures	3.18	0.72	5.92	0.70	t=30.61 , P=0.001*** DF=98, s**ignificant**
Drawing Insulin(Single)	3.02	0.96	5.78	1.11	t=35.80 , P=0.001*** DF=98, **significant**
Drawing Mixing Insulin	2.98	0.82	6.42	1.31	t=25.01 , P=0.001*** DF=98, **significant**
Procedure for injecting Insulin	2.60	0.64	6.40	0.78	t=44.33 , P=0.001*** DF=98, **significant**
After care	0.76	0.43	1.66	0.52	t=10.35 , P=0.001*** DF=98, **significant**
Overall	12.54	2.28	26.18	2.59	t=55.51, P=0.001*** DF=98**, significant**

Note: * significant at $P \leq 0.05$ ** highly significant at $P \leq 0.01$ *** very high significant at $P \leq 0.001$

Above Table makes it clear that in overall Diabetes Mellitus clients are having 12.54 score in pre-test whereas after intervention they scored 26.18, so the difference is 13.64. This difference between pretest and posttest is large and it is statistically significant and it is due to educational intervention (Fig. 10).

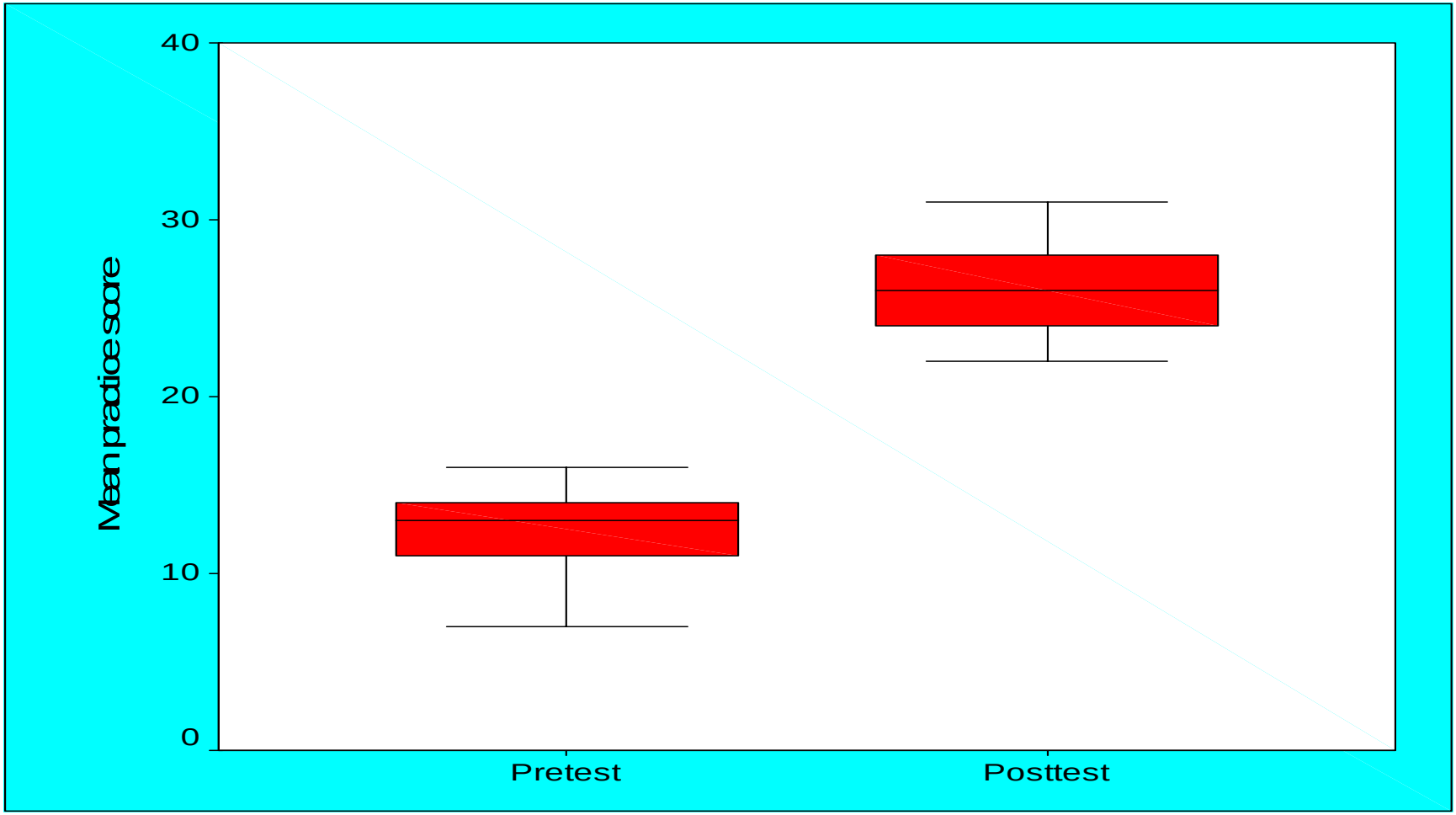


FIG.10: BOX PLOT COMPARISON OF PRETEST AND POSTTEST MEAN LEVEL OF PRACTICE SCORE IN SELF ADMINISTRATION OF INSULIN

TABLE 16: COMPARISON OF LEVEL OF PRACTICE SCORE

N = 50

Level	Pre-test	Post-test	Pearson chi-square test
In adequate practice	37(74.0%)	0(0.0%)	**$\chi 2$=77.39 P=0.001*** DF= 2 significant**
Moderately adequate practice	13(26.0%)	10(20.0%)	
Good practice	0(0.0%)	40(80.0%)	
Total	50	50	

Note: * significant at P ≤ 0.05 ** highly significant at P ≤ 0.01 *** very high significant at P ≤ 0.001.

Above table reveals that the practice score of diabetes mellitus clients increased after Educational intervention ($\chi 2$=77.39, P=0.001*** DF= 2 significant) (Fig. 11)

Table 17: EFFECTIVENESS OF EDUCATIONAL INTERVENTION

N = 50

	Pretest	Posttest	% of gain
Knowledge	36.2%	80.3%	44.1%
Practice	39.2%	81.8%	42.6%

It is clear from the above table that after intervention both knowledge and practice score is increased with percentage gain of $$.1% and 42.6% respectively.

Fig.11: PERCENTAGE DISTRIBUTION OF COMPARISON BETWEEN PRETEST AND POSTTEST LEVEL OF PRACTICE SCORE.

Objective 4: To correlate between the post-test level of knowledge and practice in self administration of insulin among client with diabetes mellitus.

Table 18: CORRELATION BETWEEN KNOWLEDGE AND PRACTICE

N = 50

		Mean ± SD	Karl Pearson correlation coefficient	Interpretation
Pretest	Knowledge practice	12.28±4.73 12.36±2.57	r=0.19 P=0.21	**Not significant**, positive , poor correlation between knowledge and practice It means when knowledge increases their practice score also increases poorly
Posttest	Knowledge practice	29.14±4.85 26.18±2.59	r=0.63 P=0.001***	**Significant,** positive, substantial correlation between knowledge and practice. It means when knowledge increases their practice score also increases substantially

Note: * significant at P ≤ 0.05 ** highly significant at P ≤ 0.01 *** very high significant at P ≤ 0.001

Interpretation for r-value

Pearson correlation coefficient is denoted by "r"

"r" always lies between -1 to +1

0.0 – 0.2 poor correlation

0.2 - 0.4 fair correlation

0.4 - 0.6 moderate correlation

0.6 – 0.8 substantial correlation

0.8 - 1.0 strong correlation

Above table correlates between knowledge and practice score and shows that in pre test there is no much correlation exist between knowledge and practice before intervention (r=0.19 P = 0.21). But after intervention much correlation exist between knowledge and practice score (r = 0.63 P = 0.001***) which means that the practice increases with increase in knowledge (Fig. 12).

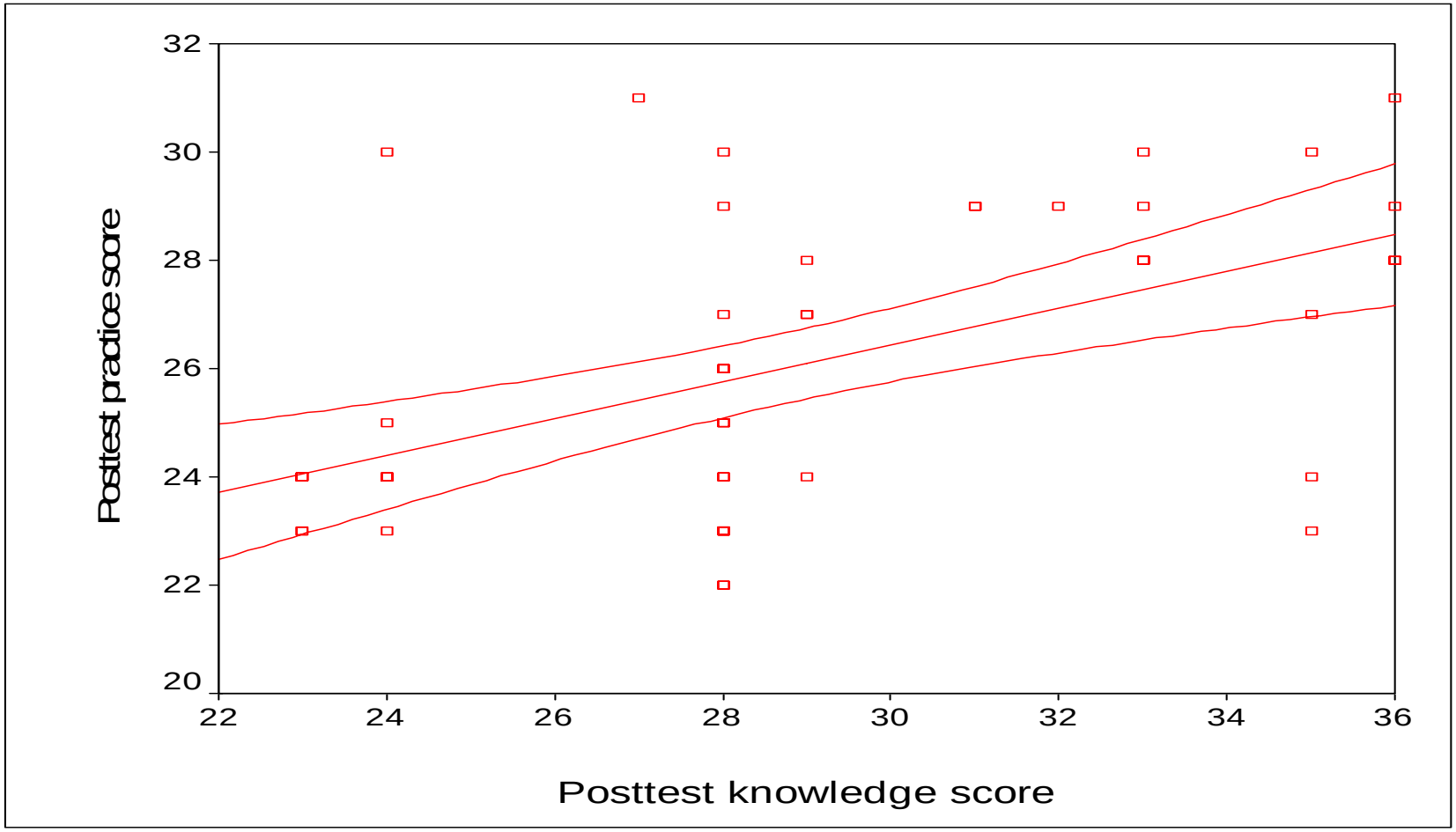


FIG. 12: SCATTER DIAGRAM WITH REGRESSION ESTIMATE SHOWS THE SUBSTANTIAL CORRELATION BETWEEN KNOWLEDGE AND PRACTICE SCORE (R =0.63, P = 0.001)

Objective 5: To associate the post test level of knowledge and practice in self administration of insulin with selected demographic variables of client with diabetes mellitus.

Table 19: ASSOCIATION BETWEEN POST TEST LEVEL OF KNOWLEDGE AND DEMOGRAPHIC VARIABLES

N = 50

Demographic variables		**Posttest level of knowledge**				**Total**	**Pearson chi-square test**
		Moderate		**Good**			
		n	**%**	**n**	**%**		
Age	30 -35 yrs	10	41.7%	14	58.3%	24	**$\chi 2=8.34$ P=0.02* DF= 2 significant**
	36 - 45 yrs	2	11.7%	15	88.3%	17	
	> 45 yrs	0	0.0%	9	100.0%	9	
Education status	Illiterate	5	62.5%	3	37.5%	8	**$\chi 2=8.57$ P=0.01** DF= 2 significant**
	Primary/middle	6	20.7%	23	79.3%	29	
	HSc/Diploma/Degree	1	7.7%	12	92.3%	13	
Family history of DM	Yes	1	5.6%	17	94.4%	18	**$\chi 2=5.25$ P=0.01* DF= 2 significant**
	Nil	11	34.3%	21	65.7%	32	

Table No. 19 shows that elders, more educated and family history of DM clients are having more knowledge than others. (Fig. 13)

Fig. 13(a): PERCENTAGE DISTRIBUTION OF ASSOCIATION BETWEEN POSTTEST LEVEL OF KNOWLEDGE AND AGE.

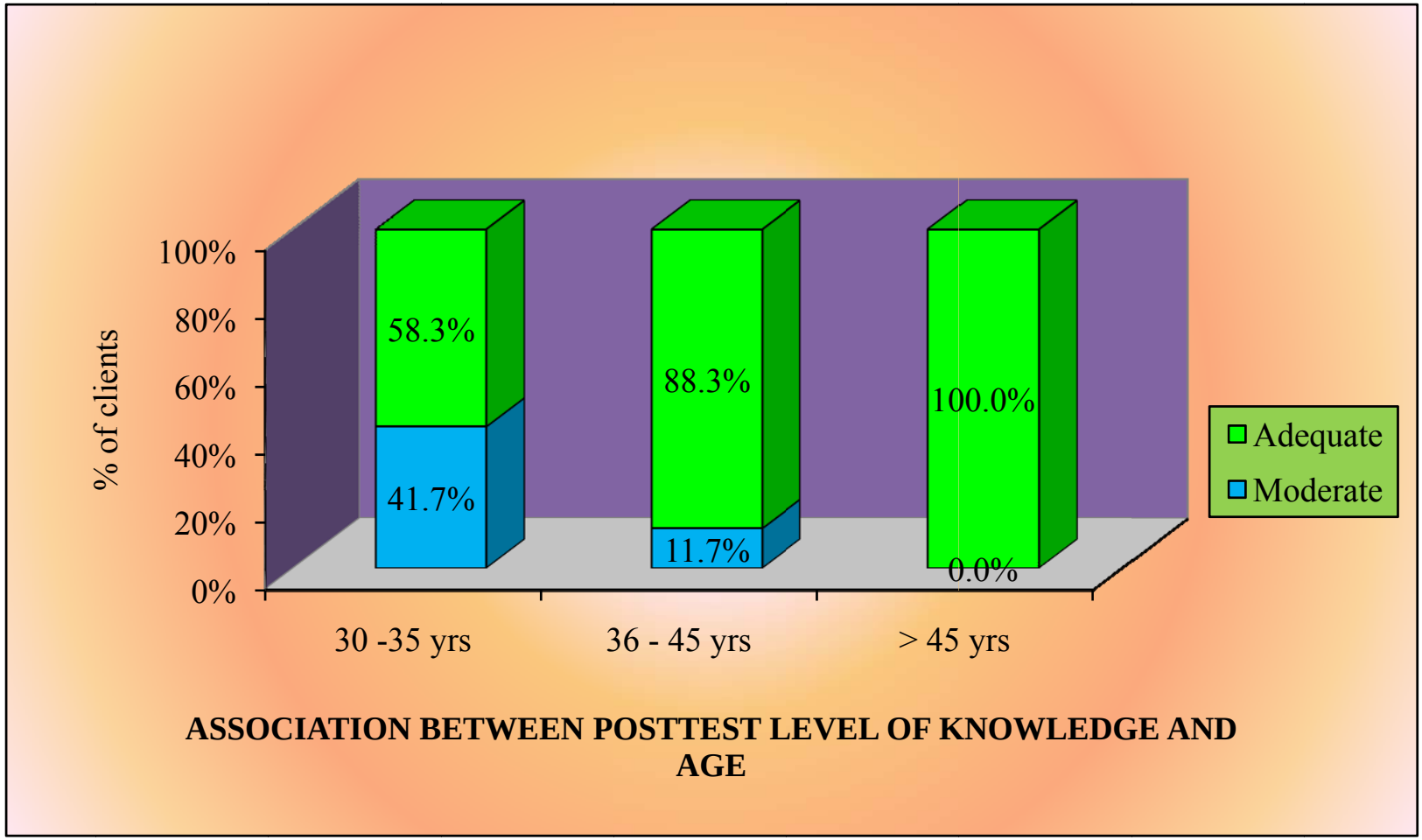


Fig. 13(b): PERCENTAGE DISTRIBUTION OF ASSOCIATION BETWEEN POSTTEST LEVEL OF KNOWLEDGE AND EDUCATION STATUS.

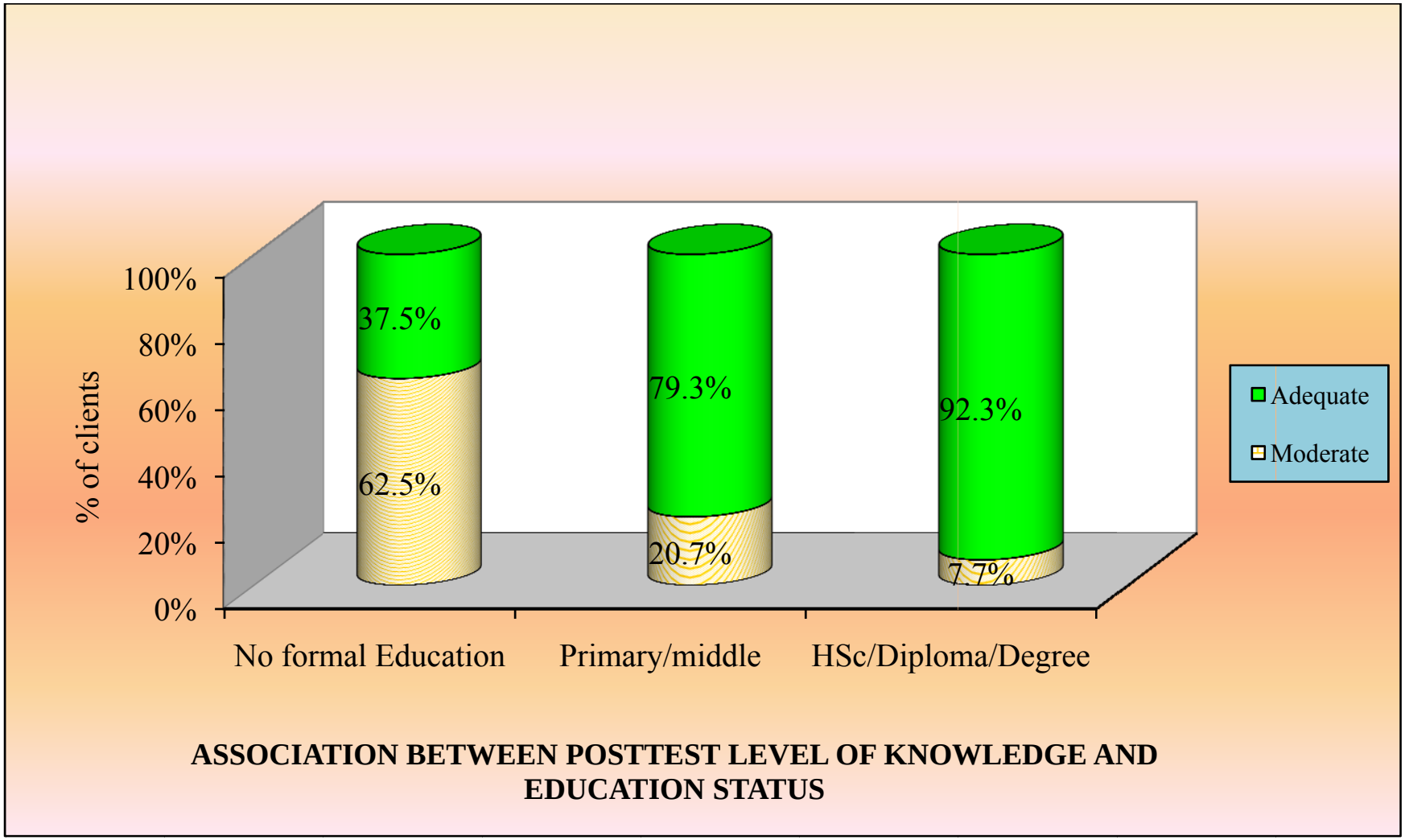
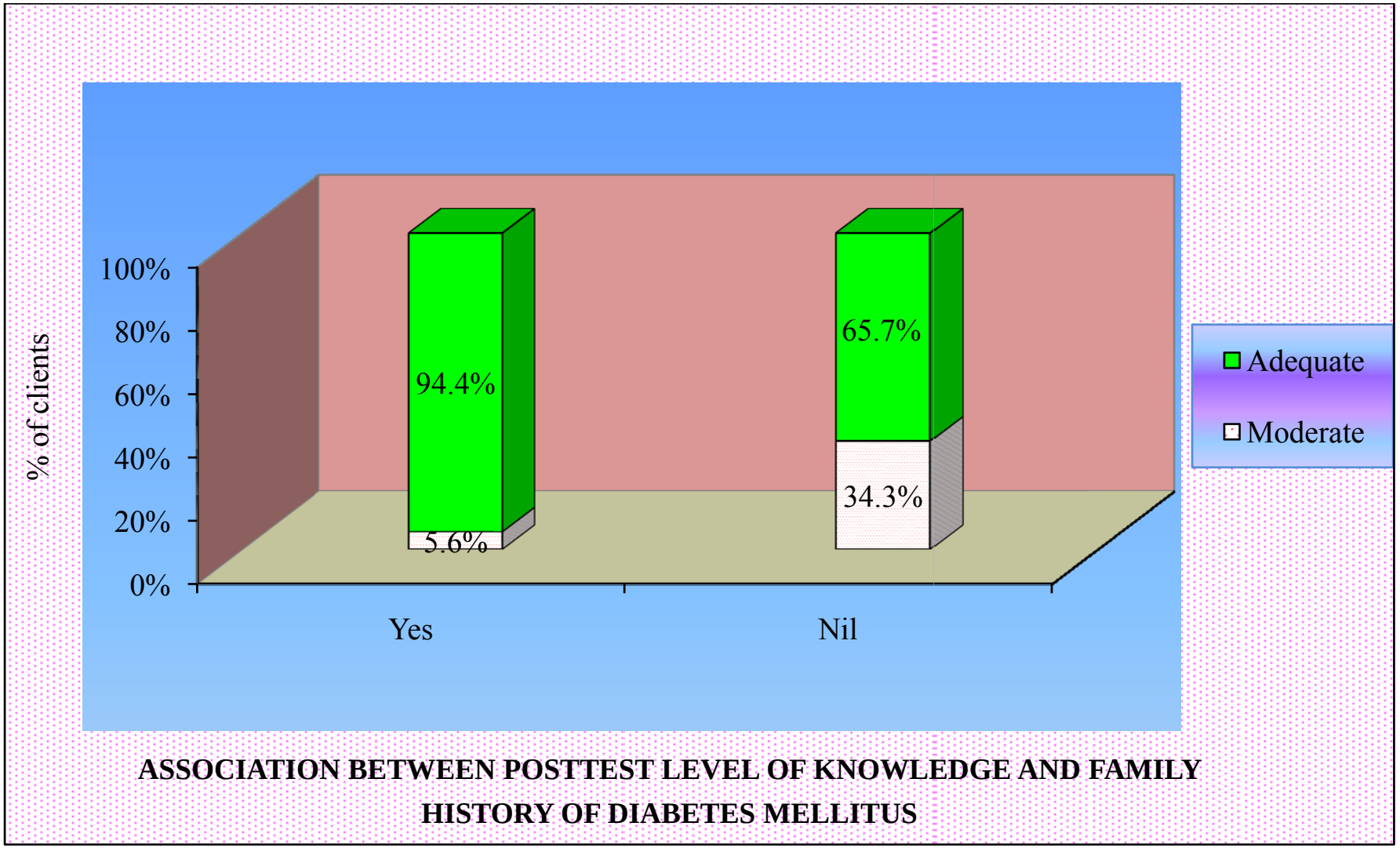


Fig. 13(c): PERCENTAGE DISTRIBUTION OF ASSOCIATION BETWEEN POSTTEST LEVEL OF KNOWLEDGE AND FAMILY HISTORY OF DIABETES MELLITUS.



ASSOCIATION BETWEEN POSTTEST LEVEL OF KNOWLEDGE AND FAMILY HISTORY OF DIABETES MELLITUS

Table 20: ASSOCIATION BETWEEN POSTTEST LEVEL OF PRACTICE AND DEMOGRAPHIC VARIABLES

N=50

Demographic variables		Level of practice				Level of practice	Pearson chi square test
		Moderate		Good			
		n	%	n	%		
Age	30 -35 yrs	9	37.5%	15	62.5%	24	**$\chi 2$=6.93 P=0.03* DF= 2 significant**
	36 - 45 yrs	2	11.8%	15	88.2%	17	
	> 45 yrs	0	0.0%	9	100.0%	9	
Education status	Illiterate	4	50.0%	4	50.0%	8	**$\chi 2$=7.40 P=0.02* DF= 2 significant**
	Primary/middle	7	24.1%	22	75.9%	29	
	HSc/Diploma/Degree	0	0.0%	13	100.0%	13	
Duration of having DM	0 -3 yrs	7	41.1%	10	58.9%	17	**$\chi 2$=7.13 P=0.03* DF= 2 significant**
	3 -5 yrs	4	19.0%	17	81.0%	21	
	>5 yrs	0	16.7%	12	83.3%	12	

Table No. 20 shows that elders more educated and more years of duration of illness are having more practice than others.

From this data analysis it is clearly understood that educational intervention improved the knowledge about diabetes mellitus and practice on self administration of insulin of clients with Diabetes Mellitus. (Fig. 14).

Fig. 14(a). PERCENTAGE DISTRIBUTION OF ASSOCIATION BETWEEN POSTTEST LEVEL OF PRACTICE AND AGE.

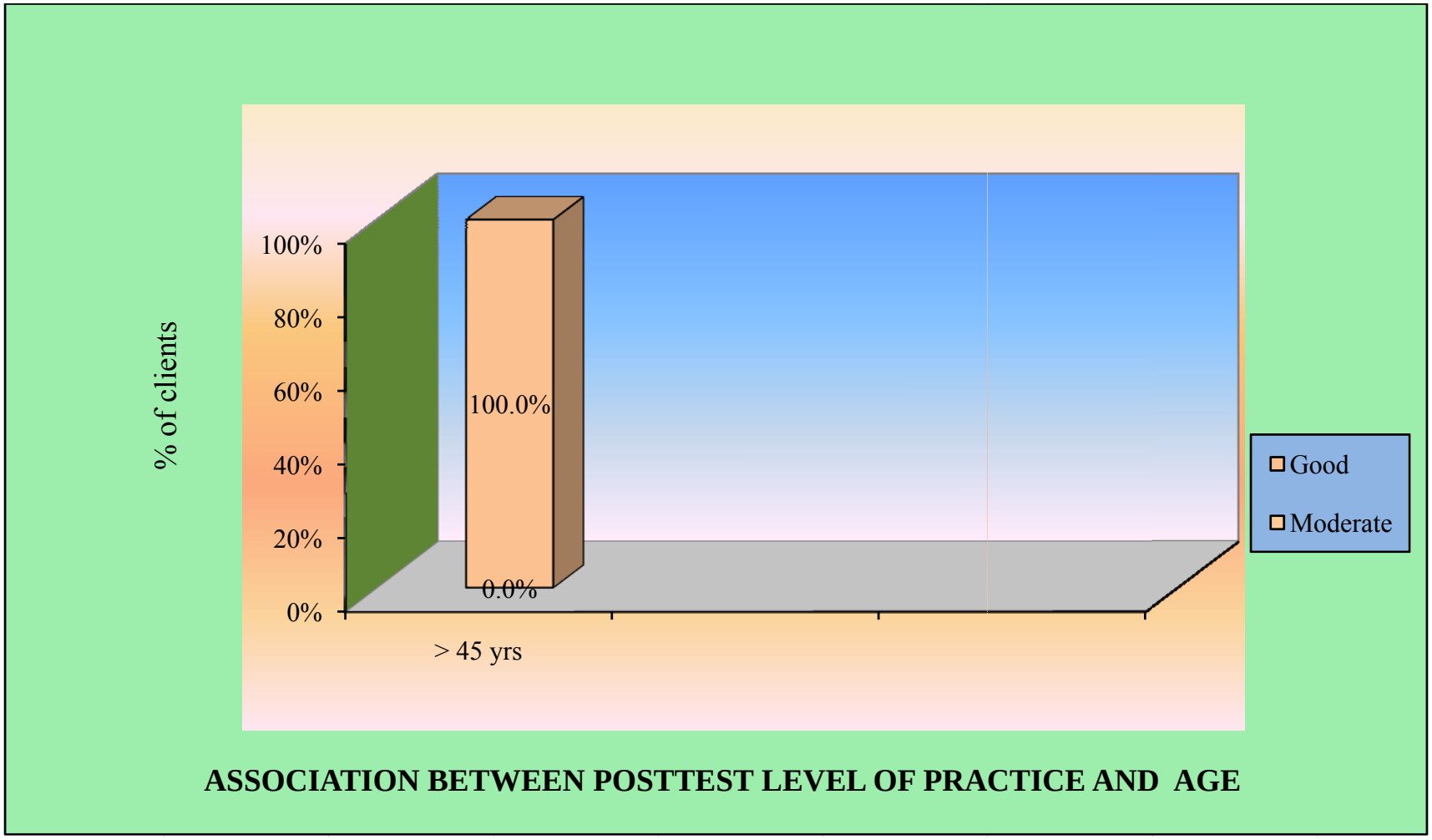


Fig. 14(b): PERCENTAGE DISTRIBUTION OF ASSOCIATION BETWEEN POSTTEST LEVEL OF PRACTICE AND EDUCATION STATUS.

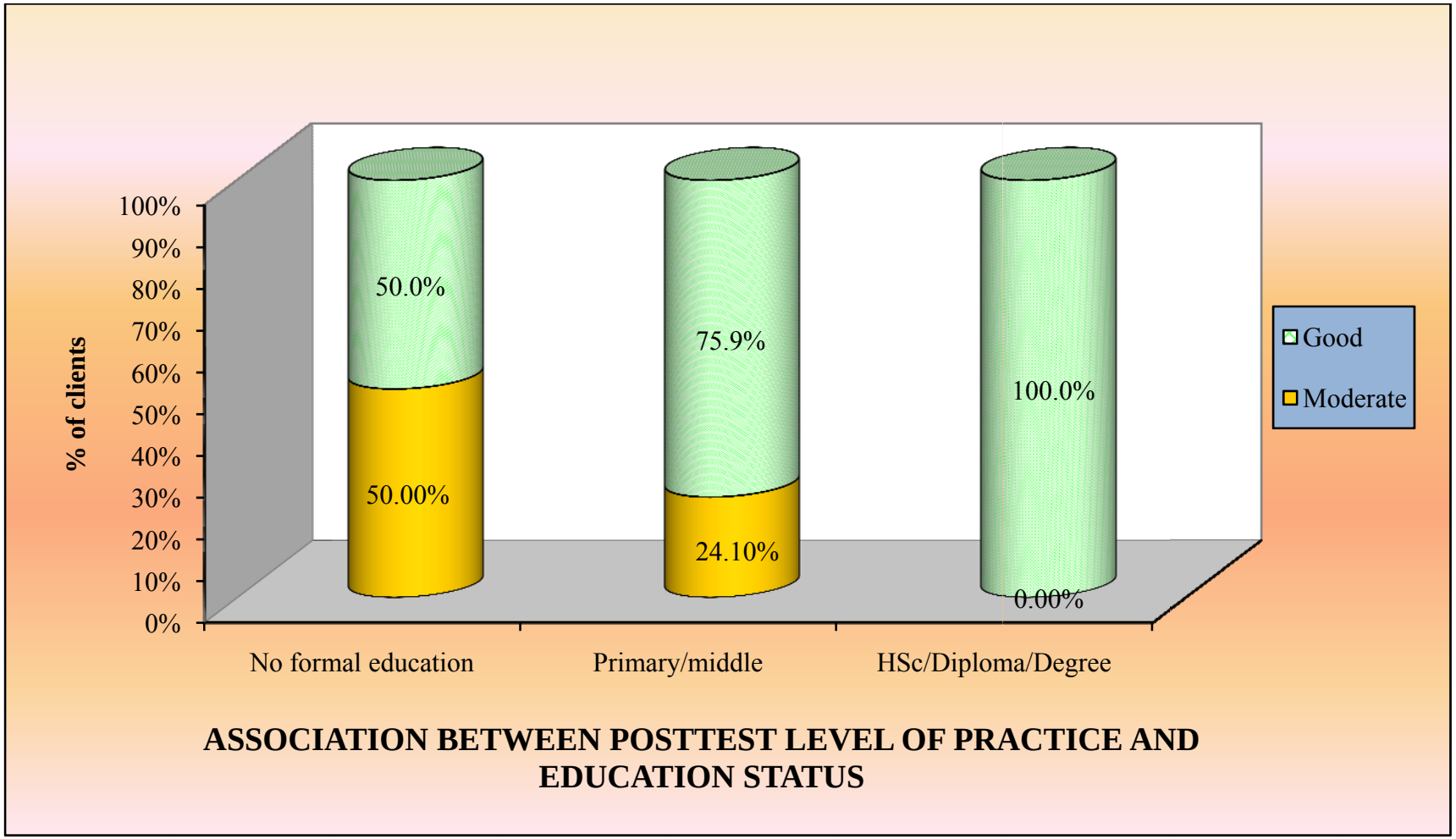
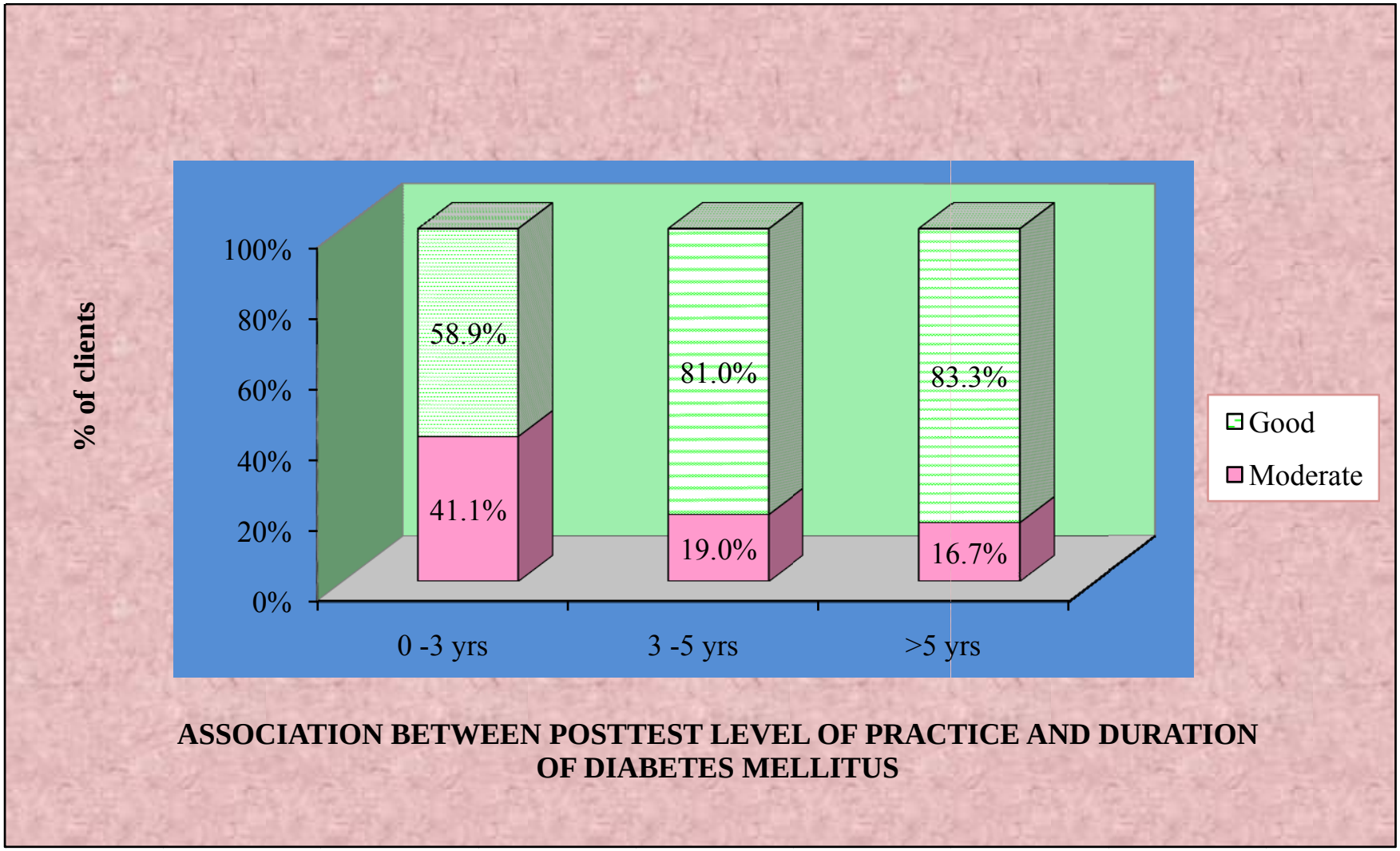


Fig. 14(c): PERCENTAGE DISTRIBUTION OF ASSOCIATION BETWEEN POST TEST LEVEL OF PRACTICE AND DURATION OF DIABETES MELLITUS.



CHAPTER-V

DISCUSSION

This chapter concentrates on the findings of this study derived from the statistical analysis and its pertinence to the objectives set for the study. The study has described the "Effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus attending Diabetology outpatient department, Government Rajaji Hospital, Madurai-20". Fifty Clients between age group of 30 and 50 years with Diabetes Mellitus were selected by Simple Random Sampling - by Lottery Method, and assigned to study group on the basis of inclusion criteria. Semi-structured interview/observation schedule was used to gather information from the participants with diabetes mellitus.

Level of knowledge and practice in self administration of insulin of clients with diabetes mellitus was assessed before intervention. Then educational intervention about general information on self administration of insulin carried out using power point presentation, flip charts. Technique of administration of subcutaneous insulin injection was demonstrated. Pamphlet was also used for information about proper insulin injection technique. Post intervention knowledge and practice on self administration was assessed after 7 days using the same questionnaire and observation check list. Data collection was done in one month duration from 16 November 2010 to 15 December 2011, with permission of Head of Department and approval of Institutional Ethical Committee.

The collected data were classified into three sections; Socio-economic and demographic data, knowledge and practice score on self administration of insulin. Data was verified and entered in the computer for processing.

Study result shows that most of the participants are in below 45 years of age group (82%). Both male and female participated in the study (54% and 46% respectively). This shows that both genders are affected equally. Majority of the participants had education up to middle school level (38%), and 18% of them received up to higher secondary level. Only 2% of them had diploma level education and 6% of them had degree level education and some of them had no formal education (16%).

Educational status play important role in knowledge and understanding of the clients about disease and its management. Majority of the participants are either unemployed or house wives (36%). Among employed participants, clerks (6%), skilled workers (4%), and unskilled workers (26%), remaining 22% are agricultural workers, and some of them do business (6%). Most of the participants monthly income fall below rupees four thousand per month (82%). Only 18% of them more than four thousand rupees monthly income. Most of the participants are married (86%), widower constitutes 6% of participants and some of them are Unmarried (8%). When researcher enquired about reasons for unmarried status they pointed out their Type I diabetes mellitus status and fear of complications.

Most of the participants are from Madurai urban (62%) and remaining (38%) from rural area surrounding Madurai city. So they have easy access to health care facility. Most of the participants are Non vegetarians (80%). Regarding family history of diabetes mellitus most of the client's parents suffer with diabetes mellitus (mother 26%, father 6%), and also grand parents and siblings suffering with diabetes mellitus (2% and 2% respectively). But 64% of them have no family history of diabetes mellitus. Family history of Diabetes mellitus also a factor for level of knowledge and practice of clients. Regarding previous exposure to information on diabetes mellitus and self administration of insulin, they get some information through-family members (28%), media (16%), hospital (10%), and 46% have no previous exposure of receiving information. This suggests that there is need for proper education of clients in their self management.

Most of the clients participated in the study have duration of illness less than 5 years (76%), 24% are suffering for more than 5 years of duration.

The first objective of the study is to assess the level of knowledge and practice in self administration of insulin among client with diabetes mellitus.

The investigator used the semi-structured observation /interview schedule to collect data on knowledge of participants which consisted in domains-general information on diabetes mellitus and self administration of insulin including meaning, types, storage, administration techniques and complications of insulin therapy.

The findings of the study show that overall level of knowledge of participants is inadequate. The mean knowledge score on general information on diabetes mellitus and self administration of insulin is inadequate (37.4% and 35.8%respectively). Some of them have moderately adequate score in general information on diabetes mellitus and self administration (76.0% and 24.0% respectively). None of them have adequate score of knowledge in both domains. Overall mean knowledge score for both domains is 36.2% only. Over all 78% of the participants have inadequate knowledge, and 22% of participants have moderately adequate knowledge.

Investigator assessed the level of practice on self administration of insulin using semi-structured observation check list. Practice for preliminary procedure, drawing of single insulin, drawing and mixing of insulin types, procedure of injecting insulin and after care.

The result shows that overall the participants have inadequate practice. They have maximum practice in preliminary procedures (45.4%) and minimum practice in procedure for injecting insulin (37.1%). Overall they have inadequate practice (39.2%). Most of them (74.0%) have inadequate practice on self administration of insulin and some of them (26.0%) have moderately adequate practice and none of them have good practice. These findings are supported by similar studies conducted earlier. Leona, V. conducted a study and found out that that almost half of the patients who claimed to have attended training programs could not demonstrate adequate knowledge or skills in any of the major areas of self care: insulin administration and management of hypoglycemia or hyperglycemia. Another study conducted by **Newman, K.D. et.al.** to measure the ability and prepare insulin in a syringe and noted that 48% did not roll vial, mix it properly, 7% did not eliminate air bubbles from the syringe and 23% contaminated the regular insulin. **Aust et.al.** found out that medication knowledge and self management were inadequate among Type II diabetes clients and fear that it could lead to adverse events.

Therefore statistically these results suggest that there is inadequate knowledge (0%-50%) on diabetes mellitus and practice on self administration of insulin among clients with diabetes mellitus. So, H_1-There will be significant gap in level of knowledge and practice in self administration of insulin among clients with diabetes mellitus is proved.

The second objective is to assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus.

In present study overall post test level of knowledge is adequate (mean score is 80.3%). Mean knowledge score on general information on diabetes mellitus and self administration of insulin is adequate (83.2% and 79.4% respectively). In considering the level of knowledge of participants most of them have adequate knowledge level (74.0%), some of them have moderately adequate knowledge level (13%) and none of them have inadequate knowledge level. 76% of the participants have adequate knowledge and 24% of them have moderately adequate knowledge and none of them have inadequate knowledge. When pretest and post test level of knowledge is compared the difference is great (t=24.91, p=0.001***, DF=98, significant).

When considering the post test practice level overall the mean score is good (81.8%). They have maximum practice in procedure for injecting insulin (91.4%), and minimum practice in drawing single insulin (72.3%). Most of the participants (80.0%) have good practice and only few of them (20.0%) have moderately adequate practice and none of them have inadequate practice. This finding is consistent with findings of a study conducted by **Shaini, G.S. et.al.,** in post test 30% of participants had moderately adequate knowledge and 70% with adequate knowledge. When pre and post test level of practice is compared the difference is great (t=55.51, p=0.001***, DF= 98, significant).

Therefore, statistically these results suggest that there is improvement in level of knowledge and practice on self administration of insulin (from 0%-50% to 76.0%-100%) among diabetes clients after educational intervention.

Therefore, H_2-There will be significant difference in the pre-test and post-test level of knowledge and practice in self administration of insulin among clients with diabetes mellitus is proved.

The third objective is to compare the pre-test with post-test level of knowledge and practice in self administration of insulin among clients with diabetes mellitus.

Pre test knowledge and practice scores are compared. Pretest mean knowledge score on general information on diabetes mellitus is 3.74 and post test score is 8.32, the difference is 4.58. This difference is great and is due to educational intervention (t=20.34, p=0.001, DF=98, significant).

Pre test mean knowledge score on self administration of insulin is 12.18 and post test score is 27.0, the difference is 14.82. This difference between pretest and post test is great and is statistically significant (t=21.56, p=0.001***, DF=98, significant). When overall pre test mean knowledge scores on diabetes mellitus is 15.92 and post test score is 35.32, the difference is large 19.40. This difference is great and statistically significant (t=24.91, p=0.001***, DF=98, significant). In pre test 78.0% of participants had inadequate knowledge, and 22.0% had moderately adequate knowledge and none of them had adequate knowledge. In post test 76.0% of participants are having adequate knowledge and 24.0% are having moderately adequate knowledge and none of them have inadequate knowledge. When pre and post test level of practice is compared the difference is great (t=55.51, p=0.001***, DF= 98, significant). These finding is consistent with findings of a study conducted by Shaini, G.S. et.al. after education in post test 30% of participants had moderately adequate knowledge and 70% with adequate knowledge. In pretest 60% had inadequate knowledge and 36% had moderately adequate knowledge.

Considering the practice score on self administration of insulin overall mean score in pre test score is 12.54 and post test score is 26.18, the difference is 13.64, and is statistically significant (t=55.51, p=0.001***, DF=98, significant).

Pre and post test practice scores of all domains are compared and statistically significant difference exists. In pre test 74.0% of the participants had inadequate practice, 13.0% had moderately adequate practice, and none of them had good practice. In post test 80.0% are having good practice, 20.0% are having moderately

adequate practice and none of them have inadequate practice. This improvement is significantly great (X^2=77.39, p=0.001***, DF=2, significant). The findings of study conducted to describe the most common correct, incorrect self administration techniques for insulin, by using disposable syringes by **Santos, T. et.al** is consistent with present study. The authors found that the average scores of steps correctly performed during the insulin preparation and administration technique was 61%.

Leona, V. conducted a study and found out that almost half of the patients who claimed to have attended training programs could not demonstrate adequate knowledge or skills in any of the major areas of self care: insulin administration and management of hypoglycemia or hyperglycemia. While patients with training were more knowledgeable than patients without training, the difference was slight.

This statistical information shows the net benefit of the study, which indicates the effectiveness of educational intervention on knowledge on diabetes mellitus and practice on self administration of insulin. Therefore, statistically the result suggests that there is difference in pre test and post test score levels. Thus, H_2- There will be significant difference in the pre-test and post-test level of knowledge and practice in self administration of insulin among clients with diabetes mellitus is proved.

The fourth objective is to correlate between the post test level of knowledge and level of practice in self administration of insulin among client with diabetes mellitus.

The pretest level of knowledge (mean 12.28 SD ±4.73) and level of practice (mean 12.36 SD ± 2.57) on self administration of insulin was correlated (Pearson correlation coefficient r = 0.19 P=0.21), it is not significant, positive, poor correlation between knowledge and practice. This reveals that with increase in knowledge the practice does not increase. The post test level of knowledge (mean 29.14 SD ± 4.85) and level of practice (mean 26.18 SD ± 2.59) on self administration of insulin is correlated. There is significant, positive, substantial correlation between knowledge and practice (Pearson correlation coefficient r = 0.63 P = 0.001***).

This suggests that when knowledge increases their practice score also increases substantially. This finding is supported by the study conducted by **Kakou, B.** to describe the practices of patients with diabetes regard to insulin self injection techniques by structured teaching program. The results highlighted that the proper

instructions regarding self administration of insulin enhance the correct practice. The present study proves the effectiveness of educational intervention on knowledge and practice.

Therefore, statistically these results suggest that the knowledge improve the participants' skills. Thus H_3-There will be significant correlations between the post-test level of knowledge and practice in self administration of insulin among clients with diabetes mellitus are proved.

The fifth objective is to associate the posttest level of knowledge and practice in self administration of insulin with selected demographic variables of client with diabetes mellitus.

Socio-economic and demographic variables such as age, gender, sex, religion, educational status, occupation status, monthly income, marital status, place of residence, food habit, family history of diabetes mellitus, previous exposure and duration of illness are associate with post test level of knowledge and practice score of clients with diabetes mellitus.

The post test findings are significantly associated with age, education status, family history of diabetes and duration of illness. In present study elders (>45 years, Pearson Chi-square test shows =8.34, p=0.02*, DF=2, significant), more educated (HSC/Diploma/Degree, Pearson Chi-square test shows=8.57 p=0.001**, DF=2, significant), with family history of diabetes mellitus (Pearson Chi-square test=5.25, p=0.01*, DF=2, significant) are having more knowledge than others.

Elders (>45 years, Pearson Chi-square test =6.93, p=0.03*, DF= 2, significant), more educated (HSC/Diploma/Degree, Pearson Chi-square test shows=7.40, p=0.02*, DF=2, significant), with more years of duration of illness (>5 years, Pearson Chi-square test=7.13, p=0.03*, DF=2, significant) are having more practice than others. This is supported by the findings of the study conducted by **Khattab, M. et.al.** Found that longer duration of diabetes and non adherent to diabetes self-care management behaviours were associated with poor glycemic control. **Newman, K.D. et.al.** Conducted a study and found that the associated factors for ability to self care were age, and education.

Suzanne, B.J. et.al. conducted a study and found out that girls performed more accurately than boys, and older children obtained better scores than younger children. **Peyrot, M. et.al.** found that independent risk factor for insulin omission were younger age, lower income and education, Type 2 diabetes mellitus.

Therefore, statistically the results suggest that there is association between level of knowledge and practice score and selected demographic characters of patients with diabetes mellitus after educational intervention. Thus H_4 will be significant association between the post-test level of knowledge and practice in self administration of insulin with selected demographic variables.

CHAPTER VI

SUMMARY AND RECOMMENDATIONS

This chapter deals with summary, conclusions, implications, recommendations and limitations of the study.

6.1 SUMMARY OF THE STUDY

The purpose of the study was "To assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients attending Diabetology outpatient department, Government Rajaji Hospital, Madurai-20".

Diabetes mellitus is a global health problem and has a major impact on life. The physical, social and economic factors involved in the management of diabetes are a continuous strain for the health sector and the government agencies. The number of people with diabetes is expected to rise from 177 million today to 370 million in 2030 (WHO). Diabetes will become one of the world's main disablers and killers during the next 25 years (WHO).

Diabetes mellitus affects the population in general irrespective of age, sex, caste, and creed or socio economic status. Diabetes is turning into an epidemic of the 20th century and it shows no signs of abating. Diabetes is now among few leading causes of death due to decisive in most countries.

The term diabetes mellitus describes a metabolic disorder or multiple etiology characterized by chronic hyperglycemia with disturbances of carbohydrate, fat, and protein metabolism resulting from defects in insulin secretion, insulin action, or both. The effects of diabetes include long-term damage, dysfunction and failure of various organs. Diabetes mellitus may present with characteristic symptoms such as thirst, polyuria, blurring of vision, and weight loss. In its most severe forms, ketoacidosis or Non-Ketotic Hyperosmolar state may develop and lead to stupor, coma and, in absence of effective treatment, death. Often symptoms are not severe, or may be absent, and consequently hyperglycaemia sufficient to cause pathological and functional changes may be present for a long time before the diagnosis is made.

The long-term effects of diabetes mellitus include progressive development of the specific complications of retinopathy with potential blindness, nephropathy that may lead to renal failure, and/or neuropathy with risk of foot ulcers, amputation, Charcot joints, and features of autonomic dysfunction, including sexual dysfunction. People with diabetes are at increased risk of cardiovascular, peripheral vascular and cerebrovascular disease.

Insulin deficiency means there is not enough insulin being made by the pancreas due to a malfunction of their insulin producing cells. Insulin resistance occurs when there is plenty of insulin made by the pancreas (it is functioning normally and making plenty of insulin), but the cells of the body are resistant to its action which results in the blood sugar being too high.

Management of diabetes mellitus includes diet, exercise, and drugs. Drugs include oral hypoglycaemic agents and insulin therapy. Individuals' compliance with treatment is very important in managing the disease and preventing the complications. It requires knowledge and understanding on disease and management. Skills required to self care management depend on the information provided by the health care providers. Comprehensive management is necessary to effectively control the disease.

Education improves well being and quality of life. Properly designed education program not only should present facts but also should address the emotional responses to diabetes. Education improves self-care management. Diabetes education can play an important role in clarifying the treatment regimen, reinforcing the skills necessary to successfully manage diabetes, and supporting efforts to integrate self management behaviors into one's life. Importance of education and training of clients with diabetes about their treatment and to support their self management efforts to improve their glycemic control.

Due to the increased number of people with diabetes mellitus using insulin in recent years, more emphasis should be given to the standardization and improvement of insulin administration technique, focusing on properly teaching this technique so that people become aware of their responsibility and make fewer mistakes during insulin administration.

Need for the Study

By 2025, the number of diabetes patients is expected to increase by 41% in developed countries to 72 million from the present level of 51 million In developing countries. Self care is a crucial element in secondary prevention of diabetes. Diabetics have a poor level of knowledge about the disease and self-care and hence a very casual attitude towards the disease. This predisposes them to the risk of development of complications in later life. Health education is an area which needs to be addressed immediately to improve patients' knowledge and skills of diabetes self-care practices so that they can better contribute towards the management of their disease.

The lifestyle disease known to be restricted to urban population in the country till a few years ago has now invaded rural India as well, with as much as 3% of the total rural population being diagnosed with diabetes. Urban diabetic patients are estimated to account for nearly 10% to 11% of the total 25 million patients in India. The disease presently affects 10% of the affluent class and nearly 33% of the lower levels of population. The prevalence of diabetes is 16.6% in Hyderabad, followed by Chennai with 13.5%, Bangalore with 12.4%, Delhi with 11.6%, and Mumbai with 9.3%.

The study was conducted on “awareness and knowledge of diabetes in Chennai” - the Chennai urban rural epidemiology study, shows Awareness and knowledge regarding diabetes is still grossly inadequate in India. Massive diabetes education programmers are urgently needed both Urban and rural India.

In patients with diabetes, physicians are often concerned about increasing functional limitations that may impede a successful self-management. In particular, the correct handling of the insulin injection requires complex self-management abilities. Among these functional limitations, loss of visual acuity, loss of manual abilities and cognitive decline are of most importance. Many studies have recommended the education programmes for the diabetic patients.

Researcher has come across many diabetic clients during clinical practice as well as at the place residence who found difficult to administer insulin by self. Considering this the researcher decided to undertake study to assess effectiveness of educational intervention on knowledge and practice in self administration of insulin and improve their knowledge and practice by providing teaching and demonstration.

Aim of the Study

"Assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus attending out-patient Diabetology department.

Objectives of the Study

1. To assess the level of knowledge and practice in self administration of insulin among client with diabetes mellitus.
2. To assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among client with diabetes mellitus.
3. To compare the pre-test and post-test level of knowledge and practice in self administration of insulin among clients with diabetes mellitus.
4. To correlate between the post test level of knowledge and practice in self administration of insulin among clients with diabetes mellitus.
5. To associate the post test level of knowledge and practice in self administration of insulin with selected demographic variables of client with diabetes mellitus.

Hypotheses:

H1: There will be significant gap in level of knowledge and practice in self administration of insulin among clients with diabetes mellitus.

H2: There will be significant difference in the pre-test and post-test level of knowledge and practice in self administration of Insulin among clients with diabetes mellitus.

H3: There will be significant correlation between the post-test level of knowledge and level of practice in self administration of insulin among clients with diabetes mellitus.

H4: There will be significant association between the post-test level of knowledge and practice in self administration of insulin with selected demographic variables.

Assumption of the study

Client with diabetes mellitus usually have inadequate knowledge and practice in self administration of insulin, and educational intervention will improve their level of knowledge and practice.

Review of literature

Related to diabetes mellitus, self administration of insulin and need for education, effectiveness of educational intervention in improving the knowledge and practice level in self administration of insulin among diabetic clients.

Methodology of the study

Quantitative research approach, Quasi-experimental design, sample size is 50, selected by simple random technique by lottery method from the sample frame within eligibility criteria.

Data was collected using semi-structured interview/observation schedule for demographic profile of diabetes mellitus clients, knowledge questionnaire on general information about diabetes mellitus and self administration of insulin, observation checklist for practice in self administration of insulin.

Pre test was carried out using the prepared tools, education intervention carried out by teaching using power point slides, flip chart. Administration of insulin technique was demonstrated. Pamphlet on insulin administration technique was issued. Post test was carried after one week.

The study was carried out in Diabetology out-patient department of Government Rajaji Hospital, Madurai-20, for period of one month duration from 16 November 2010 to 15 December 2010 with formal permission from Head of the Department and approval of Ethical Committee. Informed consent obtained from the participants and information about the study was given to them.

Pilot study was conducted to find out the feasibility of conducting the study and refinement of tools.

6.2 MAJOR FINDINGS OF THE STUDY

Level of Knowledge and level of practice in self administration of insulin was inadequate. The findings of pretest show that overall mean knowledge score was inadequate (36.2%). In knowledge on general information mean score was 37.4%, in self administration 35.8%. Among participants 78.0% of them had inadequate knowledge, 22.0% had moderately adequate knowledge and none of them had good knowledge. The mean practice score in self administration of insulin was inadequate (12.54). Among all participants 74.0% had inadequate practice, 26.0% had moderately adequate practice and none of them had good practice.

After educational intervention the knowledge and practice score diabetes mellitus client is improved. Overall post test mean knowledge score 35.32. in general information the score is 8.32 and in self administration of insulin the score is 27.00. Among all participants 76.0% have adequate knowledge, 24.0 % have moderately adequate knowledge and none of them have inadequate knowledge. Overall post test mean practice score is 26.18. Among all participants 80.0% have good practice, 20.0% have moderately adequate practice and none of them have inadequate practice.

The pre and post test knowledge score is compare. The mean knowledge score is 15.92 in pretest and 35.32 in post test. The difference is 19.40. The difference is great and is significant (t=24.91,p=0.001,DF=98, significant). The level of knowledge score is compared. The results shows statistical significance (X^2=77.04, p==0.001, DF=2, significant). This means the post test knowledge level is improved. The pre and post test practice score is compared. The mean pretest practice score is 12.54, post test score is 26.18. The difference is 13.64. This difference is great and shows the improvement in practice (t=55.51, p=0.001, DF=98, significant), significant).

Pre and Post test level of practice is compared. Great difference exist in the level of practice in the post test .practice is improved. ($X^{2=}$77.39, p=0.00a, DF=2, significant) in knowledge aspect the gain is 44.1% and in practice the gain is 42.6% than pretest.

Correlation between knowledge and practice score made. In pretest r=0.019, p=0.21, not significant, positive, poor correlation exists. That means when knowledge increases the practice poorly increases. In posttest the correlation is substantial, r=0.63 p=0.001. Positive correlation between knowledge and practice. That means when knowledge increases the practice also increases substantially.

The post test findings are significantly associated with age, education status, family history of diabetes and duration of illness. In present study elders (>45 years, Pearson Chi-square test shows =8.34, p=0.02, DF=2, significant), more educated (HSC/Diploma/Degree, Pearson Chi-square test shows=8.57 p=0.001, DF=2, significant), with family history of diabetes mellitus (Pearson Chi-square test=5.25, p=0.19, DF=2, significant) are having more knowledge than others.

Elders (>45 years, Pearson Chi-square test =6.93, p=0.03, DF= 2, significant), more educated (HSC/Diploma/Degree, Pearson Chi-square test shows=7.40, p=0.02, DF=2, significant), with more years of duration of illness (>5 years, Pearson Chi-square test=7.13, p=0.03, DF=2, significant) are having more practice than others.

6.3 CONCLUSION

Diabetes Mellitus affects the global health of the individual. Diabetes mellitus management includes both medical management and self care activities. Self care activities are more important in controlling disease and prevention of complications. It requires clients' active participation and self motivation. Since it is lifelong disease adherence to therapeutic regiment is difficult. Knowledge and understanding about the disease condition in detail is needed for developing desirable attitude and skill to follow self care activities. So structured education program tailored to individual need is required to empower the clients with these requirements. Education, demonstration, return demonstration and reinforcement through different media can help to improve the knowledge and practice of clients with diabetes mellitus.

6.4 IMPLICATIONS

The study has implications, guidelines, and suggestions for nursing practice, nursing education, nursing administration and nursing research.

Nursing Practice

- The study results will help the nursing personnel to understand the impact of Diabetes Mellitus and need for proper education to the clients.
- In clinical practices all nurses can assist the clients empowering them with knowledge and help them to assume a greater responsibility for their own care.
- Nurses can monitor the clients practice in self administration of insulin injection periodically and ensure correct practices.
- Nurses can help the clients with diabetes mellitus to develop healthy behavior by positive reinforcement.

Nursing Education

- Nurse educators should teach the students and include in the syllabus about diabetes mellitus, its management in detail and develop skill in administration of insulin.
- Components of health education and impart health education measures..
- Life style modifications needed to prevent or control disease progression and complications.
- Develop different tool to assess the knowledge status.
- Develop tools to assess the practice level.

Nursing Administration

- Nursing administrators can organize in-service programs for nurses to empower them with up to date knowledge on diabetes mellitus and its management.
- Administrators can arrange for skill training program for nurses in self administration of insulin.
- They can organize health education camps to educate the public to create awareness and develop desirable attitude.
- Encourage nurses to conduct research in these areas.
- Continuous daily health education classes can be organized at out-patient department with audio-visual aids like power point slides. Hand outs and pamphlets can be issued to reinforce learning.

Nursing Research

- The study will be valuable reference material for future researchers.
- The findings of this study would help to expand scientific body of professional knowledge upon further researchers can be conducted.
- Study can be conducted in a large scale level in consideration of other contributing variables.
- Prosperity of Diabetology Nursing as separate specialty.

6.5 RECOMMENDATIONS

- Similar study can be replicated on a large scale basis.
- The study can be conducted in different diabetes types and the results can be compared.
- A study can be done for longer duration.
- A study can be conducted to assess various factors associated with self care activities of diabetes mellitus clients.
- A study can be conducted to assess the effectiveness of various methods of teaching using different Audio-Visual Aids.
- A study cane is conducted to assess the effectiveness of one-to-one teaching and group teaching, so that effective can be implemented.
- A study can be conducted to determine the factors associated with non adherence to therapeutic regimen.

6.6 LIMITATIONS

The present study has following limitations:

- Difficulty faced in sustaining attention of the clients for one hour.

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K.Dis.No:4933/E4/1/10

Govt.Rajaji.Hospital,Madurai.20.
Dated 3.11.2010.

Sub: Establishment- Govt.Rajaji.Hospital,Madurai.20-
Minutes of the Ethical committee – meeting held on
19.8.2010-regarding.

Minutes of the Ethical committee meeting held at 12.00 Noon on 19.8.2010 at the Medical Superintendent's Chamber, Govt. Rajaji. Hospital, Madurai. The following members of the committee, where present and the topics were approved.

1.Dr.S.M.Sivakumar, MS.,	Medical superintendent Govt. Rajaji Hospital.Madurai	Convenor
2.Dr.N.Vijayasankaran, M.Ch.(Uro)	Sr.Consultant urologist, Madurai Kidney Center, Sivaganangai Road, Madurai.	Chairman
3. Dr. T.Meena, MD,	Prof . of Physiology, Madurai Medical College,	M ember
4. Dr. Moses K. Daniel, MD,	Prof. of Medicine, Madurai Medical College.	Member
5. Dr. M.Gopinath, MS (Gen surg),	Prof. of Surgery, Madurai Medical College.	Member
6.Dr. S.S. Dilsath, MD (O&G)	Prof. of Obs & Gyn. Madurai Medical College.	Member
7. Dr. B.K.C. Mohan Prasad, M.ch. (Surg. Oncology)	Prof. of Surg Oncology. Madurai Medical College.	Member -Secy
8. Shri. M.Sridher, B.Sc, B.L	Advocate, 623-B II Floor, East II Cross, K.K Nagar, Madurai-20	Member
9. Shri. O.B.D. Bharat, B.Sc.,	Businessman Plot. No.588, K.K. Nagar, Madurai-20	Member.
10. Shri. S. Sivakumar, M.A, (Social), M.Phil	Sociologist, Plot No:51, F.F. K.K. Nagar, Madurai-20	Member.

Mrs.A.Fareetha Banu	M.Sc(Nursing) II year CON, MMC, Madurai	A study to assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus attending Diabetology Out-patient Department, Government Rajaji Hospital,Madurai-20

Medical Superintendent

APPENDIX-B

LETTER SEEKING PERMISSION FOR PILOT STUDY

From

A.Fareetha Banu
M.Sc. (N) I year,
College of Nursing,
Madurai Medical College,
Madurai - 20.

To

PROFESSOR AND HEAD OF THE DEPARTMENT,
DEPARTMENT OF DIABETOLOGY,
GOVERNMENT RAJAJI HOSPITAL,
MADURAI.

Through: The proper channel

Respected sir,

Sub: Requesting permission to conduct pilot study on the topic "**A study to assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus attending Diabetology outpatient Department, Government Rajaji Hospital, Madurai 20".**

I am the First Year M.Sc. Nursing student of College of Nursing, Madurai Medical College, Madurai. In Partial fulfillment of Master Degree in Nursing, I have selected the above topic for the dissertation to submit to the Dr.M.G.R Medical University, Chennai. I request you to kindly give me permission to conduct pilot study in the selected wards of Government Rajaji Hospital, Madurai – 20. Kindly do the needful.

Thanking you,

Yours Sincerely,

A. Fareetha Banu

Place :Madurai
Date : 22-10-2010

Principal
Principal
COLLEGE OF NURSING
Madurai Medical College
Madurai-20.

Signature
Dr A. U. ASIRVATHAM

Dr. A. U. ASIRVATHAM, MD., D.DIAB.,
Prof and Head
Department of Diabetology
Madurai Medical College
Diabetologist GRH, MADURAI

APPENDIX C

LETTER SEEKING AND GRANTING PERMISSION FOR CONDUCTING THE STUDY

From

A.Fareetha Banu
M.Sc (Nsg) II year
College of Nursing,
Madurai Medical College
Madurai 20

To

Professor & Head of the Department
Department of Diabetology
Government Rajaji Hospital
Madurai 20

Through: The Proper channel

Respected Sir,

Sub: Requesting opinion and suggestion of experts for content validity of Tool for **"A study to assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus attending Diabetology outpatient Department, Government Rajaji Hospital, Madurai 20"**

I am **A.Fareetha banu** final year Master degree Nursing student in College of Nursing, Madurai Medical College, Madurai. In partial fulfillment of Master Degree in Nursing, I have selected the topic for the dissertation to submit to The Dr. MGR Medical University, Chennai. I request you to kindly validate the tool and give your expert opinion for necessary modifications and also I would be very grateful if you could refine the problem statement and the objectives.

Enclosures

Statement of the Problem

Objectives

Research tool

1. Demographic profile
2. Assess the knowledge on general information diabetes mellitus
3. Checklist for assessment on practice on self administration insulin

Thanking You.

Place: Madurai
Date:

Yours sincerely,
A. Fareetha Banu
(A.Fareetha Banu)

Principal
Principal
COLLEGE OF NURSING
Madurai Medical College

Signature
Dr. A. U. ASIRVATHAM, MD., D.DIAB.,
Prof. of Diabetology
Madurai Medical College

APPENDIX D

LETTER SEEKING PERMISSION FOR CONTENT VALIDITYOF TOOL

From

A.Fareetha Banu
M.Sc (N) II year
College of Nursing
Madurai Medical College,
Madurai-20

To

The Professor
Head of the Department,
Department of Diabetology,
Government Rajaji Hospital,
Madurai – 20.

Through – The proper channel

Respected Madam / Sir,

Sub : Requesting opinion and suggestion of experts for content validity of tool for **"A study to assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus attending Diabetology Out-patient Department, Government Rajaji Hospital, Madurai-20".**

I am **A.Fareetha Banu** final year Master degree Nursing Student in College of Nursing, Madurai Medical College, Madurai. In partial fulfillment of Master Degree in Nursing. I have selected the topic for the dissertation to submit to the Dr.MGR Medical University, Chennai. I request you to kindly validate the tool and give your expert opinion for necessary modifications and also I would be very grateful if you could refine the problem statement and the objectives.

Enclosure

Proposals
Research tool
Demographic profile
Assess the knowledge on general information of diabetes mellitus
Assess the knowledge of Self Administration of insulin
Assess the practice on observation check list

Thanking you,

yours faithfully,

A. Fareetha Banu

Place :Madurai
Date : 22-10-2010

Principal
Principal
COLLEGE OF NURSING
Madurai Medical College
Madurai-20.

Signature
Dr. A. U. ASIRVATHAM
Seal
Dr. A. U. ASIRVATHAM, MD., D.DIAB.,
Prof of Diabetology
Madurai Medical College
Diabetologist GRH, MADURAI

CONTENT VALIDITY CERTIFICATE

TO WHOMSOEVER IT MAY CONCERN

This is certify that the tool planned to use for data collection by **A.Fareetha Banu M.Sc (N) II year** on dissertation entitled "**A study to assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus attending Diabetology Out-patient Department, Government Rajaji Hospital, Madurai-20"** is relevant, valid and fulfill the study objectives.

Date: 28/10/10

Signature

Dr. Mrs. K. MENAKA, M.Sc.,(N). Ph.D.,
READER,
COLLEGE OF NURSING,
MADRAS MEDICAL COLLEGE,
CHENNAI - 03

Seal

CONTENT VALIDITY CERTIFICATE

TO WHOMSOEVER IT MAY CONCERN

This is certify that the tool planned to use for data collection by **A.Fareetha Banu M.Sc (N) II year** on dissertation entitled "**A study to assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus attending Diabetology Out-patient Department, Government Rajaji Hospital, Madurai-20"** is relevant, valid and fulfill the study objectives.

Date: 6/1/11

Signature

6/1/11

Seal

Dr. C.R. ANAND MOSES, M.D.
PROFESSOR OF DIABETOLOGY
Govt. Kilpauk Medical College & Hospital,
Chennai - 600 010.
Reg. No. 33116

CONTENT VALIDITY CERTIFICATE

TO WHOMSOEVER IT MAY CONCERN

This is certify that the tool planned to use for data collection by **A.Fareetha Banu M.Sc (N) II year** on dissertation entitled "**A study to assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus attending Diabetology Out-patient Department, Government Rajaji Hospital, Madurai-20"** is relevant, valid and fulfill the study objectives.

Date: 26.10.10

Signature

Prof. P.V. RAMACHANDRAN
Chairman Nursing Education
Sri Ramachandra College of Nursing
Sri Ramachandra University
Porur, Chennai - 600 116

Seal

CONTENT VALIDITY CERTIFICATE

TO WHOMSOEVER IT MAY CONCERN

This is certify that the tool planned to use for data collection by **A.Fareetha Banu M.Sc (N) II year** on dissertation entitled "**A study to assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus attending Diabetology Out-patient Department, Government Rajaji Hospital, Madurai-20"** is relevant, valid and fulfill the study objectives.

Date: 10/11/10

10/11/10.

Signature

Prof. S. CHANDRAKALA, M.Sc (N)
VICE PRINCIPAL, HOD OF MED. SURG.
SACRED HEART NURSING COLLEGE
ULTRA TRUST, MADURAI-20

Seal

CONTENT VALIDITY CERTIFICATE

TO WHOMSOEVER IT MAY CONCERN

This is certify that the tool planned to use for data collection by **A.Fareetha Banu M.Sc (N) II year** on dissertation entitled "**A study to assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus attending Diabetology Out-patient Department, Government Rajaji Hospital, Madurai-20"** is relevant, valid and fulfill the study objectives.

Date: 1.11.10

Signature

Dr A.J ASIRVATHAM

Seal

Dr. A. J. ASIRVATHAM, MD., D.DIAB.,
Prof of Diabetology
Madurai Medical College
Diabetologist GRH, MADURAI

CONTENT VALIDITY CERTIFICATE

TO WHOMSOEVER IT MAY CONCERN

This is certify that the tool planned to use for data collection by **A.Fareetha Banu M.Sc (N) II year** on dissertation entitled "**A study to assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus attending Diabetology Out-patient Department, Government Rajaji Hospital, Madurai-20"** is relevant, valid and fulfill the study objectives.

Date:

Signature

Prof. & Head of the Department,
MEDICAL SURGICAL NURSING

Seal

CONTENT VALIDITY CERTIFICATE

TO WHOMSOEVER IT MAY CONCERN

This is certify that the tool planned to use for data collection by **A.Fareetha Banu M.Sc (N) II year** on dissertation entitled "**A study to assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus attending Diabetology Out-patient Department, Government Rajaji Hospital, Madurai-20"** is relevant, valid and fulfill the study objectives.

Date: 26.10.10

Signature

Prof. P.V. RAMACHANDRAN
Chairman Nursing Education
Sri Ramachandra College of Nursing
Sri Ramachandra University
Porur, Chennai - 600 116

Seal

CONTENT VALIDITY CERTIFICATE

TO WHOMSOEVER IT MAY CONCERN

This is certify that the tool planned to use for data collection by **A.Fareetha Banu M.Sc (N) II year** on dissertation entitled "**A study to assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus attending Diabetology Out-patient Department, Government Rajaji Hospital, Madurai-20"** is relevant, valid and fulfill the study objectives.

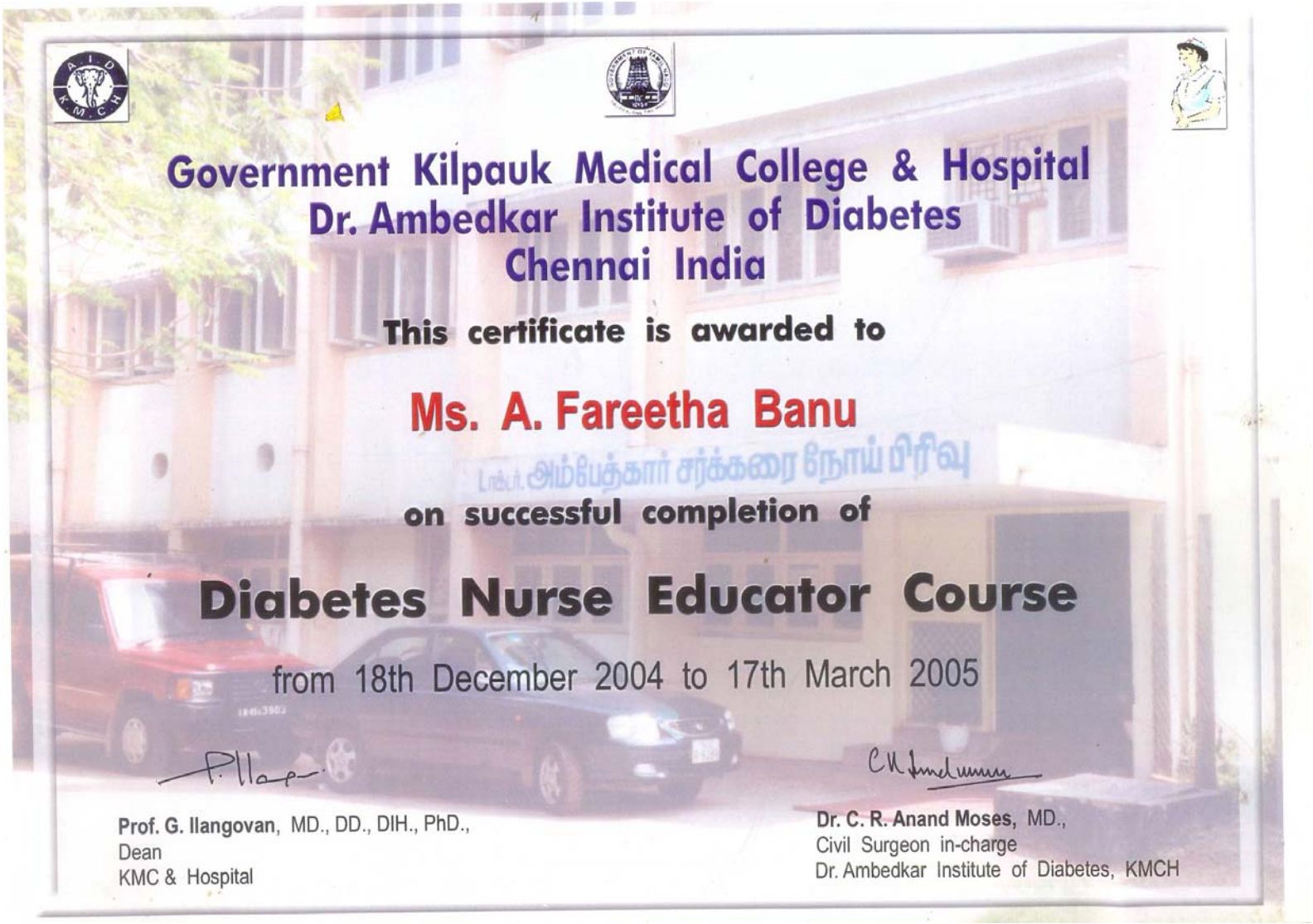
Date: 8-10-2010

Signature 8/10/10

Prof.P.Andal,M.Sc.(N)
Asst.Professor of Medical Surgical Nursing
Sacred Heart Nursing College,
Ultra Trust, Madurai 20.

Seal

APPENDIX E



Government Kilpauk Medical College & Hospital
Dr. Ambedkar Institute of Diabetes
Chennai India

This certificate is awarded to

Ms. A. Fareetha Banu

டாக்டர் அம்பேத்கார் சர்க்கரை நோய் பிரிவு

on successful completion of

Diabetes Nurse Educator Course

from 18th December 2004 to 17th March 2005

Prof. G. Ilangovan, MD., DD., DIH., PhD.,
Dean
KMC & Hospital

Dr. C. R. Anand Moses, MD.,
Civil Surgeon in-charge
Dr. Ambedkar Institute of Diabetes, KMCH

APPENDIX F(a)

INFORMED CONSENT

Good morning,

I am **A.FAREETHA BANU** II Year M.Sc Nursing Student from College of Nursing, Madurai Medical College, Madurai. As a partial fulfillment of the programme, I am conducting "**A study to assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus attending Diabetology Outpatient Department, Government Rajaji Hospital, Madurai-20".** Kindly cooperate with me, by giving your frank and free answers to my questions. Your answers will be kept confidential and will be used only for my study.

Thank you.

APPENDIX F(b)

Muha;r;rp jfty; jhs;

ePhpopT Neha; ghjpf;fg;gl;lth;fSf;F Rakhf ,d;Rypd; Crpia jhq;fshfNt Nghl;Lf;nfhs;tjw;fhd Muha;r;rp jfty; ,J.

kJiu muR ,uh[h[p nghJ kUj;Jtkidapy;> ePhpopT ntsp Nehahsp gphptpw;F tUk; Nehahspfsplk; Ra ,d;Rypd; Nghl;Lf; nfhs;Sk; Kiw gw;wpa mwpTj;jpwd; mwpe;J rhpahd Kiwapy; gapw;rp jUtNj ,e;j Muha;r;rpapd; Nehf;fk;.

,d;Rypid rhh;e;j ePhpopT Nehahy; ghjpf;fg;gl;lth;fs;> ,d;Rypd; Crpapd; rhpahd Nkyhz;ik> kw;wth;fspd; cjtpapy;yhky;> Rakhf ,d;Rypd; nrYj;jpf; nfhs;Sk; gapw;rp> ,d;Rypd; gw;wpa gpd;tpisTfs; Nghd;wtw;iw mwptjd; %yk; jq;fspd; mwpTj;jpwd; kw;Wk; nray;jpwid Nkk;gLj;JjNy ,e;j Muha;r;rpapd; ,yl;rpakhFk;.

ePq;fSk; ,e;j Muha;r;rpapy; gq;Nfw;f ehq;fs; tpUk;GfpNwhk;. mjdhy; jq;fsJ rpfpr;irf;F ve;jtpj ghjpg;Gk; Vw;glhJ vd;gijAk; njhptpj;J nfhs;fpNwhk;.

KbTfis my;yJ fUj;Jf;fis ntspapLk; NghNjh my;yJ Muha;r;rpapd; NghNjh jq;fsJ ngaiuNah my;yJ milahsq;fisNah ntspapl khl;Nlhk; vd;gijAk; njhptpj;Jf; nfhs;fpNwhk;.

,e;j Muha;r;rpapy; gq;Nfw;gJ jq;fSila tpUg;gj;jpd; Nghpy;jhd; ,Uf;fpwJ. NkYk; ePq;fs; ve;NeuKk; ,e;j Muha;r;rpapypUe;J gpd; thq;fyhk; vd;gijAk; njhptpj;Jf; nfhs;fpNwhk;.

,e;j rpwg;G Muha;r;rpapd; KbTfis Muha;r;rpapd; NghJ my;yJ Muha;r;rpapd; Kbtpd; NghJ jq;fSf;F mwptpg;Nghk; vd;gijAk; njhptpj;J nfhs;fpNwhk;.

Muha;r;rpahsh; ifnahg;gk; **gq;Nfw;ghsh; ifnahg;gk;**

Njjp:

Muha;r;rp jfty; gbtk;

ePhpopT Nehahy; ghjpf;fg;gl;lth;fSf;F Rakhf ,d;Rypd; ifahs;tjw;fhd gapw;rp mspg;gjhy; mwpT kw;Wk; nray;jpwid Vw;Fk; khw;W fy;tpg;gapw;rp.

ngah;: Njjp:

taJ: Nehahsp vz;:

ghy;: Muha;r;rp Nrh;f;if vz;:

,e;j Muha;r;rpapd; tptuq;fSk; mjd; Nehf;fq;fSk; KOikahfTk;> njspthfTk; vdf;F tpsf;fg;gl;lJ.

vdf;F tpsf;fg;gl;l tp\aq;fis ehd; Ghpe;J nfhz;L ehd; vdJ rk;kjj;ij njhptpf;fpd;Nwd;.

vdf;F Rakhf ,d;Rypd; vLf;Fk; Kiwia gw;wpa mwpTj;jpwd; kw;Wk; nray;jpwd; gw;wpa gapw;rp Kiwia ngw;Wf; nfhs;s rk;kjk;.

,e;j Muha;r;rpapy; gpwhpd; eph;ge;jkpd;wp vd; nrhe;j tpUg;gj;jpd; Nghpy; jhd; gq;F ngWfpNwd; kw;Wk; ehd; ,e;j Muha;r;rpapypUe;J ve;NeuKk; gpd;thq;fyhk; vd;gijAk; mjdhy; ve;j ghjpg;G Vw;glhJ vd;gijAk; ehd; Ghpe;J nfhz;Nld;.

ehd; Rakhf ,d;Rypd; vLf;Fk; rhpahd Kiwia gw;wpa tptuq;fis ngw;Wf; nfhz;Nld;. ehd; vd;Dila RaepidTlDk; kw;Wk; KO Rje;jpuj;JlDk; ,e;j kUj;Jt Muha;r;rpapy; vd;id Nrh;j;J nfhs;s rk;kjpf;fpNwd;.

Nkw;fz;l rpfpr;irapd; NghJ ve;jtpj ghjpg;Gk; Vw;glhJ vd;gijAk; kUj;Jth; %yk; njhpe;J nfhz;Nld;. vd;Dila ngah; kw;Wk; milahsk; ufrpakhf itj;Jf;nfhs;sg;gLk; vd;W vdf;F cWjpaspf;fg;gl;Ls;sJ.

ifnahg;gk;

APPENDIX G

CERTIFICATE OF ENGLISH EDITING

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the dissertation work "***A study to assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus attending Diabetology Outpatient Department, Government Rajaji Hospital, Madurai-20"*** done by **Mrs.A.FAREETHA BANU,** II Year M.Sc (Nursing), in College of Nursing, Madurai Medical College, Madurai – 20 is edited for English language appropriateness by

V. GURUNATHAN

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CHENNAI - 600 001.

APPENDIX H

CERTIFICATE OF TAMIL EDITING

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the dissertation work "***A study to assess the effectiveness of educational intervention on knowledge and practice in self administration of insulin among clients with diabetes mellitus attending Diabetology Outpatient Department, Government Rajaji Hospital, Madurai-20"*** done by **Mrs.A.FAREETHA BANU,** II Year M.Sc (Nursing), in College of Nursing, Madurai Medical College, Madurai – 20 is edited for Tamil language appropriateness by

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APPENDIX I

SCORING KEY

***Section B*:**

Each correct answer was given a score of "1" mark and wrong answers "0" score. Knowledge score obtained is converted into percentage and accordingly the level of knowledge.

SCORE INTERPRETATION: Total score 44

SCORE	LEVEL OF KNOWLEDGE	MARKS
0-50%	In adequate	0- 22
51-75%	Moderately adequate	23-33
76-100%	Adequate	34-44

SECTION C:

Observation check list is scored as 1 mark for correct practice and 0 mark for incorrect practice.

PRACTICE SCORE INTERPRETATION: Total score 32

Score	Level of Practice	Marks
0 -50%	In adequate practice	0-16
51-75%	Moderately adequate practice	17-24
76-100%	Good practice	25-32

APPENDIX - J

SECTION –A

DEMOGRAPHIC VARIABLE

Sample No._____

Select the correct answer and show in box provided.

1. **Age in years** ☐
   a) 30 - 35
   b) 36 - 45
   c) 46 - 50
2. **Gender** ☐
   a) Male
   b) Female
3. **Religion** ☐
   a) Hindu
   b) Muslim
   c) Christian
4. **Educational Status** ☐
   a) No formal education
   b) Primary
   c) Middle
   d) Higher Secondary
   e) Diploma
   f) Degree
5. **Occupation** ☐
   a) Business
   b) Clerical
   c) Skilled worker
   d) Unskilled worker
   e) Agriculture
   f) House wife/unemployed

6. **Income in Rupees** ☐

a) < 2000
b) 2001 - 4000
c) > 4000

7. **Marital Status** ☐

a) Single
b) Married
c) Widow / Widower
d) Divorced

8. **Place of residence** ☐

a) Urban
b) Rural

9**. Food Habits** ☐

a) Vegetarian
b) Non-vegetarian

10. **Family history of diabetes mellitus** ☐

a) Father
b) Mother
c) Siblings
d) Grand Parents
e) None

11. **Previous exposure of seeing the administration of insulin injection is through-** ☐

a) Media
b) Hospitals
c) Family members
d) None

12 .**Duration of having diabetes mellitus:** ☐

a) 0 - 3Years
b) 3 - 5Years
c) 5 years above

SECTION B

KNOWLEDGE ON GENERAL INFORMATION ON SELF ADMINISTRATION OF INSULIN

Select correct answer and show in box provided

Knowledge on diabetes mellitus

1) The meaning of Diabetes mellitus is- ☐

a. Increase in blood glucose level in the blood.

b. Increase in urea level in blood

c. Increase in blood cholesterol level

d. Increase in sodium level

2) The normal fasting blood sugar level is: ☐

a. 80 - 100 mg/dl

b. 110 - 125 mg /dl

c. 100 - 140 mg/dl

d. Do not know

3) The normal post-prandial blood glucose level is ☐

a. 120 – 180 mg / dl

b. 140 - 199 mg /dl

c . ≥200 mg/ dl

d Do not know

4) Diabetes mellitus is caused by, ☐

a. Less or no secretion of insulin from pancreas

b. Over secretion of insulin

c. Peptic ulcer

d. Do not know

5) The symptom of diabetes mellitus are, ☐

a. Increased thirst, increased hunger and increased urine output

b. Nausea and vomiting

c. Stomach pain

d. Back pain

6) The treatment available for diabetes mellitus is: ☐

a. exercise / medication
b. High caloric diet / Insulin / Brisk walking
c. Balanced Diet / exercise / medication
d. High protein diet / insulin / exercise

7. The food substance are to be allowed in diabetes mellitus are, ☐

a. Fibre food substances (whole brane, whole grain)
b. Balanced diet with adequate fiber
c. Carbohydrate diet
d. No dietary restriction

8. A Diabetic patient should carry always ☐

a. Identity card
b. Fast acting sugar
c. Prescription/Medication
d. All the above

9. the common complication of diabetes mellitus except, ☐

a. Foot ulcer
b. Hypoglycemia
c. Jaundice
d. Blurred vision

10. Long term complication of Diabetes mellitus is, ☐

a. Retinopathy and Neuropathy / Nephropathy
b. Brain tumour
c. Liver failure
d. Blood cancer

KNOWLEDGE ON SELF ADMINISTRATION OF INSULIN

11. Meaning of Insulin is a / an, ☐

a. Hormone
b. Enzyme
c. Electrolytes
d. Do not know

12. .The action of Insulin ☐

a. Reduces the serum cholesterol
b. Control the blood glucose level
c. Reduce the bilirubin level
d. Reduce the Urea level

13. The Types of Insulin ☐

a. Rapid acting, regular
b. Intermediate acting
c. Long acting
d. All the above

14. Identifying the plain Insulin ☐

a. Clear
b. Cloudy
c. Clear and Cloudy
d. All the above

15. Identifying the Lente Insulin ☐

a. Clear
b. Cloudy
c. Clear and Cloudy
d. All the above

16. Insulin should be stored in: ☐

a. In refrigerator, side of the lower compartment/ kept in polythene Plastic bag and immersed in cool water box container.
b. In direct sun light
c. Anywhere at home
d. In a air tight container

17. The temperature at which insulin should be administered ☐

a. Taking out from refrigerator, immediately

b. Till it attains the room temperature

c. Taking out 2 hours after from refrigerator

d. No specific temperature required

18. While travelling how you will preserve the insulin medication ☐

a. Under the box/ bag

b. Air tight container

c. Keeping the insulin medication Water containing bowl

d. No special precaution

19. .Open insulin vial is stable at room temperature for about, ☐

a. 2 Weeks

b. 2 Months

c. 4 Weeks

d. 4 Days

20. Before administering the Insulin vials should be checked ☐

a. Expiry date / any discoloration / any crystals

b. Only Discoloration

c. Only crystals

d. No need to check

21. When to eat food when taking rapid acting insulin ☐

a. After 5 to 15 minutes

b. After 20 to 30 minutes

c. After 30 minutes

d. After one hour

22. When to eat food when taking intermediate acting insulin ☐

a. After 5 to 15 minutes

b. After 20 to 30 minutes

c. After 30 minutes

d. After one hour

23. When to eat food when taking long acting insulin

a. After 5 to 15 minutes
b. After 20 to 30 minutes
c. After 30 minutes
d. After one hour

24. Hand washing is needed before Insulin administration:

a. To prevent infection
b. To cleaning purpose
c. To spread of infection
d. none of the above

25. Before administering the Insulin injection the vial is-,

a**.** rolled between the hands gently
b. shacked vigorously
c. injected directly
d. none of the above.

26. The importance of rolling the Insulin Vial between hands helps for-

a. Easy withdrawal of insulin from Vial
b. Proper mixing of Insulin
c. Reduce the side effects
d. Reduce the infection

27. The type of syringe should be used to administer Insulin

a. 2 ml syringe
b. Insulin Syringe (1 ml)
c. Syringe as per Insulin marking. (U-40, U-100)
d. Any type of Syringe

28. The size of the needle used to give insulin injection

a. 30-31Gauge needle
b. 20 Gauge needle
c.23 Gauge needle
d. 22 Gauge needle

29. The first one to withdraw, when you have received a mixed Insulin (Short acting (plain) and intermediate acting cloudy) Insulin) ☐

a. Intermediate (cloudy)
b. Short acting (plain)
c. Anyone
d. Do not know

30. Insulin should be administered, ☐

a. Intra muscular
b. Intradermal
c. **I**ntravenous
d. Subcutaneous

31. The fastest insulin absorption site ☐

a. Arm
b. Thigh
c. Buttocks
d. Abdomen (2 inch away from around the umbilicus)

32. Reason for rotating Insulin injection site ☐

a. To prevent absorption
b. For quick absorption
c. For poor absorption
d. To facilitate better absorption

33. The angle which you keep while administering the Insulin injection ☐

a. 10 - 30° angle
b. 45 - 90° angle
c. No specific angle
d. None

34. Pinch up is done using- ☐

a. Whole hand
b. Thumb, Index and Middle finger
c. Two fingers.
d. Not necessary.

35. The next step after injecting the insulin injection

a. Massage that area vigorously
b. Remove the needle immediately
c. Do not press the area
d. Count up to 5 and release the pinch up

36. The preventive measure on Atrophy on injection site

a. Systematic rotation of injection site
b. Frequently using same site
c. Apply firm pressure over the injection site.
d. Rubbing the area

37. Prevention of destruction in subcutaneous tissues at the time of insulin therapy

a. To Massage the area after Insulin injection
b. To Give hot application on that area
c. To Give cold application on that area
d. To rotate the injection site

38. The reason for not using the needle

a. Electro etched coating is lost
b. Injection site will be more painful
c. Tip of needle can be broken and left in the site.
d. All of the above

39. After administrating insulin injection the needle is

a. Recapped
b. Bent and thrown
c. **C**lipped and disposed
d. Keep in refrigerator

40. If you suspect very low blood sugar, the next step

a. To lie down and sleep immediately
b. To take one dose of Insulin injection
c. To take one cup of glucose water
d. To take one cup of plain Hot water

41. When you are falling sick on a particular day- ☐

a. Omit the Insulin injection on that day
b. Take an extra dose of Insulin Injection on that day
c. Administer the normal dose of Insulin and monitor the blood glucose
d. Do not know

42. The complication of insulin administration ☐

a. Lipohypertropy and Lipoatropy
b. Allergy reactions
c. Hypoglycemia
d. All the above

43. Signs and symptoms of Hypoglycemia ☐

a. Heartburn and chest pain
b. More swelling and tremor
c. **F**requent cough and wheezing
d. Cold sweats, faintness, dizziness

44. Managing Hypoglycemia during long time travel ☐

a. 15gms of Fast acting sugar / candies 3-5
b. Take heavy meals immediately
c. Not to take insulin injection
d. Drink water only

SECTION C

OBSERVATION CHECK LIST FOR SELF ADMINISTRATION OF INSULIN

SL	BEHAVIOURS	CORRECT	INCORRECT
	I. Preliminary Procedures		
1	Collect necessary articles(Insulin syringe, needle, cotton balls, or alcohol swab, spirit, insulin injections and paper bag)		
2.	Check Physician order for date, time & number of units and type of Insulin		
3.	Look at the label and appearance of the insulin bottle		
4.	Write date of Opening on the bottle / pen		
5.	Keep food ready to eat after the insulin injection of 15 – 30 minutes.		
6.	Wash hands thoroughly		
7.	Roll the Insulin bottle between the hands gently		
	II. Drawing Insulin(Single)		
8.	Wipe the top of insulin bottle with alcohol swab		
9.	Hold syringe like a pen and hold vial on a flat surface		
10.	Pull plunger down to let in air equal amount of your Insulin dose.		
11.	Gently push the needle into the vial and avoid touching the metal rim on the bottle with the needle tip.		
12.	Holding the bottle upside down slowly and steadily draw the dose into the sy*ringe, without air bubbles.*		
13	If bubbles are present, push plunger all the way into the vial and slowly pull the plunger back to the line for your dose of insulin.		
14.	Repeat until there are no large air bubbles in the syringe.		
15.	Slowly pull down the plunger with index finger and middle finger.		
	III. Drawing Mixing Insulin		
16	Wipe the top of both the insulin bottles with alcohol swab		
17.	Draw air into the syringe equal to the dose of cloudy insulin desired.		
18.	Insert the needle through the rubber stopper of the cloudy insulin vial and inject the air into it.		

SL	BEHAVIOURS	CORRECT	INCORRECT
19.	Remove the needle without drawing up the cloudy insulin.		
20.	Pull the plunger back to the dose of regular insulin desired, inject the air into the clear insulin vial.		
21.	Leave the needle into the bottle, turn the vial upside down and slowly draw the desired dose of regular insulin. Check for air bubbles.		
22.	Hold the bottle upside down, insert the needle through the rubber stopper of the cloudy insulin vial, and pull the plunger back to the marking that indicates the total dose of insulin.		
23.	Slowly pull down the plunger with index finger and middle finger		
IV.	**Procedure for injecting Insulin**		
24	Sit comfortably and select the correct site for injection		
25.	Clean the site start in the middle of the area and then moving in a circular motion.		
26.	Gently pinch up the area of the skin between your thumb, index and middle fingers.		
27.	Insert the needle through the skin at 90°. Slowly push plunger into inject the insulin.		
28.	Do not massage the area and count till Five before pulling the needle out		
29.	Release the pinch-up and press on alcohol swab over the injected spot.		
30.	Remove the syringe. Clip off the syringe needle and Dispose swabs.		
	AFTER CARE		
31.	Replace all the articles. Insulin in a cool place or in a refrigerator.(side of the lower shelves)		
32.	Wash hands and record Insulin dose in your diary.		

APPENDIX K

©¬Ü - A

jdpegh; tpguk;:

Uô§¬ Gi.....

gpd;tUt;w;iw ftdkhf gbj;Jrhpahd tpilia Njh;e;njLj;J fl;lj;jpy; Fwpg;gplTk;.

1. YVÕ (YÚPeL°p) ☐
   A. 30 - 35
   B. 36 - 45
   C. 46 - 50
2. Tô-]m ☐
   A. Bi
   B. ùTi
3. URm ☐
   A. CkÕ
   B. CvXôªVo¤Øv-m
   C. ¡ÚjÕYo
4. Lp®jRÏ§ ☐
   A. T¥dLôRYo
   B. ùRôPdLdLp® UhÓm
   C. CûP¨ûX Lp® UhÓm
   D. úUp¨ûXlT¥l× Ø¥jRYo
   E. ThPVlT¥l×
   C. gl;lg;gbg;G
5. ùRô¯p ☐
   A. tpahghuk;
   B. mYtyf Ntiy
   C. njhopy;El;g ty;Yeh;fs;
   D. njhopyhsh;fs;
   E. ®YNôVm
   C. CpXjRW£ / Ntiy ,y;yhjth;
6. UôR YÚUô]m (ìTô«p) ☐
   A. <2000
   B. 2001 - 4000
   C. >4000
7. §ÚUQm NôokR ¨ûX ☐
   A. LpVôQUôLôRYo
   B. LpVôQUô]Yo
   C. ®RûY¤®RûYVo

D. ®YôLWjRô]Yo

8. Ï¥«ÚdÏm CPm

A. SLWm

B. ¡WôUm

9. EQÜ TZdLeLs

A. ûNYm

B. AûNYm

10. ¿¬¯Ü úSôn Ï±jR TWmTûW YWXôß

A. AlTô

B. AmUô

C. NúLôRWo¤NúLôR¬

D. RôjRô¤Tôh¥

E. CÕYûW G]Õ TWmTûW«p GYÚdÏm ¿¬¯Ü úSôn CpûX

11. CuÑ-u F£ úTôhÓd ùLôsÞm Øû\ûVl Tt±V ØuAàTYm¤A±Ü

Es[Rô?

A. FPLm

B. kUj;Jtkidfs;

C. FLk;gegh;fs; %yk;

D. GÕÜm CpûX.

12. RôeLs ¿¬¯Ü úSôVôp AY§lTÓm YÚPeLs

A. 0-3 YÚPeLs

B. 3-5 YÚPeLs

C. 5 YÚPeLÞdÏúUp

©¬Ü - B

Rakhf ,d;Rypd; Nghl;Lf; nfhs;Sk; Kiwia gw;wpa mwpTj;jpwd;

rhpahd tpilia Njh;e;njLj;J fl;lj;jpy; Fwpg;gplTk;.

ePhpopT gw;wpa mwpTj;jpwd;

1. ¿¬¯Ü úSôn GuTÕ ☐

   A. CWjRj§p NodLûW A[Ü A§L¬lTÕ

   B. CWjRj§p ë¬Vô A[Ü A§L¬lTÕ

   C CWjRj§p ùLôÝl× (ùLôXvhWôp) A[Ü A§L¬lTÕ

   D. El©u A[Ü A§L¬lTÕ

2. ùTôÕYôL EQÜdÏ Øu]o CWjRj§p CÚdL úYi¥V NodLûW«u A[Ü ☐

   A. 80 - 100 ª.¡.¤ nlrp.yp

   B. 110 - 125ª.¡.¤ nlrp.yp

   C. 100 - 140 ª.¡.¤nlrp.yp

   D. ùR¬V®pûX

3. ùTôÕYôL EQÜdÏl ©u]o CWjRj§p CÚdL úYi¥V NodLûW«u A[Ü ☐

   A. 120 - 180 ª.¡.¤nlrp.yp

   B. 140 - 199ª.¡.¤nlrp.yp

   C. ≥200 ª.¡.¤nlrp.yp

   D. ùR¬V®pûX

4. ¿¬¯Ü úSôn HtTÓYRu LôWQm ☐

   A. LûQVj§p CuÑ-u Ïû\YôL ApXÕ GÕÜúU ÑWdLôUp CÚjRp

   B. A§LUô] CuÑ-u ÑWjRp

   C. ÏPp×i

   D. ùR¬V®pûX

5. ¿¬¯Ü úSô«u A±Ï±Ls ☐

   A. A§LUô] RôLm, A§LUô] T£ / mjpf rpWePh; fopj;jy;

   B. Yôk§¤ÏUhPp

   C. Y«tßY-

   D. KJFtyp

6. ¿¬¯Ü úSôVô°LÞdÏl T¬kÕûWdLlTÓm UÚjÕYm ☐

   A. EPtT«t£ ¤ UÚjÕLs

   B. A§L khTr;rj;Jf;fs; mlq;fpaczT¤ EQÜ¤EPtT«t£¤ÑßÑßlTô] SûPT«t£

   C. NUfºo EQÜ¤EPtT«t£¤UÚkÕLs

   D. A§L×WRfNjÕ¤CuÑ-u¤EPtT«t£

7. ¿¬¯Ü úSôn Es[YoLs LûP©¥dL úYi¥V EQÜ Øû\ ☐

   A. SôoNjÕ Es[EQÜLs (ØÝ Rô²VeLs)
   B. NUfºo EQÜLs úRûYVô] A[Ü / SôoNjÕ EQÜLs
   C. khTr;rj;Jfs; epiwe;j czT
   D. EQÜdLhÓlTôÓ úRûY CpûX.

8. ¿¬¯Ü úSôVô°Ls GlùTôÝÕm Øuù]fN¬dûLVôL GÓjÕf ùNpX úYi¥VûY ☐

   A. úSôVô[o AûPVô[AhûP
   B. ®ûW®p ùNVpTÓm NodLûW ApXÕ 3-5 ªhPônLs
   C. UÚkÕ T¬ÜûW ºhÓ¤UÚkÕLs
   D. úUtLiP Aû]jÕm

9. ùTôÕYôL ¿¬¯Ü úSôÙPu úNokÕ YÚm ùRôkRWÜLs - CûRjR®W ☐

   A. TôRj§p ×i
   B. RôrNodLûW ¨ûX
   C. UgNs LôUôûX
   D. LiTôoûY UeÏRp

10. ¿¬¯Ü úSôVôp HtTÓm SôsThP £dLpLs ☐

    A. LiúLô[ôß ¤ SWm× Tô§l×¤£ß¿WL Tô§l×
    B. êû[dLh¥
    C. LpÄWp ùLhÓlúTôRp
    D. CWjR ×tßúSôn

Rakhf ,d;Rypd; Crp Nghl;Lf;nfhs;Sk; Kiw gw;wpa mwpTj;jpwd;

11. CuÑ-u GuTÕ ☐

    A. aôoúUôu
    B. GuûNm (Fd¡)
    C. GXdhúWôûXhÓLs
    D. ùR¬V®pûX

12. CuÑ-u ùNVpTôÓ GuTÕ ☐

    A. ùLôÝlûT (ùLôXvhWôp) Ïû\d¡u\Õ
    B. CWRj§p ÏÞdúLôû^ LhÓlTÓjÕ¡u\Õ
    C. ©ÛÚ©u A[ûY Ïû\d¡u\Õ[
    D. ë¬Vô®u A[ûY Ïû\d¡u\Õ

13. CuÑ-u-u YûLL[ôY] ☐

    A. ®ûW®p ùNVpTÓYÕ, ùRôPokÕ ùNVpTÓYÕ
    B. CûPlThP ùNVpTôÓ
    C. ¿iP úSW ùNVpTôÓ

D. úUtLiP Aû]jÕm

14. NôRôWQ CuÑ-û] GqYôß LiÓ©¥lÀoLs? ☐

A. ùR°Yô]Õ
B. UkRôWUô]Õ
C. ùR°Yô]Õ Utßm UkRôWUô]Õ
D. úUtLiP Aû]jÕm

15. ùXu¥ CuÑ-û] GqYôß LiÓ©¥lÀo? ☐

A. ùR°Yô]J
B. UkRôWUô]Õ
C. ùR°Yô]Õ Utßm UkRôWUô]Õ
D. úUtLiP Aû]jÕm

16. CuÑ-û] GqYôß úNªjÕ ûYlÀoLs ☐

A. Ï°oTR]lùTh¥«u ¸rTÏ§ ¤ Ïl©Lû[©[ôv¥d ûT«p ûYjÕ Ï°of£Vô] ¿¬p ngl;bapy; úTôhÓ ûYlTÕ.
B. úSW¥ ã¬V ùY°fNj§p ûYlTÕ
C. Åh¥p GkRl TÏ§«Ûm ûYdLXôm.
D. Lôtß×LôR ùTh¥«p ûYlTÕ.

17. CuÑ-u EP-p ùNÛjR úYi¥V ùYlT¨ûX. ☐

A. Ï°lTR]l ùTh¥«p CÚkÕ ùY°úV GÓjRÜPu
B. Aû\ ùYlT¨ûXûV AûPkRÜPu
C. Ï°olTR]l ùTh¥«p CÚkÕ ùY°úV GÓjR 2 U¦ úSWj§p
D. Ï±l©hP ùYlT¨ûX GÕÜm úRûY«pûX

18. TVQj§u úTôÕ CuÑ-u Ïl©ûV GqYôß TôÕLôjÕ ûYlÀoLs ☐

A. ùTh¥«p¤ûT«p Õ¦LÞdÏ A¥«p ûYlTÕ
B. Lôtßl×LôRYôß TôÕLôlTôL ûYlTÕ
C. CuÑ-u Ïl©ûV Ri½o úLôlûTdÏs ûYlTÕ
D. GkR £\l× TôÕLôl× Øû\Ùm úRûY«pûX.

19. §\dLlThP CuÑ-u Ïl© Aû\ ùYlT¨ûX«p ¨ûXVôL CÚlTÕ ☐

A. 2 YôWeLs
B. 4 UôReLs
C. 4 YôWeLs
D. 4 SôhLs

20. CuÑ-û]d Ïl©«p CÚkÕ GÓlTRtÏ Øu× úNô§dL úYi¥VûY? ☐

A. ARu BÙhLôXm ¤ ¨\m Uô±«Úd¡\Rô ÕLsLs HRôYÕ CÚd¡\Rô Guß BWônRp
B. kUe;jpd; ¨\m Uô±«Úd¡\Rô Guß kl;Lk; BWônRp

C. UÚk§p Lh¥Ls Utßm ÕLsLs HtTh¥Úd¡u\Rô Guß kl;Lk; BWônRp

D. úNô§dL úRûY«pûX.

21. ®ûW®p ùNVpTÓm CuÑ-u úTôÓmúTôÕ GlùTôÝÕ EQÜ ☐

EhùLôs[úYiÓm?

A. 5-15 ¨ªPeLÞdÏ ©\Ï

B. 20 - 30 ¨ªPeLÞdÏ ©\Ï

C. 30 ¨ªPeLÞdÏ ©\Ï

D. JÚ U¦ úSWj§tÏ ©\Ï

22. CûPlThP úSWm ùNVpTÓm CuÑ-u, úTôÓmúTôÕ GlùTôÝÕ ☐

EQÜ EhùLôs[úYiÓm ?

A. 5-15 ¨ªPeLÞdÏ ©\Ï

B. 20 - 30 ¨ªPeLÞdÏ ©\Ï

C. 30 ¨ªPeLÞdÏ ©\Ï

D. JÚ U¦ úSWj§tÏ ©\Ï

23. ¿iPúSWm ùNVpTÓm CuÑ-u úTôÓmúTôÕ GlùTôÝÕ ☐

EQÜ EhùLôs[úYiÓm?

A. 5-15 ¨ªPeLÞdÏ ©\Ï

B. 20 - 30 ¨ªPeLÞdÏ ©\Ï

C. 30 ¨ªPeLÞdÏ ©\Ï

D. JÚ U¦ úSWj§tÏ ©\Ï

24. CuÑ-u F£ úTôhÓdùLôsÞm Øu ûLLÝÜYRu LôWQm ☐

A. ùRôtû\ RÓlTRtÏ

B. Rj;jg;gLj;Jtjw;F

C. ùRôtû\ TWl×YRtÏ

D. úUtLiP GÕÜm CpûX.

25. CuÑ-u úTôÓmúTôÕ UÚkÕ Ïl©ûV ☐

A. ùUuûUVôL ûLLÞdÏ¡ûP«p ûYjÕ EÚhP úYiÓm.

B. TXUôL LXdL úYiÓm.

C. úSW¥VôL F£ úTôPlTÓ¡u\Õ

D. úUtLiP GÕÜm CpûX.

26. CuÑ-u Ïl©Lû[ûLL°p ûYjÕ EÚhÓYRu TVuTôÓLs ☐

A. Ïl©«p CÚkÕ UÚkÕ G°RôL ùY°úV YW ERÜ¡\Õ

B. Ïl©«p CÚdÏm UÚkÕ N¬VôLd LXk§P ERÜ¡\Õ.

C. TdL®û[ÜLû[d Ïû\d¡\Õ.

D. ùRôtû\ Ïû\lTRtÏ

27. CuÑ-u ùNÛjR TVuTÓjRlTÓm F£dÏZô«u A[Ü ☐

A. 2 ª- F£dÏZôn
B. CuÑ-u F£dÏZôn
C. CuÑ-u A[Ü Ï±dLlThP F£dÏZôn (ë-40,ë-100)
D. HRôYùRôÚ F£dÏZôn

28. CuÑ-u úTôP TVuTÓjRlTÓm F£«u A[Ü ☐
A. 30 - 31 A[Ü F£
B. 20 A[Ü F£
C. 23 A[Ü F£
D. 22 A[Ü F£

29. Ïû\kR úSWm ùNVpTÓm CûPlThP úSWm ùNVpTÓm CuÑ-u CWiûPÙm LXkÕ úTôÓmùTôÝÕ ØR-p F£dÏZô«p GÓdL úYi¥V CuÑ-u ☐
A. CûPlThP úSWm ùNVpTÓm CuÑ-u (UkRôWUô]Õ)
B. Ïû\kRúSWm ùNVpTÓm CuÑ-u (ùR°Yô]Õ)
C. HRôYÕ Juß
D. ùR¬V®pûX.

30. CuÑ-u ¨oY¡dLlTP úYi¥V Øû\ ☐
A. RûNdÏs
B. úRôÛdÏs
C. £ûWdÏs
D. úRôÛdL¥«p

31. CuÑ-u úYLUôL E±gNlTÓm CPm ☐
A. ûL
B. ùRôûP
C. ×hPm
D. tapw;Wg;gFjp (2 mq;Fyk; njhg;Gis Rw;wp)

32. CuÑ-u F£ úTôÓm CPjûR JqùYôÚ Øû\Ùm ☐
UôtßYRtÏd LôWQm
A. UÚkÕ E±gÑRûX RÓdL
B. ®ûW®p E±gÑYRtÏ
C. Ïû\YôL E±gÑYRtÏ
D. Su\ôL E±gÑRûX G°RôdÏYRtÏ

33. CuÑ-u F£ EP-p ùNÛjÕûL«p F£ GkR úLôQj§p ☐
Nônk§ÚdL úYiÓm.
A. 10-30^0 úLôQm
B. 45-90^0 úLôQm
C. Ï±l©hP úLôQ A[Ü GÕÜm CpûX.

D. ùR¬V®pûX.

34. CuÑ-u F£ ùNÛjÕm CPjûR EVoj§ ©¥dL TVuTÓYÕ ☐

A. ûLLs
B. LhûP®Wp, SÓ®Wp Utßm BsLôh¥ ®Wp
C. CÚ ®WpLs
D. EVoj§ ©¥dL úRûY«pûX.

35. CuÑ-u F£ úTôhP©\Ï ùNnV úYi¥VÕ. ☐

A. ùNÛjRlThP CPjûR Su\ôL úRndL úYiÓm.
B. F£ûV EP]¥VôL ùY°úV GÓdLúYiÓm.
C. F£ úTôhP CPjûR mOj;j $lhJ
D. 5 GiÔm YûW EVoj§ ©¥jÕ ©\Ï F£ûV GÓdL úYiÓm.

36. F£ úTôhP CPj§p YÛ®Zl× HtTÓYûRj RÓdL ☐

A. Øû\VôL F£úTôÓm CPjûR UôtßYRu êXUôL
B. AúR CPj§p A¥dL¥ F£ úTôÓYRu êXUôL
C. F£ úTôhP CPjûR ¨ûXVô] AÝjRm ùLôÓlTRu êXUôL.
D. F£ úTôhP CPjûR úRnjÕ ®ÓRp êXUôL.

37. CuÑ-u £¡fûN úSWj§p úLôX¥ §ÑdL°u A¯ûY RÓdL ☐

A. CuÑ-u F£ ùNÛj§V©u AkR TÏ§«p UNôw ùNnV úYiÓm
B. AkR TÏ§«p ãÓ A°lTÕ.
C. AkR TÏ§«p Ï°o A°lTÕ.
D. F£ úTôÓm CPjûR UôtßYRu êXm

38. TVuTÓj§V F£ûV ÁiÓm TVuTÓjRdáPôÕ Hù]²p ☐

A. ªuéfÑ A¯kÕ ®Óm
B. F£ úTôhP CPm A§Lm Y-dÏm
C. F£ Ö² EûPjÕ, AkR CPj§p EsRe¡®Óm.
D. úUtLiP Aû]jÕm.

39. CuÑ-u F£ûV úTôhP©\Ï F£ûV ☐

A. ÁiÓm ê¥ TôÕLôlTôL ûYjÕ ®P úYiÓm.
B. Yû[jÕ ®hÓ, G±kÕ ®P úYiÓm.
C. EûPjÕ®hÓ fise;J ®PúYiÓm.
D. Ï°oNôR]l ùTh¥«p ûYdL úYiÓm.

40. CWjRj§p NodLûW A[Ü Ïû\kÕ®hPÕ úTôp ¿eLs ☐

NkúR¡d¡uÈoLs Gu\ôp EP]¥VôL ùNnV úYi¥VÕ

A. EPú] TÓjÕ çeL úYiÓm.
B. CuÑ-u F£ JÚ úPôv GÓjÕ ùLôs[úYiÓm.
C. ÏÞdúLôv Ri½o JÚ úLôlûT GÓjÕdùLôs[úYiÓm.

D. ùYÕùYÕlTô] ÑÓRi½o JÚ úLôlûT GÓjÕd ùLôs[úYiÓm.

41. EPpSXm Ïußm SôhL°p ☐

A. AkR Sô°p CuÑ-u F£ûV R®odLÜm.

B. AkR SôhL°p JÚ úPôv CuÑ-u áÓRXôL GÓdLÜm.

C. NôRôWQ CuÑ-u A[ûY GÓjÕd ùLôiÓ CWjRj§pÏÞdúLôv A[ûY LiLô¦dLÜm.

D. ùR¬V®pûX.

42. CuÑ-u F£ £¡fûNVôp HtTÓm £dLp¤£dLpLs ☐

A. ùLôÝl× RûN ÅdLm¤ ùLôÝl× RûN YÛ®Zl×

B. JqYôûU ®û[ÜLs

C. CWjRj§p ªL Ïû\kR ÏÞdúLôv

D. úUtLiP Aû]jÕm.

43. CWjR NodLûW Ïû\YRu A±Ï±Ls ☐

A. ùSgÑ G¬fNp Utßm Uôo× Y-

B. A§L ÅdLm Utßm SÓdLm

C. A¥dL¥ CÚUp Utßm êfÑj§Q\p

D. Ï°o ®VojRp, UVdLm, RûXÑt\p

44. ¿iPúSWm TVQm ùNnÙmúTôÕ CWjR NodLûW A[Ü ☐
(Ïû\kÕ®hPôp) úUtùLôs[lTÓm £¡fûN Øû\

A. 15 fpuhk; ®ûW®p ùNVpTÓm NodLûW¤3 my;yJ 5 ªhPônLs

B. EP]¥VôL A§L EQÜ EhùLôsÞRp.

C. CuÑ-u F£ GÓjÕd ùLôs[dáPôÕ.

D. Ri½o UhÓm Ï¥jRp.

gphpT - ,

,d;Rypd; Rakhf eph;tfpg;gij rhpghh;f;Fk; gl;bay;

Y. Gi.	SPjûRLs	N¬ ¤ RYß
I.	**Muk;g eilKiwfs;**	
1.	úRûYVô] ùTôÚhLû[úNL¬dLÜm (CuÑ-u F£dÏZôn, F£, TgÑÚiûPLs, BpLaôp, TgÑ, CuÑ-u UÚkÕ, Lô¡R ûT)	
2.	UÚjÕY¬u A±ÜûW«p úR§, úSWm, UÚk§u A[Ü Utßm CuÑ-u YûLûV N¬TôodLÜm	
3.	CuÑ-u Ïl©«p úX©s úRôt\m TôodLÜm	
4.	CuÑ-u Ïl©ûV §\kR úR§ûV Ï±l©PÜm	
5.	CuÑ-u F£dÏl©\Ï 15-30 ¨ªPeLÞdÏs EiQ EQÜ RVôWôL ûYdLÜm	
6.	Øt±Ûm ûLûV LÝYÜm	
7.	CuÑ-u Ïl©ûV CÚ ûLLÞdÏ¡ûP«X ûYjÕ ùUuûUVôL EÚhPÜm	
II.	**,d;Rypid Crpf;Foha;f;Fs; epug;Gtjw;F xNu tif ,d;Rypd; (jdpahf)**	
8.	CuÑ-u Tôh¥-u úUp WlTo TÏ§ûV BpLaôp TgÑ ûYjÕ ÕûPdLÜm.	
9.	F£dÏZôûV úT]ôûYl úTôp ©¥dLÜm. Ïl©ûV RhûPVô] TWl©p ûYdLÜm	
10.	CuÑ-u A[ÜdÏ NUUôL Lôtû\ F£dÏZôndÏs CÝdLÜm	
11.	ùUÕYôL F£ Ïl©dÏs Tôh¥-u EúXôL ®°m©p Øû] ùRôPôRYôß ùNÛjRÜm	
12.	CuÑ-u Tôh¥ûX RûX¸ZôL ©¥jÕd ùLôiÓ ùUÕYôL ºWôL úRûYVô] A[Ü CuÑ-û] F£dÏZôndÏs Lôtßd Ï[a]r CpXôUp CÝdLÜm	
13.	LôtßdÏ[a]rLs CÚkRôp, F£dÏZô«u CÝûYûV Tôh¥ÛdÏs Rs°®hÓ, ©\Ï ùUÕYôL CÝjÕ N¬Vô] A[Ü UÚkûR CÝdLÜm	
14.	ùT¬V Lôtßd Ï[a]rLs CpXôRYôß UßØû\ ùNnVÜm	
15.	ùUÕYôL ÑhÓ®Wp Utßm SÓ®WXôp CÝûYûV ¸úZ CÝdLÜm	

III. fyit ,d;Rypid Crpf;Fohapy; epug;Gtjw;F		
16.	CÚ CuÑ-u Tôh¥pLs úUpTÏ§ûV BpLaôp TgÑ ùLôiÓ ÕûPdLÜm	
17.	UkRôWUô] CuÑ-u A[ÜdÏ NUUô] A[Ü Lôtû\ F£dÏZôndÏs CÝdLÜm	
18.	UkRôWUô] CuÑ-u Ïl©«u WlTo ê¥ Y¯VôL F£ûV ÖûZjÕ Lôtû\ EhùNÛjRÜm	
19.	UkRôWUô] CuÑ-û] Es°ÝdLôUp F£ûV ¿dLÜm	
20.	F£dÏZô«u CÝûYûV ÁiÓm YZdLUô] CuÑ-u A[ÜdÏ ©u CÝjÕ, Lôtû\ ùR°kR CuÑ-u Tôh¥ÛdÏs ùNÛjRÜm	
21.	Tôh¥ÛdÏs F£ûV ®hÓ ©\Ï Ïl©ûV RûX¸Zôd¡, ùUÕYôL úRûYVô] A[Ü YZdLUô] CuÑ-û] GÓdLÜm. LôtßdÏªr CÚd¡u\Rô Guß úNô§dLÜm.	
22.	Tôh¥ûX RûX¸ZôLl ©¥jÕ WlTo úUpê¥ Y¯VôL F£ûV ùNÛj§ (UkRôWUô] CuÑ-û] Tôh¥-u) ùUôjR CuÑ-u A[ûY Ï±l©hÓ, F£dÏZô«u CÝûYûV ©uàdÏ CÝdLÜm	
23.	F£dÏZô«u CÝûYûV ÑhÓ®XôÛm, SÓ®WXôÛm ùUÕYôL ¸úZ CÝdLÜm	
IV. ,d;Rypd; Crp NghLk; Kiw		
24.	YN§VôL EhLôokÕ, F£ úTôÓYRtÏ N¬Vô] CPjûRj úRokùRÓdLÜm	
25.	F£ úTôÓm CPjûR, Uj§«p ùRôPe¡ ©u YhPUôL ÑjRm ùNnVÜm	
26.	LhûP®Wp, ÑhÓ®Wp, SÓ®WÛdÏ CûP«p úRôûX ùUÕYôL ©¥jÕ EVojRÜm	
27.	F£ûV úRôÛdÏs 90^0 úLôQj§p ÖûZdLÜm. ©u ùUÕYôL F£d ÏZô«u CÝûYûV Rs° CuÑ-u ùNÛjRÜm	
28.	F£ûV ùY°úV CÝlTRtÏ Øu 5 YûW GiQÜm. F£ úTôhP TÏ§ûV úRndLdáPôÕ.	
29.	úRôûX EVoj§l ©¥jRRûR R[oj§®hÓ BpLaôp TgÑ ùLôiÓ F£úTôhP CPjûR AÝj§l ©¥dLÜm	
30.	F£dÏZôûV ALt\Üm. F£ûV LZt± UPd¡ ALt± TgûN Al×\lTÓjRÜm	
V rpfpr;irf;Fg;gpd; ftdpj;jpy; nfhs;s Ntz;bait		
31.	GpXô ùTôÚhLû[Ùm GÓjR CPj§p ûYdLÜm. CuÑ-u Ïl©ûV Ï°okR CPj§p ApXÕ Ï°oNôR]l ùTh¥«p §Úl© ûYdLÜm	

32.	ûLLû[ÑjRUôLd LÝYÜm. CuÑ-u úTôhP ®TWjûR SôhÏ±lúTh¥p Ï±dLÜm. Ï±jR úSWj§tÏs EQ®û] EiQÜm	

APPENDIX - L

ANSWERS

1.	a	23.	c
2.	b	24.	a
3.	b	25.	a
4.	a	26.	b
5.	a	27.	c
6.	c	28.	a
7.	b	29.	b
8.	d	30.	d
9.	c	31.	d
10.	a	32.	d
11.	a	33.	b
12.	b	34.	b
13.	d	35.	d
14.	a	36.	a
15.	b	37.	d
16.	a	38.	d
17.	b	39.	c
18.	c	40.	c
19.	c	41.	c
20.	a	42.	d
21.	a	43.	d
22.	b	44.	a

tpilfs;

1. m	23. ,
2.M	24.m
3.M	25.m
4.m	26.M
5.m	27.,
6.,	28.m
7.M	29.M
8.<	30.<
9.,	31.<
10.m	32.<
11.m	33.M
12.M	34.M
13.<	35.<
14.m	36.m
15.M	37.<
16.m	38.<
17.M	39.,
18.,	40.,
19.,	41.,
20.m	42.<
21.m	43.<
22.M	44.m

Lesson Plan On

Self Administration of Insulin

APPENDIX M

LESSON PLAN

Topic	:	Self Administration of Insulin
Group	:	Clients with diabetes mellitus selected for self administration of insulin who are receiving
Setting	:	Diabetology Out-patient Department, Government Rajaji Hospital, Madurai-20.
Venue	:	Diabetology Out- Patient Department – Teaching Annexure
Method of Teaching	:	Demonstration
A.V. Aids	:	Flipchart, Power point presentation and pamphlets.

INTRODUCTION

Diabetes mellitus is a global disease affects the quality of life. Management of diabetes mellitus includes diet, exercise, drugs and modification of life styles. Drugs include oral hypoglycemic agents as well as insulin. Insulin can be administered in various routes and methods. Subcutaneous injection is very commonly used mode of administration. Correct technique should be adopted during injection. Otherwise complications will occur and the benefit of therapy will go down. Clients should be empowered with knowledge and technique of insulin administration. Structured education should be arranged by nurses to provide education to the clients. Periodical monitoring is necessary to ensure correct technique by the clients. Here in this lesson we are going to discuss the different aspects of self administration of insulin.

CENTRAL OBJECTIVE:

Enable the learner to acquire knowledge and understanding on self administration of insulin and develop desirable attitude and skills and also help them to apply this knowledge and skills in practice.

CONTRIBUTORY OBJECTIVE:

1. verbalize the term ‘Diabetes Mellitus
2. causes of diabetes mellitus
3. classification of diabetes mellitus
4. state the goals of treatment
5. list the clinical manifestation of diabetes mellitus
6. narrate the diagnostic criteria of diabetes mellitus
7. available management of diabetes mellitus
8. complications of diabetes mellitus
9. understand the term ‘self administration of insulin’
10. mention the types of insulin injection
11. appreciate the storage aspects of insulin
12. sites of insulin injection
13. describe the systematic rotation of insulin injection site
14. complication of insulin administration of insulin injection
15. demonstrate the technique of self administration of insulin technique

S. NO	CONTRIBUTORY OBJECTIVE	CONTENTS	TEACHERS ACTIVITY	LEARNERS ACTIVITY	A.V. AIDS
1.	Verbalize the term 'Diabetes Mellitus"	**Diabetes Mellitus** Diabetes mellitus is a condition in which there is impaired mellitus metabolism of carbohydrates, proteins, fats, with an increased blood sugar level due to an imbalance between insulin supply and insulin demand. Insulin is produced in the pancreas.	Explaining	Observing and listening	Flip chart
2.	Causes of Diabetes mellitus	**Risk Factors for Diabetes Mellitus** • Family history of diabetes i.e. parents or siblings with diabetes. • Obesity [$\geq$ 20% over desired body weight or Bml $\geq$ 27 kg/m^2] • Race / ethnicity • Age $\geq$45 years • Previously identified impaired fasting glucose or impaired glucose tolerance. • Hypertension ($\geq$140 / 90 mmHg) • HDL cholesterol level $\geq$ 35 mg/dl • History of gestational diabetes	Explaining and discussion	Observing and listening	Flip chart

S. NO	CONTRIBUTORY OBJECTIVE	CONTENTS	TEACHERS ACTIVITY	LEARNERS ACTIVITY	A.V. AIDS

3.	State the goals of treatment	**The goals of treatment are:**
		• To improve the peoples quality of life
		• To provide participants with an understanding
		• To condition from perceptive of the person with diabetes
		  • Personal test
		  • Economic cost
		  • Effective self management skills from the day of diagnosis
		  • Ways to facilitate the transition from childhood to adolescents and into adult care
		The overall goal of care for the patient with diabetes mellitus is to control or to regulate the blood sugar.
			Explaining and discussion	Listening	

4.	Classification of diabetes mellitus	**Classification of Diabetes mellitus and related glucose intolerance** • Type 1 • Type 2 • Diabetes mellitus associated with other conditions of syndromes • Gestational diabetes • Impaired glucose tolerance • Pre-diabetes FBG – 100 – 125 mg/dl 2 hr after glucose level – 140 – 199 mg/dl	Explaining	Observing and listening	Flip chart

S. NO	CONTRIBUTORY OBJECTIVE	CONTENTS	TEACHERS ACTIVITY	LEARNERS ACTIVITY	A.V. AIDS
5.	Clinical manifestation of diabetes mellitus	**Clinical Manifestation:** Main 3 points are: Polyuria (increased urination) Polydipsia (increased thirst) Polyphagia (increased appetite) Other symptoms: • Fatigue • Weakness • Sudden vision changes • Tingling or numbness in hands or feet • Dry skin • Skin lesions • Wounds that are slow to heal • Recurrent infections • Type 1 diabetes (sudden weight loss or nausea, vomiting or abdominal pains) • Urethritis	Explaining	Observing and listening	Flip chart

<table>
<tr><th>S. NO</th><th>CONTRIBUTORY OBJECTIVE</th><th>CONTENTS</th><th>TEACHERS ACTIVITY</th><th>LEARNERS ACTIVITY</th><th>A.V. AIDS</th></tr>
<tr>
<td>6.</td>
<td>Narrate the diagnostic criteria of diabetes mellitus</td>
<td>
<table>
<tr><th>Diagnostic criteria:</th><th>Normal</th><th>Impaired</th><th>Diabetes</th></tr>
<tr><td>Fasting Blood Sugar</td><td>< 100 mg/dl</td><td>100 – 125 mg/dl</td><td>≥126 (70 mmol /l)</td></tr>
<tr><td>2 hr Post 75g Glucose (load mg/dl)</td><td>< 140 mg/dl</td><td>140 – 199 mg/dl</td><td>≥ 200 (11.1 mol/l)</td></tr>
</table>
</td>
<td>Explaining</td>
<td>Observing</td>
<td>Discussion</td>
</tr>
<tr>
<td>7.</td>
<td>Available management of diabetes mellitus</td>
<td>
The important methods of diabetes mellitus:
A. Diet : The diet consists of : CHO – 50 – 60%
Protein – 20 – 30 %
Fat – 10 – 25 % of total calories determined by body weight and activity.
Diet planning aspects

BMI - Body Mass Index wt in kg/ height in meters^2
Activity
Age and sex
Present food habits
Economic status
Complication in diabetes
Treatment for diabetes

</td>
<td>Explaining</td>
<td>Observing and listening</td>
<td>Flip chart</td>
</tr>
</table>

<table>
<tr><th>S. NO</th><th>CONTRIBUTORY OBJECTIVE</th><th>CONTENTS</th><th>TEACHERS ACTIVITY</th><th>LEARNERS ACTIVITY</th><th>A.V. AIDS</th></tr>
<tr><td></td><td>Continued..</td><td>
Activity
<table>
<tr><th>Category</th><th>Sedentary</th><th>Moderate</th><th>Heavy</th></tr>
<tr><td>Obesity</td><td>25 kcal</td><td>30 kcal</td><td>35 kcal</td></tr>
<tr><td>IBW</td><td>30 kcal</td><td>35 kcal</td><td>40 kcal</td></tr>
<tr><td>Underweight</td><td>35 kcal</td><td>40 kcal</td><td>45 kcal</td></tr>
</table>
Foods to be included : Chapatti, bitter guard, green leafy vegetables, brinjal, drumsticks

Foods to be avoided : Sweet pastries, chocolates, ice-cream, jam butter, ghee, fruits, mango, bananas and alcohol
Vegetables, roots and tubers.
6 small feeds / day to avoid the hypoglycemia
Cereals and pulses – 6 – 11 servings
Vegetables – 3 – 5 servings
Fruits - 2 – 4 servings
Milk yogurt - 2 – 3 servings

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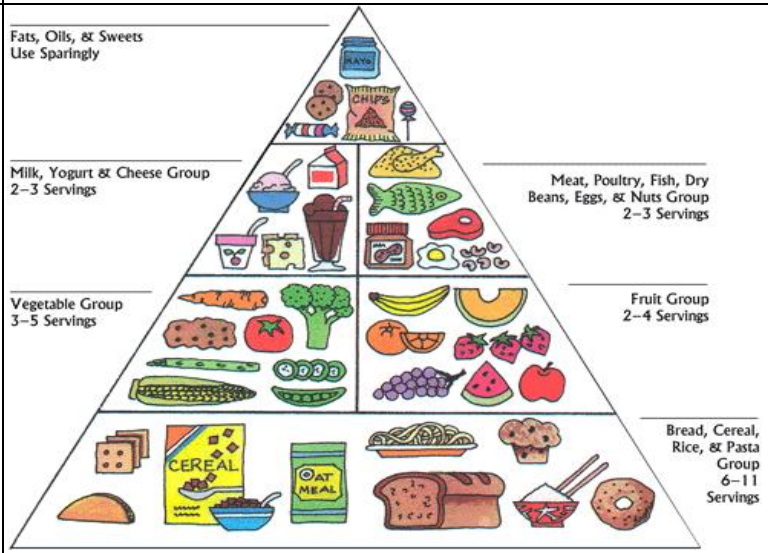
</table>

S. NO	CONTRIBUTORY OBJECTIVE	CONTENTS	TEACHERS ACTIVITY	LEARNERS ACTIVITY	A.V. AIDS
		 Meat, poultry - 2 – 3 servings Fist oil & sweet - use sparingly **Control of Food:** ❖ Based on individuals diabetic management goal is vary ❖ Providing all the essential good constituents ❖ To enable them to achieve optimum metabolic control ❖ Provide appropriate energy and nutrients for healthy growth and activity.			

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		❖ Attain and maintain normal blood glucose level ❖ Prevent hypoglycemia and hyperglycemia **B. Exercises** : Planned exercise (1) Aerobic (2) anaerobic **(1) <u>AEROBIC:</u>** Brisk walking – 1 hour 10 mtrs Slow walk 35 mtrs/ hr Fast walk } 200 calories 10 mts cool down **Cycling** - light walk (25mts) – 150 calories **Treadmill** } **Moderate activity** **Stair climbing** } 240 calories **Swimming** (2) **<u>ANEROBIC</u>** Muscle stretching exercise Gymnastics Weight Lifting **Not recommended for exercise to diabetic clients** High BP Retinopathy Heart problem Renal failure			

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		> 65years **Benefits for exercises:** a. Reduces weight b. Improves blood sugar control c. Reduces dose of medicines d. Improves quality of life e. Improves blood circulation f. Strengthen heart g. Lowers blood pressure h. Increases HDL [Good Cholesterol] i. Decreases LDL [Bad Cholesterol] **Special important : To consult with the Doctor** • If age is below 35 years • Have not exercised in a long time • If having insensitive feet having associated complications **C. Medication:** • Oral hypoglycemic agent • Insulin • Oral hypoglycemic agent			

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		• Insulin secretagogus ♦ Sulfonylurea ♦ Glibenclimide ♦ Glipizide ▪ Insulin sensitizer ♦ Metformin ♦ Acarbose Insulin therapy is the available of injection form.			
8.	**complications of diabetes mellitus**	Acute complications of Diabetes mellitus are: ❖ Hypoglecemia [BS 63 mg/dl] ❖ Hyperglycemia [BS >200 mg/dl] - 2 hour Plasma Glucose Level ❖ Type 1 DM - DKA [Diabetic Keto Acidiosis] HHNS [Hyperosmolar Hyper Glycemic Nonketotic Syndrome] Micro Vascular complications ❖ Retinopathy ❖ Neuropathy ❖ Nephropathy	Explaining	Observing and listening	Flip chart

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		Macro Vascular complications ❖ Coronary – Coronary artery disease ❖ Cerebral – Cerebral vascular accident ❖ Peripheral Neuropathy – Diabetic foot **Hyperglycemia** Blood glucose falls to less than 50 – 60 mg/dl and can be caused by too much insulin or too little poor or excessive physical activity. **Symptoms** ❖ Cold sweats, faintness, dizziness ❖ Headache ❖ Blurred vision ❖ Hunger ❖ Inability to awaken ❖ Personality changes ❖ Fatigue **Precautions:** **Learn about hypoglycemia** ➢ Adhere to the timings and quantity of food and medicine ➢ Carry simple carbohydrate containing snacks always ➢ In case of long sports activities take break, drink lot of water/ snacks			

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		➢ Keep injection glucose for ready ➢ Educate family members and problems ➢ Carry a medical ID card **Remember:** ➢ Check blood glucose level ➢ Do not panic and over react ➢ Review with the doctor or the educator **Hyperglycemia** Elevated blood glucose level, fasting level < 125 mg/dl. 2 hrs post prandial level < 200 mg/ dl **Diabetic ketoacidosis** It is caused by an absence or decrease amount of insulin. The main three functions of hyperglycemia are: 1. Hyperglycemia 2. Dehydration 3. Acidosis			

<table>
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<tr><td>9</td><td>Understand the term ‘self administration of insulin’.</td><td>Self administration of insulin – meaning of Insulin
Insulin injection taken by patients themselves without assistance. Insulin is hormone secreted by the beta cells of the islets of langerhans of the Pancreas.</td><td>Explaining</td><td>Observing and listening</td><td>Power point slides</td></tr>
<tr><td>10
.

.</td><td>State the types of insulin</td><td>Types of Insulin
<table>
<tr><th>Types</th><th>Agent</th><th colspan="4">Preparation</th></tr>
<tr><td></td><td></td><td>Onset</td><td>Peak</td><td>Duration</td><td>Appearance</td></tr>
<tr><td>Rapid acting</td><td>Lispro (humolog)
Aspart (Novolog)</td><td>10 –15 mts
5 – 15 mts</td><td>1hr
40 -50 mts</td><td>2 –4 hrs
2 –4 hrs</td><td>Clear
Clear</td></tr>
<tr><td>Short acting</td><td>Repules (humolog)</td><td>½ -1hr</td><td>2-3 hrs</td><td>4 -6 hrs</td><td>Clear</td></tr>
<tr><td>Inter Mediate</td><td>NPH [Neutral Protamine Hagedorn]</td><td>2-4 hrs</td><td>4-6 hr</td><td>16 – 20 Hrs</td><td>Cloudy</td></tr>
<tr><td>Very Long Acting</td><td>Gigargene Detemer</td><td>1 hr</td><td>No peak</td><td>24hrs</td><td>Cloudy</td></tr>
</table></td><td>Explaining</td><td>Observing and listening</td><td>Power point slides</td></tr>
</table>

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11.	Appreciate the storage aspects of insulin	Insulin should not be kept extremes of temperature it should not be frozen or kept at temperature out of 80°F. It should be stored in cool place away from sunlight preferably in the refrigerator. Before injection should be kept in room temperature insulin both should be checked for flocculation which is whitish coating inside the bottle that indicates there is deterioration of insulin potency. **NOTE:** Open insulin vial will be kept for one month only. New insulin vial will be kept for months together.	Explaining	Observing and listening	Power point slides
12.	Sites of insulin injection	Locates the systematic rotation of sites for injection – Four main areas Abdomen (fast absorption) • Thighs (slow absorption) • Arms (medium absorption) • Buttocks (Slow absorption)	Explaining	Observing and listening	Power point slides
13.	Describe the systematic rotation of insulin	Insulin absorption varies from site to site. As different sites have different patterns of absorption. Matching the sites to have time of injection is desirable. Insulin should not be injected over sites above muscles that will be exercises heavy as it increases the rate of absorption may result in hypoglycemia.	Explaining	Observing And listening	Power point slides

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	continuation	❖ **Abdomen** ▪ Abundant subcutaneous tissue and this less risk of an intramuscular injection. ▪ Easy to do a pinch up in the thigh or arm ▪ Fastest absorption ▪ 2 inches away from the umbilicus ❖ **Arm** ▪ Should be performed in the upper external quadrant ▪ Very thin layers of subcutaneous tissue ▪ Pinch up should be necessary for each injection ▪ Shorter needles should be used ❖ **Thigh** ▪ Should be performed anteriorly and laterally ❖ **Buttocks** ▪ Injection can safely be given without a pinch-up ▪ Absorption of insulin is relatively slow and predictable from the buttocks ideal for overnight infection. Systematic rotation of injection sites to promote consistency in insulin absorption. The patient should encourage using to all available injection sites within area rather than randomly rotating sites from area to area.	Explaining	Observing And listening	Power point slides

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		Tips for Injection Technique ➢ Inject insulin in the same area for 1 – 2 weeks ➢ Each time put the needle using different spot. ➢ At the end of 1 – 2 weeks move to another area of the body ➢ Inject into different spot every day.		Observing And listening	Power point slides
14.	Complication of insulin administration of insulin injection	**Complication of insulin injection** If we are not following the rotation of sites of injection- • Local allergic reaction-redness, swelling, tenderness and indurations • Systemic allergic reaction – urticaria • Insulin Lipodystropy-Lumpy nodules • Lipoatrophy • Lipohypertrophy	Explaining	Observing and Listening	Power point slides
15.	Demonstrate the Procedure of self administration of insulin	**Preliminary Procedures:** • Collect necessary articles of Insulin syringe, needle, cotton balls, alcohol swab, spirit, insulin injections and paper bag. • Check physician order for date, time and number of units and type of insulin	Demonstration	Observing and listening	Power point slides and Pamphlets

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	continuation	• Look at the label and appearance of insulin bottle check any flocculation • Write date of opening on the bottle with pen • Keep food ready to eat after insulin injection of 15-30 minutes • Wash hands thoroughly • Roll the insulin bottle between the hands gently **Drawing Insulin (Single)** • Wipe the top of Insulin bottle with alcohol swab • Hold syringe like a pen and hold vial on a flat surface • Pull plunger the needle into the vial and avoid touching the metal rim on the bottle with the needle tip • Holding the bottle upside down slowly and steadily draw the dose into the syringe, without air bubbles. • If bubbles are present, push plunger all the way into the vial and slowly pull the plunger back to the line for your dose of insulin. • Repeat until there are no large air bubbles in the syringe • Slowly pull down the plunger with index finger and middle finger.	Demonstration		

S. NO	CONTRIBUTORY OBJECTIVE	CONTENTS	TEACHERS ACTIVITY	LEARNERS ACTIVITY	A.V. AIDS
	continuation	**Drawing Mixing Insulin** • Wipe the top of both the insulin bottles with alcohol swab • Draw air into the syringe equal to the dose of cloudy insulin desired • Insert the needle through the rubber stopper of the cloudy insulin vial and inject the air into it. • Remove the needle without drawing up the cloudy insulin • Pull the plunger back to the dose of regular insulin desired; inject the air into the clear insulin vial. • Leave the needle into the bottle, turn the vial upside down and slowly draw the desired dose of regular insulin. Check for air bubbles. • Hold the bottle upside down, insert the needle through the rubber stopper of the cloudy insulin vial, and pull the plunger back to the marking that indicates the total dose of insulin • Slowly pull down the plunger with index finger and middle finger.	Demonstration	Observing and listening	power point slides and pamphlets

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		Procedure for injecting Insulin • Sit comfortably and select the correct site for injection • Clean the site start in the middle of the area and then moving in a circular motion • Gently pinch up the area of the skin between your thumb, index and middle fingers. • Insert the needle through the skin at 90°. Slowly push plunger into plunger into inject the insulin • Do not massage the area and count till 5, before pulling the needle out • Release the pinch-up and press on alcohol swab over the injected spot • Remove the syringe. Clip off the syringe needle and dispose swabs. **AFTER CARE:** • Replace all the articles. Keep Insulin in a cool place or in a refrigerator • Wash hands and record insulin dose in your diary.		Observing and listening	Power point slides and pamphlets

Rakhf ,d;Rypd; nrYj;jp nfhs;tjw;fhd ghlj;jpl;lk;

APPENDIX - N

ghlj;jpl;lk;

jiyg;G	:	Rakhf ,d;Rypd; nrYj;jp nfhs;Sk; Kiw
gphpT	:	Rakhf ,d;Rypd; nrYj;jpf; nfhs;Sk; ePhpopT Nehahspfs;
mikg;G	:	ePhpopTj;Jiw> ntsp Nehahspfs; gphpT> muR ,uh[h[p nghJ kUj;Jtkid kJiu -20
,lk;	:	ePhpopTj;Jiw> ntspNehahspfs; gphpT – Nghjid ,izg;gfk;
Neuk;	:	45 epkplq;fs;
Nghjid Kiw	:	fye;jha;T kw;Wk; nra;Kiw tpsf;fq;fs;
xyp> xsp cgfuzq;fs;	:	klf;F tpsf;fg;glq;fs;> Jz;L gpuRuq;fs; kw;Wk; kbf;fzpzp %yk; tpsf;Fjy;

nghJNehf;fq;fs;:-

ePhpopT Neha; gw;wpa tpsf;fk;>tpUg;gkhd mZFKiw> jpwd;fs; mgptpUj;jp Mfpatw;Wld; Rakhf ,d;Rypd; nrYj;jp nfhs;tJ njhlh;ghd eilKiw gapw;rp.

Fwpg;gpl;l Nehf;fq;fs;:-

1. ePhpopT Nehia tiuaWj;jy;
2. ePhpopT Nehapw;fhd fhuzq;fs;
3. ePhpopT Nehapd; tiffs;
4. rpfpr;irf;fhd ,yf;Ffs;
5. ePhpopT Nehapw;f;fhd mwpFwpfs;
6. ePhpopT Neha; mwptjw;fhd Ma;T ghpNrhjidfs;
7. ePhpopT Nehapd; rpfpr;ir Kiwfs;
8. ePhpopT Nehapdhy; Vw;gLk; rpf;fy;fs;
9. “,d;Rypd; Rakhf nrYj;jpf; nfhs;Sjy;” kw;Wk; “,d;Rypd;” vd;gjd; nghUs;
10. ,d;Rypd; kUe;jpd; tiffs;
11. ,d;Rypd; ghJfhf;Fk; Kiwfs;
12. ,d;Rypd; clypy; Nghl;Lf; nfhs;Sk; ,lq;fs;
13. ,d;Rypd; Row;rp Kiwapy; nrYj;jg;gl Ntz;ba ,lq;fs;
14. ,d;Rypd; Crpia gad;gLj;Jtjhy; Vw;gLk; rpf;fy;fs;

15. ,d;Rypd; Crpia Rakhf nrYj;jp nfhs;Sk; nray;Kiw tpsf;fk;

Kd;Diu

ePhpopT Neha; vd;gJ tho;f;if juj;ij ghjpf;Fk; cyfshtpa NehahFk;. czTf;fl;Lg;ghL> clw;gapw;rp> kUe;Jfs; kw;Wk; tho;f;if Kiw khw;wk; Mfpatw;iw nfhz;lNj ePhpopT Nkyhz;ik vdg;gLk;. tha;top kUe;Jfs; kw;Wk; ,d;Rypd; Mfpait ePhpopT Neha;f;fhd kUe;Jfs; MFk;. ,d;Rypd; kUe;jhdJ gy;NtW Kiwfspy; eph;tfpf;fg;gLfpd;wJ. nghJthf Njhypd; mbapy; nrYj;Jk; Crp KiwNa gpd;gw;wg;gLfpwJ. ,d;Rypd; Crp nrYj;jp nfhs;Sk; NghJ rhpahd Kiwapy; gad;gLj;Jk; njhopy;El;gk; filgpbf;fg;glNtz;Lk;. ,y;iynad;why; gydw;w rpfpr;ir KiwAk;> rpf;fy;fSk; Vw;gLk;. Rakhf ,d;Rypd; nrYj;jpf; nfhs;Sk; ePhpopT Nehahspfs;> ,d;Rypid Rakhf nrYj;jp nfhs;Sk; eph;thf mwpT kw;Wk; njhopy;El;g mwpT njhpe;J ,Uj;jy; kpf mtrpakhFk;. nrtypah;fs;> ePhpopT NehahspfSf;F rhpahd gapw;;rpf; fy;tp Kiwia fw;gpj;jy; mtrpakhFk;. ,g;ghlj;jpl;lj;jpy; Rakhf ,d;Rypd; nrYj;jpf; nfhs;Sjy; njhlh;ghf gy;NtW mk;rq;fis gw;wp ,q;F tpthjpf;f ,Uf;fpd;Nwhk;.

gphpT

ghlj;jpl;lk; - tpsf;Fjy;

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
1.	ePhpopT Nehia tiuaWj;jy;	ePhpopT Neha;: ePhpopT Neha; vd;gJ khTg;nghUs;> Gujk;> nfhOg;G Mfpatw;wpd; jd;kakhjypy; Vw;gLk; FiwghL MFk;. ,J ,d;Rypd; cw;gj;jpf;Fk;> ,d;Rypd; Fiwghl;bw;Fk; cs;s yhq;fh; fhd; jpl;Lf;fspy; cs;s gPl;lh nry;fspdhy; Ruf;fg;gLfpd;wJ.	tpsf;Fjy; kw;Wk; fye;Jiu ahly;	ftdpj;jy; cw;W Nehf;Fjy;	klf;F tpsf;fg; glq;fs; 
2.	ePhpopT Nehapw;fhd fhuzq;fs;	ePhpopT Neha;f;fhd fhuzq;fs;: ❖ ePhpopT Neha; njhlh;ghd FLk;g tuyhW ❖ clw;gUkd; (≥ 20% Njitahd cly; vil FwpaPl;L vz; ≥ 27 fp.fp/ kP^2) ❖ ,dk; kw;Wk; ghuk;ghpak; ❖ taJ ≥ 45 tUlq;fs; ❖ Vw;wj;jho;thd tpuj epiyapy; FSf;Nfh]; ❖ cah; ,uj;j mOj;jk; (≥ 140/90kp.kP n`fp) ❖ cah; mlh;epiy nfhOg;G msT ≥ 35 kp.fp/nlrp.yp	tpsf;Fjy; kw;Wk; fye;Jiu ahly;	ftdpj;jy; kw;Wk; cw;WNehf; Fjy;	klf;F tpsf;fg; glq;fs;

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
		❖ fh;g;gfhy ePhpopT Neha; gw;wpa tuyhW			
3.	ePhpopT Neha; rpfpr;irf;fhd ,yf;Ffs;	ePhpopT Neha;f;fhd rpfpr;ir ,yf;Ffs;: ❖ ePhpopT Nehahspfspd; tho;f;ifj;juj;ij cah;j;Jjy; ❖ ePhpopT Nehahspfs; mth;fs; Ghpe;J nfhs;Sk; Kiwapy; gq;Nfw;fr; nra;jy;. ❖ ePhpopT Nehahspfspd; Neha; gw;wpa jfty; mwpjy; • jdpg;gl;l Nrhjid • nghUshjhu kjpg;G • ePhpopT Neha; fz;lwpe;j ehs; Kjy; jpwd;kpFRa Nkyhz;ik gapw;rp ngw;wpUf;f Ntz;Lk;. • Foe;ij gUtj;jpy; ,Ue;J ,sk; gUtj;jpdh; kw;Wk; taJ te;Njhh; gUtk; tiuahd khw;wq;fis vspikg;gLj;Jk; topfs; ,uj;j rh;f;fiuia fl;Lg;ghl;by; itg;gNj ePhpopT Nehahspfspd; xl;Lnkhj;j ,yf;F MFk;.	tpsf;Fjy; kw;Wk; fye;J ciuahly;	ftdpj;jy;	fye;jha;T

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
4.	ePhpopT Nehapd; tiffs;	ePhpopT Nehapd; tiffs;: ☸ rhh;G 1 tif ☸ rhh;G 2 tif ☸ njhlh;G tif ☸ fh;g;gfhy tif ☸ gOjile;j FSf;Nfh]; Vw;Gtif (IGT) ☸ Kd; ePhpopT tif ☸ tpuj epiy tif – 100 – 125 kpfp/nlrpyp ☸ rhg;gpl;l gpd; 2kzp Neuj;jpw;F gpwF cs;s uj;jj;jpd; rh;f;fiu msT. 140 – 199 kpfp/nlrpyp	tpsf;Fjy; kw;Wk; fye;J ciuahly;	cw;W Nehf;Fjy; kw;Wk; ftdpj;jy;	klf;F tpsf;fg; glq;fs;
5.	ePhpopT Nehapw;fhd mwpFwpfs;	ePhpopT Nehapw;fhd mwpFwpfs; 1. mjpf msT rpWePh; ntspahFjy;(ghyp A+hpah) 2. mjpfkhd jhfk; (ghypbg;rpah) 3. mjpfg;grp (ghypNg[pah) kw;iwa mwpFwpfs;:	tpsf;Fjy;	ftdpj;jy; kw;Wk; cw;W Nehf;Fjy;	klf;F tpsf;fg; glq;fs; 

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
	njhlh;;r;rp	• fisg;G • gytPdk; • fz;ghh;it kq;Fjy; • if my;yJ fhy;fspy; kjkjg;G kw;Wk; kuj;JNghjy; • cyh;e;j Njhy; • mhpg;G • Njhy;Gz;fs; • Mwhjg;Gz; • mbf;fb Vw;gLk; Neha; njhw;W • jpBh; vil Fiwjy; – tif 1(vil Fiwjy;> Fkl;ly;> the;jp kw;Wk; tapw;W typ) • rpWePh; fopf;Fk; ,lj;jpy; mhpg;G Vw;gLjy;			

<table>
<tr><th>t. vz;</th><th>Fwpg;gpl;l Nehf;fq;fs;</th><th>nghUslf;fk;</th><th>fw;gpg;gthpd; nray;</th><th>fw;gth;fs; nray;ghL</th><th>fw;gpg;gthpd; cgfuzq;fs;</th></tr>
<tr><td>6.</td><td>ePhpopT Neha; mwptjw;fhd Ma;T ghpNrhjidfs;</td><td>ePhpopT Neha; mwptjw;fhd Ma;T ghpNrhjidfs;:
<table>
<tr><th></th><th>,ay;G epiy</th><th>gOJ epiy</th><th>ePhpopT epiy</th></tr>
<tr><td>,uj;jj;jpy; rhg;gplhky; rh;f;fiuapd; msT</td><td>< 100</td><td>100 – 125kpfp/ nl.yp</td><td>≥ 126 (70mol/l)</td></tr>
<tr><td>rhg;gpl;l 2 kzpNeuj;jpw;Fgpd; ,uj;jj;jpy; rh;f;fiuapd; msT 75% rh;f;fiuAld; ($Ljy; kp.fp/nlrp.yp)</td><td>< 140</td><td>140 – 199 kpfp/ nl.yp</td><td>≥ 200 (11.1mol/l)</td></tr>
</table></td><td></td><td></td><td></td></tr>
<tr><td>7.</td><td>ePhpopT Nehia fl;Lg;gLj;Jk; topKiwfs;</td><td>ePhpopT Nehia fl;Lg;gLj;Jk; topKiwfspy; Kf;fpakhdit - czTf;fl;Lg;ghL> clw;gapw;rp> kUe;Jfs;</td><td></td><td></td><td>  </td></tr>
</table>

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
	njhlh;r;rp	 *czTf;fl;Lg;ghL:* • **khTr;rj;J - 50 – 60%** • **Gujr;rj;J - 20 - 30%** • **nfhOg;Gfs; - 10 – 25%** **,tw;wpd;nkhj;j fNyhhpfspd; kjpg;Ng clypd; vilkw;Wk; nray;ghl;il jPh;khdpf;fpwJ.** *czTj;jpl;lkplypd; mk;rq;fs;:* ☛**cly;vil FwpaPl;L vz; /vil kw;Wk; fp.fpuhk;/cauk; kPl;lh;^{2}**			

<table>
<tr><th>t. vz;</th><th>Fwpg;gpl;l Nehf;fq;fs;</th><th>nghUslf;fk;</th><th>fw;gpg;gthpd; nray;</th><th>fw;gth;fs; nray;ghL</th><th>fw;gpg;gthpd; cgfuzq;fs;</th></tr>
<tr><td></td><td>njhlh;r;rp</td><td>☛nray;jpwd;
☛taJ kw;Wk; ghypdk;
☛jw;Nghija czTg;gof;fq;fs;
☛nghUshjhu epiy
☛ePhpoptpdhy; Vw;gLk; rpf;fy;fs;
☛ePhpoptpw;fhd rpfprir Kiwfs;
eltbf;iffs;
<table>
<tr><th>gphpT</th><th>Fiwthd gzp (fpNyh fNyhhp fspy;)</th><th>kpjkhd gzp (fpNyh fNyhhp fspy;)</th><th>mjpfkhd gzp (fpNyh fNyhhp fspy;)</th></tr>
<tr><td>fd cly; gUkd; epiy</td><td>25</td><td>30</td><td>35</td></tr>
<tr><td>ruhrhp cly; vil epiy</td><td>30</td><td>35</td><td>40</td></tr>
<tr><td>vilaw;w epiy</td><td>35</td><td>40</td><td>45</td></tr>
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Nrh;f;fNtz;ba czTfs;:
☛ rg;ghj;jp> ghfw;fha;> fPiu tiffs;> gr;ir</td><td></td><td></td><td></td></tr>
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<tr><th>t. vz;</th><th>Fwpg;gpl;l Nehf;fq;fs;</th><th>nghUslf;fk;</th><th>fw;gpg;gthpd; nray;</th><th>fw;gth;fs; nray;ghL</th><th>fw;gpg;gthpd; cgfuzq;fs;</th></tr>
<tr><td></td><td>njhlh;r;rp</td><td>fha;fwpfs;> fj;jhpf;fha;> KUq;iffha; jtph;f;fNtz;ba czTfs;:
☛ ,dpg;Gfs;> Nff;Ffs;> rhf;nyl;fs;> l];fphPk;fs; [hk; tiffs;> ghyhilf;fl;b> nea;> goq;fs;> khk;goq;fs;> thiog;goq;fs;> kw;Wk; kJghdq;fs;
☛ jho;epiy rh;f;fiu cs;sth;fs; Nrh;j;J nfhs;s Ntz;ba MW rpwpa czTg;gof;fq;fs;
<table>
<tr><td>jhdpaq;fSk; gUg;G tiffSk; -</td><td>6 -11 ghpkhWjy;fs;</td></tr>
<tr><td>fha;fdpfs;</td><td>3 – 5 ghpkhWjy;fs;</td></tr>
<tr><td>goq;fs;</td><td>2-4 ghpkhWjy;fs;</td></tr>
<tr><td>ghy; kw;Wk; ghyhilf;fl;b</td><td>2-3 ghpkhWjy;fs;</td></tr>
<tr><td>ML> Nfhop ,iwr;rp</td><td>2-3 ghpkhWjy;fs;</td></tr>
<tr><td>kPd; vz;nza;> ,dpg;Gfs;</td><td>fl;Lg;ghLld; $ba czTgad;ghL</td></tr>
</table>
czTf;fl;Lg;ghLfs;:
❁ jdpg;gl;l ePhpopT NehahspfSf;Nfw;g</td><td></td><td></td><td></td></tr>
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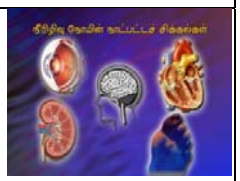
t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
		Nkyhz;ik Fwpf;Nfhs;fs; khWgLtJ **☸ Kf;fpa ey;y cl;nghUl;fis toq;Fjy;** **☸ cfe;j> tsh;rpij fl;Lg;ghl;il mila nray;gLj;Jjy;** **☸ nghUj;jkhd Mw;wYld;> MNuhf;fpakhd tsh;r;rp kw;Wk; nray;jpwDf;F Njitahd Cl;lr;rj;J toq;Fjy;** **☸ rhjhuz uj;j FSf;Nfh]; kl;lj;ij miltjw;fhd guhkhpg;G Kiwfs;** **☸ jho;epiy rh;f;fiu kw;Wk; cah;epiy rh;f;fiu epiyia jtph;j;jy;** *clw;gapw;rpfs;:* **jpl;lkpl;l clw;gapw;rpfs; ,uz;L tifg;gLk;.** **1. fhw;W clw;gapw;rpfs;** **2. fhw;Wg;Gfh clw;gapw;rpfs;** *1.fhw;W clw;gapw;;rpfs;:*			

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
	njhlh;r;rp	tpWtpWg;ghd eilgapw;rp –1kzpNeuk; 200 fNyhhpfs; nkJthd eilgapw;rp- 10 epkplq;fs; Ntfkhd eilgapw;rp- 35 epkplq;fs; Xa;ntLj;jy; - 10 epkplq;fs; irf;fps; Xl;Ljy;> nkJthd eilgapw;rp (25kP – 150 fNyhhpfs;) XLnghwpgb> gbVWjy;> ePr;ry; - 240 fNyhhpfs; kpjkhd nghpath;fs; nra;af;$ba clw;gapw;rp *2.tajhdth;fs; jtph;f;fNtz;ba clw;gapw;rpfs;:* • jirfis tphpTgLj;Jk; clw;gapw;rp> gS Jhf;Fjy; kw;Wk; ky;Aj;jk; • cah;,uj;j mOj;j Nehahspfs;> • tpopj;jpiu Nehahspfs;> • ,jaf;NfhshW Nehahspfs;> • rpWePuf nray; ,og;G Nehahspfs;> • 65tajpw;F Nkw;gl;lth;fs;			

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
	njhlh;r;rp	*ePhpopT NehahspfSf;F clw;gapw;rpapdhy; Vw;gLk; ed;ikfs;:* **1. clypd; vilia Fiwf;fpwJ** **2. rh;f;fiuia fl;Lg;gLj;JfpwJ** **3. khj;jpiufspd; Njitia Fiwf;fpwJ** **4. ,uj;j Xl;lj;ij rPuhf;FfpwJ** **5. ,jaj;jpd; nray;jpwid mjpfhpf;fpwJ** **6. ,uj;jf;nfhjpg;ig Fiwf;fpwJ** **7. ey;y nfhOg;G rj;ij (HDL) mjpf khf;FfpwJ** **8. nfl;l nfhOg;G rj;ij Fiwf;fpwJ** **9. MNuhf;fpakhd tho;tpw;F mbNfhYfpwJ.** *Fwpg;G: kUj;Jth; $wpa MNyhridia ngwf;$bath;fs;* • **35 tajpw;F Fiwthdth;fs;** • **ePz;l Neu clw;gapw;rp nra;a Kbahjth;fs;** • **czh;r;rpaw;w ghj njhlh;ghd rpf;fy;fis nfhz;bUg;gth;fs;**			

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
	njhlh;r;rp	**kUe;Jfs;:** **1. ePhpopT khj;jpiufs;** **2. ,d;Rypd; Crp** *1.ePhpopT khj;jpiufs;:* **,d;Rypd; rpwg;G kUe;Jfs;:** • **ry;giddy;Nyhhpah** • **fpspg;ngz;fpspikL** • **fpspg;gpirL** **,d;Rypd; Jhz;Lk; kUe;Jfs;** • **nkl;ghh;kpd;** • **mfh;Ngh];** **,d;Rypd; rpfpr;irf;F ,d;Rypd; Crp tbtpy; fpilf;fpwJ.**			
8.	**ePhpopT Nehapdhy; Vw;gLk; rpf;fy;fs;**	**ePhpopT Nehapdhy; Vw;gLk; rpf;fy;fs;** **1. jho;epiy rh;f;fiu – (63kpfp/nlrp.yp)** **2. cah;epiy rh;f;fiu – (200kpfp/nlrp.yp) rhg;gpl;l 2kzpNeuj;jpw;F gpd; ,uj;jj;jpy; cs;s rh;f;fiuapd; msT**	**tpsf;Fjy;**	**fye;jhNyhr pj;jy;**	**klf;Ftpsf;fg; glq;fs;**

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
	njhlh;r;rp	3. rhh;G 1 tif – lagbf; fPl;Nlh mrpNlhrp]; (DKA) - i`g;gh; fpisrPkpf>; i`g;gh; M];Nkhyhh;> ehd; fPl;Nlhapf; rpd;l;Nuhk; 4. ,uj;j Ez;Foha; rpf;fy;fs; - tpopj;jpiu ghjpg;Gfs; - fhy; euk;G ghjpg;Gfs; - rpWePuf ghjpg;Gfs; - euk;G kz;ly ghjpg;Gf;fs; 5. ,uj;j ngUq;Foha; rpf;fy;fs; - ,ja rpiu ghjpg;Gfs; - ngU%is ,uj;jehs ghjpg;Gfs; - Gw euk;G jow;rp – ePhpopT fhy; Neha;			

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
	njhlh;r;rp				

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
	njhlh;;r;rp	*1.jho; rh;f;fiu epiy (i`g;NghfpisrPkpah)* **ntF Jhpjkhf ,uj;jj;jpy; cs;s FSf;Nfh]; FiwtJ my;yJ kpff;Fiwe;j ,uj;j FSf;Nfh]; msthdJ 50 – 60 kp.fp / nlypf;F fPohf Fiwtij jho;epiy rh;f;fiu vdg;gLk;.** **mwpFwpfs;:** ☸ **kaf;fk;** ☸ **Fsph;tpah;j;jy;** ☸ **ghh;it kq;Fjy;** ☸ **jiytyp** ☸ **jiyr;Rw;wy;** ☸ **grp** ☸ **Ms; kaf;fk;** ☸ **fisg;G** ☸ **Raepiy khw;wq;fs;**			

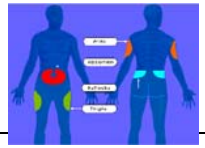
t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
	njhlh;r;rp	**Kd;ndr;rhpf;iffs;:** **1. jho; rh;f;fiu epiyia gw;wp njspthf njhpe;J nfhs;Sjy;** **2. czT kw;Wk; kUe;J> Neuj;Jld;> msTld; filgpbj;jy;** **3. vg;nghOJk; vspa fhh;Nghi`l;Nul; nghUl;fshd 15fpuhk; rh;f;fiu/ ,uz;L kpl;lha;fis iftrk; itj;J ,Uj;jy;** **4. ePz;l tpisahl;L eltbf;iffspd; nghOJ ,ilapilNa Xa;ntLj;jy;> ePh; gUFjy; kw;Wk; nghwpf;Fk; czit cl;nfhs;Sjy;** **5. FSf;Nfh]; Crpia jahh; epiyapy; itj;J ,Uj;jy;** **6. ,e;j Nehapd; jd;ik kw;Wk; rpf;fy;fis FLk;g cWg;gpdh;fSf;F Nghjpj;jy;.** **7. vg;nghOJk; kUj;Jt milahs ml;ilia iftrk; itj;J ,Uj;jy;.** *epidtpy; nfhs;s Ntz;bait*			

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
	njhlh;r;rp	☸ ,uj;jj;jpy; cs;s rh;f;fiuapd; msit Nrhjpj;jy; ☸ vspa fhh;Nghi`l;Nul;Lfis cz;Zjy; ☸ gag;glhky; vjph;tpid nray;fis nra;ahjpUj;jy; ☸ kUj;Jth; my;yJ fy;tpahsUld; fye;jhNyhrpj;jy; *cah;epiy rh;f;fiu (i`g;NghfpisrPkpah)* ,uj;j FSf;Nfh]; msthdJ rhg;gpLtjw;F Kd; <125kpyp/nlrp.yp my;yJ ,uz;L kzpNeu cztpw;Fgpd; ,uj;jj;jpy; cs;s rh;f;fiuapd; msthdJ <200kpyp/nlrp.yp ,Ue;jhy; cah;epiy rh;f;fiu vdg;gLk;. *lahgbf; fPl;Nlh mrpNlhrp];* ,J ,d;Rypd; my;yhj my;yJ Fiwe;j msthy; Vw;gLk; Neha;. ,uj;j rh;f;fiu %d;W Kf;fpa nray;ghLfs;: 1. ,uj;j rh;f;fiu kpifahtjhy; 2. twz;L NghFjy; 3. mkpy Neha;			

<table>
<tr><th>t. vz;</th><th>Fwpg;gpl;l Nehf;fq;fs;</th><th>nghUslf;fk;</th><th>fw;gpg;gthpd; nray;</th><th>fw;gth;fs; nray;ghL</th><th>fw;gpg;gthpd; cgfuzq;fs;</th></tr>
<tr><td>9.</td><td>,d;Rypd; Rakhf nrYj;jpf; nfhs;Sjypd; mh;j;jk; kw;Wk; ,d;Rypd; vd;gjd; nghUs;. njhlh;r;rp</td><td>,d;Rypd; Rakhf nrYj;jpf; nfhs;Sjy;
,d;Rypd; vd;gJ fizaj;jpy; Ruf;fpd;w xU tifahd `hh;Nkhd;. ,J fizaj;jpy; cs;s yhq;fh; `hd; jpl;Lf;fspy; cs;s gPl;lh nry;fspdhy; Ruf;fg;gLfpwJ.

Rakhf ,d;Rypd; nrYj;jpf;nfhs;jypd; nghUs;:
ahUila cjtpAk; ,y;yhky; jdf;F jhNd Rakhf ,d;Rypd; Crpia ePhpopT Nehahspfs; nrYj;jpf;nfhs;Sjy;.</td><td>tpsf;Fjy;</td><td>ftdpj;jy;</td><td>fye;jha;T</td></tr>
<tr><td>10.</td><td>,d;Rypd; Crpapd; tiffs;</td><td>,d;Rypd; Crpapd; tiffs;
<table>
<tr><th rowspan="2">tiffs;</th><th rowspan="2">kUe;Jfs;</th><th colspan="4">jahhpg;G Kiwfs;</th></tr>
<tr><th>njhlf;fk;</th><th>cr;repiy</th><th>fhymsT</th><th>Njhw;wk;</th></tr>
</table></td><td>tpsf;Fjy;</td><td>ftdpj;jy;</td><td>fye;jha;T</td></tr>
</table>

<table>
<tr><th>t. vz;</th><th>Fwpg;gpl;l Nehf;fq;fs;</th><th>nghUslf;fk;</th><th>fw;gpg;gthpd; nray;</th><th>fw;gth;fs; nray;ghL</th><th>fw;gpg;gthpd; cgfuzq;fs;</th></tr>
<tr><td></td><td>njhlh;r;rp</td><td>
<table>
<tr><td>tpiuthf nray;jpwd;</td><td>yp];g;Nuh (`pA+Nkh yhf;) m];ghl; (Nehtyhf;</td><td>10-15
5-15</td><td>1hr
40-50 m</td><td>2-4 hr
2-4 hr</td><td>njspthdJ</td></tr>
<tr><td>nkJthf nray;jpwd;</td><td>Nehthypd; (<ukhdJ)</td><td>1/2 – 1</td><td>2- 3 hr</td><td>4-6 hr</td><td>njspthdJ</td></tr>
<tr><td>,ilepiy nray;jpwd;</td><td>(NPH) Neutral protomin Hagedon</td><td>2-4 hr</td><td>4-6 hr</td><td>16-20 hrs</td><td>ke;jhukhd</td></tr>
<tr><td>ePz;l tpiuthd nray;jpwd;</td><td>fpyhh;[pd; nly;bkph;</td><td>1hr</td><td>cr;repiy ,y;iy</td><td>24 hr</td><td>ke;jhukhd</td></tr>
</table>
</td><td></td><td></td><td></td></tr>
<tr><td>11.</td><td>,d;Rypd;</td><td>,d;Rypd; Nrkpg;gpd; mk;rq;fs;:</td><td>tpsf;Fjy;</td><td>ftdpj;jy;</td><td>fye;J</td></tr>
</table>

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
	Nrkpg;gpd; mk;rq;fs; njhlh;r;rp	,d;Rypid ciwepiyapNyh my;yJ 80°F ntg;gepiyf;F NkyhfNth itf;ff; $lhJ. ngUk;ghYk; ,d;Rypid Fsph;g;gjd ngl;bapd; fPo; miwapy; itf;fg;glyhk; my;yJ #hpa xsp glhj Fsph;r;rpahd epoy; gFjpapy; ghJfhf;fg;gl Ntz;Lk;. ,d;Rypd; Crpia gad;gLj;Jk; Kd; Fsph;rhjdg; ngl;bapy; ,Ue;J vLj;J miuntg;gepiyapy; rpwpJ Neuk; itf;fg;glNtz;Lk;. ,uz;L Fg;gpfspYk; cs;s ,d;Rypd; Mw;wy; kw;Wk; ntz;ikahd tPo;g;gbTfis Nrhjpj;J mwpa Ntz;Lk;. NkYk; jpwf;fg;gl;l ,d;Rypd; Fg;gpia xUkhj;jpw;Fs;shf gad;gLj;jp tplNtz;Lk;. jpwf;fg;glhj Gjpa ,d;Rypd; Fg;gpfis gykhjq;fs; tiu gad;gLj;jyhk;.			MNyhrpj;jy;
12.	,d;Rypd; Crpia clypy; nrYj;j Ntz;ba ,lq;fs;	,d;Rypd; Crpia clypy; nrYj;j Ntz;ba ,lq;fs; 1. tapw;Wg;gFjp – kpf tpiuthd cwpQ;Rk; jd;ik	tpsf;Fjy;	ftdpj;jy;	fzpzp tpsf;fg; glq;fs; 

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
		2. njhilg;gFjp – nkJthd cwpQ;Rk; jd;ik 3. ifg;gFjp – kpjkhd cwpQ;Rk; jd;ik 4. Gl;lg;gFjp – nkJthd cwpQ;Rk; jd;ik			
13.	,d;Rypd; Crpia clypy; Row;rp Kiwapy; Nghl;Lf; nfhs;Sk; ,lq;fs; njhlh;r;rp.	1.tapw;Wg;gFjp ☸ tapw;Wg;gFjpapy; Vuhskhd Njhy;mb jpRf;fs; cs;sjhy; ,d;Rypd; cwpQ;Rk; jd;ik mjpfhpg;gjhy; Mgj;J FiwT. ☸ tpiuthd ,d;Rypd; cwpQ;rg;gLk; jd;ik ☸ njhg;GSf;F ,uz;L mq;Fy Jhuj;jpy; Crpapid nrYj;Jjy; Ntz;Lk; 2.ifg;gFjp (kw;wth; cjtpAld;) ☸ ifapd; Njhs;gl;il Nky;gFjpapy; Fj;jg;glNtz;Lk; ☸ ,q;F kpf nky;ypa Njhyb jpRf;fs; (Subcutaneous) cs;sd ☸ xt;nthU Crp Fj;jypd; NghJk; eLtpuy;> kw;Wk; fl;iltpuy; Ms;fhl;b“fps;sp	tpsf;Fjy;	ftdpj;jy;	fzpzptop tpsf;fg; glq;fs;

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
	njhlh;r;rp	ms;Sjy;”(PINCHUP) Nghy rijia Jhf;fp gpbf;f Ntz;Lk;. ☸ cauk; Fiwe;j Crpfis nfhz;Nl fPog;gFjpapy; ,d;Rypd; Crp Fj;jg;glNtz;Lk; 3.njhilg;gFjp ☸ njhilg;gFjpapd; Kd;Gwk; kw;Wk; gf;fthl;L Kfkhf Crpia nrYj;j Ntz;Lk;. 4. Gl;lk;gFjp (kw;wth; cjtpAld;) ☸ ,e;j gFjpapy; “fps;sp ms;Sjy;”(PINCHUP) nra;ahky; ghJfhg;ghf Crp Fj;jg;gl Ntz;Lk; ☸ ,d;Rypd; cwpQ;Rk; jd;ik ,e;jg;gFjpapy; xg;gPl;lstpy;; kpff;FiwthFk;. ☸ NkYk; xNu ,utpy; njhw;W Vw;gl tha;g;Gz;L. Crp Fj;jg;gLk; ,lq;fs; Kiwahf Row;rp Kiwapy; gad;gLj;jg;gl;lhy;,d;Rypdpd; cwpQ;Rk; jd;ik> epiy ngWk; rPuw;w Kiwapy; Row;rpahd 1. xNu ,lj;jpy; ,d;Rypd; Crpia 1-2 thuq;fs;			

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
	njhlh;r;rp	gad;gLj;jyhk; 2.xt;nthU KiwAk; xNu ,lj;jpy; nrYj;jhky; ,lk; tpl;L ,lk; efh;j;jp Gjpa gFjpfspy; Fj;jg;glNtz;Lk;. 3.1-2 thuq;fSf;F gpwF Crp nrYj;jg;gLk; ,lj;ij clypy; NtW ,lj;jpw;F khw;wp nfhs;s Ntz;Lk;. 4.xt;nthU ehSk; xt;nthU ,lj;jpy; jhd; Fj;jg;glNtz;Lk;.			
14.	,d;Rypd; Crpia Rakhf gad;gLj;Jtjhy; Vw;gLk; rpf;fy;fs;	,d;Rypd; Crpia Rakhf gad;gLj;Jtjhy; Vw;gLk; rpf;fy;fs; 1. xt;thik rpf;fy; - rptj;jy;> tPf;fk;> Njhy; jbj;jy;. Njhy; mhpg;G 2. NehAld; $ba xt;thik rpf;fy; - ,d;Rypd; ypg;Nghb];bNuhgp 3. ypg;Nghml;Nuhgp (nfhOg;G jir tYtpog;G)	tpsf;Fjy;	fye;jhNyhr pj;jy;	fzpzp %yk; tpsf;Fjy; kw;Wk; Jz;L gpuRuq;fs; tpepNahfpj;jy;

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthp d; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
		4. ypg;Nghi`g;gh;bNuhgp (nfhOg;G jir tPf;fk;)			

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
15.	,d;Rypd; Crpia Rakhf eph;tfpj;jy;	*Muk;g fl;l Kiwfs;* ❁ Njitahd nghUl;fis Nrfhpf;fTk; (,d;Rypd; Crpf;Foha;> Crp> rpwpa gQ;R cUz;ilfs;> My;f`hy;> ,d;Rypd; kUe;J> fhfpjig) ❁ kUj;Jthpd; mwpTiuapy; Njjp> Neuk;> kUe;jpd; msT kw;Wk; ,d;Rypd; tifia rhpghh;f;fTk;. ❁ ,d;Rypd; Fg;gpapy; Nygps; Njhw;wk; ghh;f;fTk; ❁ ,d;Ryd; Fg;gpia jpwe;j Njjpia ghh;f;fTk; ❁ ,d;Rypd; Crpf;Fg;gpwF 15-30 epkplq;fSf;Fs; cz;z czT jahuhf itf;f Ntz;Lk; ❁ Kw;wpYk; ifia fOtTk; ❁ ,d;Rypd; Fg;gpia ,U iffSf;fpilapy; itj;J ed;whf cUl;l Ntz;Lk;	nray;Kiw tpsf;fk;	ftdpj;jy;	kbf;fzpzp tpsf;fg; glq;fs; 

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
	njhlh;r;rp	*,d;Rypid Crpr;Foha;f;Fs; epug;Gtjw;F xNu tif ,d;Rypd; (jdpahf)* ❁ **,d;Rypd; ghl;bypd; Nky; ug;gh; gFjpia My;f`hy; gQ;R itj;J Jilf;fTk;** ❁ **Crpf;Fohia Ngdhitg;Nghy; gpbf;fTk;. Fg;gpia jl;ilahd gug;gpy; itf;fTk;** ❁ **,d;Rypd; msTf;F rkkhf fhw;iw Crpf;Foha;f;Fs; ,Of;fTk;.** ❁ **nkJthf Crp Fg;gpf;Fs; ghl;bypd; cNyhf tpspk;gpy; Kid njhlhjthW nrYj;jTk;.** ❁ **,d;Rypd; ghl;biy jiyfPohf gpbj;J nfhz;L nkJthf rPuhf Njitahd msT ,d;Rypid Crpf;Foha;f;Fs; fhw;Wf; Fkpo; ,y;yhky; ,Of;fTk;** ❁ **fhw;Wf;Fkpo;fs; ,Ue;jhy; Crpf;Fohapd; ,Oitia ghl;bYf;Fs; js;sptpl;L gpwF nkJthf ,Oj;J rhpahd msT kUe;ij ,Of;fTk;** ❁ **nghpa fhw;W Fkpo;fs; ,y;yhjthW kWKiw nra;aTk;**			

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
	njhlh;r;rp				

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
	njhlh;r;rp	❁ nkJthf Rl;Ltpuy; kw;Wk; eLtpuyhy; ,Oitia fPNo ,Of;fTk; *fyit ,d;Rypid Crpf;Fohapy; epug;Gtjw;F* ❁ ,U ,d;Rypd; ghl;by;fs; Nky;gFjpia My;f`hy; gQ;R nfhz;l Jilf;fTk; ❁ ke;jhukhd ,d;Rypd; msTf;F rkkhd msT fhw;iw Crpf;Foha;f;Fs; ,Of;fTk;. ❁ ke;jhukhd ,d;Rypd; Fg;gpapd; ug;gh; %b topahf Crpia Eioj;J fhw;iw cl;nrYj;jTk; ❁ ke;jhukhd ,d;Rypid cs;spOf;fhky; Crpia ePf;fTk; ❁ Crpf;Fohapd; ,Oitia kPz;Lk; tof;fkhd ,d;Rypd; msTf;F gpd; ,Oj;J fhw;iw njspe;j ,d;Rypd; ghl;bYf;Fs; nrYj;jTk; ❁ ghl;bYf;Fs; Crpia tpl;L gpwF Fg;gpia jiyfPohf;fp nkJthf Njitahd msT tof;fkhd ,d;Rypid vLf;fTk;. fhw;Wf;Fkpo; ,Uf;fpd;wjh vd;W Nrhjpf;fTk;			

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
	njhlh;r;rp	❁ ghl;biy jiyfPohf gpbj;J ug;gh; Nky;%b topahf Crpia nrYj;jp (ke;jhukhd ,d;Rypid ghl;bypd;) nkhj;j ,d;Rypd; msit Fwpg;gpl;L> Crpf;Fohapd; ,Oitia gpd;Df;F ,Of;fTk; ❁ Crpf;Fohapd; ,Oitia Rl;LtpuyhYk; eLtpuyhYk; nkJthf fPNo ,Of;fTk; *,d;Rypd; Crp NghLk; Kiw* ❁ trjpahf cl;fhh;e;J Crp NghLtjw;F rhpahd ,lj;ij Njh;e;njLf;fTk; ❁ Crp NghLk; ,lj;ij kj;jpapy; njhlq;fp gpd; tl;lkhf Rj;jk; nra;aTk; ❁ fl;iltpuy;> Rl;Ltpuy;> eLtpuYf;F ,ilapy; Njhiy nkJthf gpbj;J cah;j;jTk;. ❁ Crpia NjhYf;Fs; 90 bfphp Nfhzj;jpy; Eiof;fTk;. gpd; nkJthf Crpf;Fohapd; ,Oitia js;s ,d;Rypd; nrYj;jTk; ❁ Crpia ntspNa ,Og;gjw;F Kd; 5 tiu vz;zTk;. Crp Nghl;l gFjpia Nja;f;ff;$lhJ			

t. vz;	Fwpg;gpl;l Nehf;fq;fs;	nghUslf;fk;	fw;gpg;gthpd; nray;	fw;gth;fs; nray;ghL	fw;gpg;gthpd; cgfuzq;fs;
	njhlh;r;rp	❁ Njhiy cah;j;jpg;gpbj;jij jsh;j;jptpl;L My;f`hy; gQ;R nfhz;L Crp Nghl;l ,lj;ij mOj;jp gpbf;fTk; ❁ Crpf;Fohia mfw;wTk; Crpia fow;wp klf;fp mfw;wp gQ;ir mg;Gwg;gLj;jTk;. *rpfpr;irf;Fgpd; ftdpj;J nfhs;s Ntz;bait* ❁ vy;yh nghUl;fisAk; vLj;j ,lj;jpy; itf;fTk;. ,d;Rypd; Fg;gpia Fsph;e;j ,lj;jpy; my;yJ Fsph;rhjd ngl;bapy; jpUg;gp itf;fTk;. ❁ iffis Rj;jkhf fOtTk;. ,d;Rypd; Nghl;l tpguj;ij ehl;Fwpg;Ngl;by; Fwpf;fTk;. Fwpj;j Neuj;jpw;Fs; cztpid cz;zTk;.			

EXPLAINNINGTHE CORRECT METHODS ONSELF ADMINISTRATION OF INSULIN

DEMONSTRATING THE CORRECT METHODS ONSELF ADMINISTRATION OF INSULIN

OBSERVING THE CORRECT METHODS ON SELF ADMNISTRATION OF INSULIN

சுயமாக இன்சுலின் செலுத்திக் கொள்வதற்கான வழிமுறைகள்

இன்சுலின் சார்ந்த வகையினர் அனைவரும், இன்சுலின் தேவைப்படும் ஒரு சிலரும், எளிதாகவும், சுயமாகவும் இன்சுலின் செலுத்திக் கொள்ள முடியும். நம்முடைய வாழ்க்கையை பாதுகாக்கவும் மேலும் நீரிழிவினால் உடல்உறுப்புகள் பாதிக்கப்படுவதை தடுக்கவும் இன்சுலின் உதவுகிறது.

இன்சுலின், யூனிட்டுகள் என்ற அலகினால் அளக்கப்படுகிறது. இது வெவ்வேறு அடர்த்திகளில் கிடைக்கிறது. பொதுவாக உபயோகத்தில் உள்ளவை, ஒரு மில்லி லிட்டரில் 40யூனிட்டுகள் (U-40) அல்லது ஒரு மில்லி லிட்டரில் 100 யூனிட்டுகள் (U-100)இருக்கும் இன்சுலின் ஆகும். எப்போதும் ம-40 சிரிஞ்சை, U-40 இன்சுலினுக்கும், U-100 சிரிஞ்சை U-100 இன்சுலினுக்கும் மட்டுமே உபயோகப்படுத்த வேண்டும்.

ஆரம்பகட்ட முறைகள்

இன்சுலின் எடுத்துக்கொள்வதற்கு தேவையான பொருட்கள்

- இன்சுலின் குப்பி
- அல்கஹால் தேய்ப்பான் அல்லது பஞ்சு, ஸ்பிரிட்
- இன்சுலின் ஊசி

மருத்துவர் கூறியதுபோல் மருந்தின் தேதி, இன்சுலின் குப்பியின் லேபிள் மற்றும் இன்சுலினில் கலங்கல் இருப்பதை சோதிப்பது

இன்சுலின் குப்பியினை முதலாவதாக திறந்த தேதியை குறித்து வைப்பது.

உணவை தயார் நிலையில் வைத்திருத்தல்

கைகளை சுத்தமாக கழுவுதல்

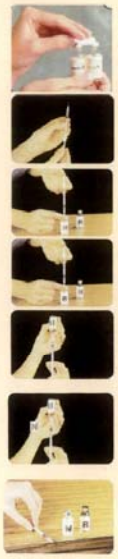
இன்சுலின் குப்பியினைக் கையில் வைத்து மிதமாக உருட்டுவது.

சிரிஞ்சில் இன்சுலினை நிரப்புவதற்கான வழிமுறை

- சிரிஞ்சினில் ஒரே வகையான இன்சுலின் மட்டும் எடுப்பதன் செயல்முறை
- இன்சுலின் குப்பி மேலே இருக்கும் ரப்பர் பகுதியை ஆல்கஹால் தேய்ப்பான் கொண்டு சுத்தப்படுத்தவும்.
- சிரிஞ்சினை பேனா போல் பிடித்து குப்பியினை சமமான மட்டத்தில் வைக்கவும்.
- உங்களுக்கு கொடுக்கப்பட்ட இன்சுலின் அளவிற்கேற்ப காற்றை சிரிஞ்சில் இழுக்க வேண்டும்.
- இன்சுலின் குப்பியினை நேராக வைத்து சிரிஞ்சிலுள்ள காற்றினை பாட்டிலினுள் செலுத்தவும்.
- இன்சுலின் குப்பியினை தலைகீழாகக் கவிழ்த்து (ஊசிமுனை இன்சுலின் மட்டத்திற்குக் கீழே இருக்க வேண்டியது அவசியம்) உங்கள் இன்சுலின் அளவிற்கேற்ப மெதுவாக இழுவையை ஆட்காட்டி மற்றும் நடுவிரல் கொண்டு இழுத்தல் வேண்டும்.
- சிரிஞ்சில் காற்று குமிழிகள் இருப்பின் அதனை அகற்றுவதற்காக விரலால் சிரிஞ்சை லேசாக தட்டி விடவும்.

இப்பொழுது சிரிஞ்சு இன்சுலின் செலுத்துவதற்கு தயாராக உள்ளது.

இரண்டு வகையான இன்சுலினை கலந்து நிரப்புவதற்கான செயல்முறை



- ஆல்கஹால் தேய்ப்பான் வைத்து இரண்டு இன்சுலின் குப்பிகளின் ரப்பர் பகுதிகளை சுத்தம் செய்யவும்
- உங்கள் கலங்கலான இன்சுலின் அளவிற்கேற்ப காற்றை சிரிஞ்சினால் எடுக்கவும்.
- கலங்கள் இன்சுலின் குப்பியை நேராக வைத்து ஊசியை அதனுள் செலுத்தி, காற்றினை பாட்டிலினுள் செலுத்தவும்.
- சிரிஞ்சினை இன்சுலின் எடுக்காமல் வெளியே எடுத்துவிடவும்.
- அடுத்து உங்கள் தெளிந்த இன்சுலின் அளவிற்கேற்ற காற்றினை சிரிஞ்சினில் எடுத்துக் கொண்டு அதை தெளிந்த இன்சுலின் குப்பியில் செலுத்தவும்.
- பிறகு தெளிந்த இன்சுலினை அளவிற்கேற்ப சிரிஞ்சினில் எடுத்துக்கொள்ளவும். அதன்பின் கலங்கள் இன்சுலினை தலைகீழாகக் கவிழ்த்து, ஊசியின் முனை இன்சுலின் மட்டத்திற்கு கீழே இருக்குமாறு ஊசியை குப்பியினுள் செலுத்த வேண்டும். பிறகு தேவையான அளவு கலங்கலான இன்சுலினை சிரிஞ்சினுள் எடுத்துக் கொள்ளவும்.

முதலில் தெளிந்த இன்சுலினை சிரிஞ்சினுள் எடுத்த பிறகு கலங்கள் இன்சுலினை எடுக்க வேண்டும்.
இப்பொழுது சிரிஞ்சு இன்சுலின் செலுத்துவதற்கு தயாராக உள்ளது.

இன்சுலின் செலுத்தப்பட வேண்டிய இடங்கள்

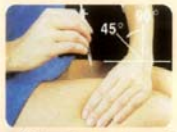
- இன்சுலின் செயல்பாடு அது செலுத்தப்படும் இடத்தைப் பொருத்தே உள்ளது. வயிற்றுப் பகுதியில் செலுத்தப்படும் இன்சுலின் செயல்பாடு மிக நன்றாக இருக்கும்.
- வயிற்றுப்பகுதியில் (தொப்புளைச் சுற்றி ஒரு அங்குலம் இடைவெளி விட்டு எடுத்துக் கொள்ளலாம்.)
- தொடையின் மேல்பகுதி மற்றும் வெளிப்புறங்கள்
- கைகளின் மேற்பகுதி (மற்றவர்களின் உதவியுடன் மட்டுமே செலுத்திக் கொள்ளலாம்.)

சுயமாக இன்சுலின் செலுத்தும் விதம்

- இன்சுலின் எடுத்துக்கொள்ளும் இடங்கள் மாறுபட்டாலும் செயல்முறை ஒன்றுதான்.

- ஊசி செலுத்த வேண்டிய இடத்தை தேர்வு செய்தல்.
- கைகளை சுத்தம் செய்து கொள்ளுங்கள்
- இன்சுலின் எடுத்துக்கொள்ளும் இடத்தை ஆல்கஹால் தேய்ப்பானால் சுத்தம் செய்யவும்.
- ஊசி செலுத்தப்பட வேண்டிய இடத்தை லேசாக கட்டைவிரல் மற்றும் நடுவிரல் ஆள்காட்டி விரல் கொண்டு சதையை கிள்ளி பிடிப்பது போன்று தூக்கி பிடித்துக் கொள்ளவும்

- பின் ஊசியை செங்குத்தாக 90°கோணத்தில் படத்தில் காட்டியதுபோல் இழுவையை அழுத்தி மருந்தை செலுத்த வேண்டும்.
- ஊசியை வெளியே எடுக்கும் முன்னர் 1 முதல் 5 வரை எண்ணவும்.



- இன்சுலின் செலுத்தப்பட்ட இடத்தில் ஆல்கஹால் தேய்ப்பன் வைத்து சிரிஞ்சை வெளியே எடுக்கவும்.
- இன்சுலின் செலுத்தப்பட்ட இடத்தை அழுத்தி தேய்க்காமல் இருப்பது நல்லது.
- சிரிஞ்சினை எடுத்து ஊசியினை கழற்றி அப்புறப்படுத்தவும்.

ஊசி போடும் இடம் கடினமாக, கட்டியாக, ஆகாமல் இருக்கவும் மற்றும் இன்சுலின் சிறந்த முறையில் உபயோகமாவதற்கும் இன்சுலின் செலுத்தும் இடங்களை மாற்ற வேண்டியது மிக அவசியமானது.

பிற்பாடு கவனத்தில் கொள்ள வேண்டியவை

மீண்டும் எடுத்த அனைத்தையும் (இன்சுலின் குப்பிகளை) அதன் இடங்களில் வைத்தல்.

கைகளை சுத்தமாக கழுவுதல். இன்சுலின் போடும் விவரங்களை குறிப்பேட்டில் குறித்தல்.

இன்சுலின் ஊசி போட்டு முடித்தவுடன் உணவினை 1/2 மணி நேரத்திற்குள் உட்கொள்ளவும்.

இன்சுலின் எடுத்துக் கொள்ளும் பொழுது கடைபிடிக்க மற்றும் தவிர்க்க வேண்டிய சில வழிமுறைகள்

கடைபிடிக்க வேண்டியவை	தவிர்க்க வேண்டியவை
உணவு உட்கொள்ளுவதற்கு அரைமணி நேரம் முன்பு இன்சுலின் எடுத்துக்கொள்ள வேண்டும். (அல்லது) உங்கள் மருத்துவர் கூறிய நேரப்படி எடுத்துக்கொள்ளவேண்டும்.	மருத்துவரின் ஆலோசனை இன்றி இன்சுலின் போடாமல் (அல்லது) இன்சுலின் போடுவதை நிறுத்துவது.
பொருத்தமான சிரிஞ்சுகளை உபயோகிக்கவும். எப்போதும் U-40 சிரிஞ்சை U-40 இன்சுலினுக்கும், U-100 சிரிஞ்சை U-100 இன்சுலினுக்கும் மட்டுமே உபயோகப்படுத்த வேண்டும்.	முனை மடங்கிய (அல்லது) மழுங்கிய சிரிஞ்சுகளை உபயோகிப்பது.
இன்சுலினை குளிர்சாதனப் பெட்டியின் (Refrigerator) பக்கவாட்டு அறைகளில் வைப்பது நல்லது. (அல்லது) இன்சுலினை பிளாஸ்டிக் பையினுள் வைத்து, நன்றாக மூடி, குளிர்ந்த நீர் இருக்கும் பானையில் போட்டு வைக்கலாம்.	குளிர்சாதனப் பெட்டியில் உள்ள உறை பெட்டியில் (Freezer) வைப்பது.
இன்சுலின் எடுத்துக் கொள்வதற்கு மற்றவர்களை சார்ந்து இருப்பதைவிட சுயமாகவே எடுத்துக் கொள்வது நல்லது.	இன்சுலின் ஊசி போட கற்றுக்கொள்ளாமல் இருப்பது. மூன்று அல்லது நான்கு முறைக்கு மேல் சிரிஞ்சை உபயோகிப்பது.
சர்க்கரை நோயாளி என்னும் அடையாள சீட்டை வைத்திருத்தல். உடன் இருப்போருக்கும், உடன் பணிபுரிவோருக்கும் தன் சர்க்கரை நோய் பற்றித் தெரிவித்தல்	அடையாளச் சீட்டு இல்லாமல் செல்வது. எப்போதும் சிறிதளவு சர்க்கரை அல்லது 2-3 சாக்லேட் கைவசம் இல்லாமல் இருப்பது.
தாழ் சர்க்கரை நிலை வராமல் பார்த்துக் கொள்வது.	தாழ் சர்க்கரை நிலை பற்றி அறியாமல் இருப்பது.
இன்சுலின் பாட்டில் மிகவும் குளிர்ந்த நிலையில் இருக்கும் பொழுது, உள்ளங்கையில் வைத்து உருட்டவும்.	இன்சுலின் உள்ள பாட்டிலை குலுக்குவது.
தவறாமல் இரத்தப் பரிசோதனைச் செய்து சர்க்கரையின் அளவைக் கட்டுப்பாட்டில் வைத்திருத்தல்.	இரத்தப் பரிசோதனை செய்யாமலிருப்பது.

ஆ.பரிதா பானு M.Sc., (N) - இரண்டாமாண்டு
செவிலியர் முதுகலை பட்டமேற்படிப்பு, செவிலியர் கல்லூரி மற்றும் மருத்துவமனை, மதுரை மருத்துவக் கல்லூரி, மதுரை-20.

GUIDELINES FOR SELF ADMINISTRATION OF INSULIN

All the Persons dependent of Insulin and some others who may require Insulin can inject insulin easily and on their own. Insulin helps to protect our life and to prevent our body parts from being affected by diabetes.

Insulin is measuring in units. It is available in various intensities. The Insulin that are of common use are 40 units in one milli litre (U-40) and 100 units in one milli litre (U-100). Always the U-40 syringe alone be used for U-40 Insulin and U-100 syringe for U-100 Insulin.

PRELIMINARY PROCEDURES

Articles required for self administration of Insulin are Insulin Vial, Alcohol swab or cotton, spirit, Insulin injection.

To Check the date of drug, label of the Insulin vial and turbidity in insulin, as prescribed by the doctor

To note down the date of opening of Insulin vial

To keep the food ready

To wash the hands thoroughly

To Roll the Insulin vial gentlyl between the hands

GUIDELINES FOR FILLING UP OF INSULIN IN THE SYRINGE

- Clean the rubber portion at the top of the Insulin vial with Alcohol swab

- Hold the syringe like a pen and keep the vial on a flat surface
- Pull plunger down to let in air as equal to the amount of your Insulin dose

- Hold the Insulin vial straight and push the air from the syringe into the bottle

- Holding the Insulin vial upside down (it is necessary that the needle tip should be below the level of insulin) and pull the plunger down gently with your index finger and middle finger as per the requirement of your insulin.

- If air bubbles are present in the syringe, tap the syringe gently in order to remove the same.

NOW THE INSULIN SYRINGE S READY FOR SELF INJECTION

PROCEDURES FOR MIXING AND FILLING UP TWO TYPES OF INSULIN IN THE SYRINGE

- Wipe the rupper portion of the two insulin vials with Alcohol swabs.

- Draw air into the syringe equal to the dose of cloudy insulin.

- Hold the cloudy insulin vial straight, insert the needle therein and push air into the vial.

- Remove the syringe without drawing up the insuin.

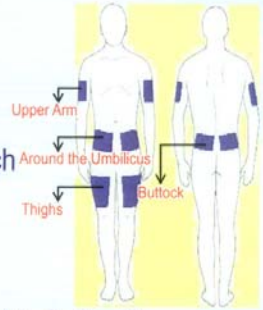
- Draw up air into the syringe to the dose of clear insulin required, and inect the same into the clear insulin vial.

- Then draw up clear insulin into the syringe and turn the cloudy insulin vial upside down to insert the needle into the vial so that the needle tip should be below the level of the insulin.

At first, the dlear insulin should be drawn into the syringe and then the cloudy insulin shall be drawn up. Now the syringe is ready for the self administration of insulin.

PARTS AT WHICH INSULIN SHOULD BE INJECTED

- The functioning of the insulin depends upon its place of its injection. Insulin injected in the abdomen area will be very effective.
- In abdomen, (it could be injected leaving a space of one inch surrounding the navel)
- Upper part of thigh and outer parts
- Upper part of the hand (it should be injected only with the aid of others)



PROCEDURE FOR SELF ADMINISTRATION OF INSULIN

- Though the place of injection insulin may vary, the procdures are common
- Selecting the part on which the needle should be injected.

- Wash the hands
- Clean with alcohol swab the area in which the insulin to be injected

- The area in which the injection is to be injected shall be pinched up with your thumb and middle and Index fingers.

- Then the medicine shall be injected at 90^0 as shown in the figure by pushing the plunger down.

- Before taking the needle out, count 1 to 5

- Release the syringe, placing alcohol swab in the area wherein insulin is injected.
- It is good not to rub hardly the place in which insulin was injected

- Take out the syringe and remove the needle

It is very much essential to change the area for injecting insulin, for the effective functioning of insulin and so that the injecting area does not turn hardened or swollen.

AFTER CARE

- To replace all the articles (insulin vials) in its own place.
- To wash the hands thoroughly
- To note down in diary the details pertaining to the injection of insulin
- Take food with in 1/2 hour after insulin injection.

THE GUIDELINES TO BE FOLLOWED AND AVOIDED WHILE TAKING INSULIN

TO BE FOLLOWED	TO BE AVOIDED
Insulin should be taken 1/2 hour prior to taking food or as prescribed by your doctor	To stop taking insulin without the advice of the doctor
Use the appropriate syringe Always use U-40 syringe for U-40 Insulin an U-100 syringe for U-100 Insuline	Using tip bent of blunt syringe
It is good to place the insulin at the side chambers of the refrigerator (or) Insulin shall be kept in a plastic bag, closed tightly and in a pot containing cold water	It is good to keep in the Freezer of the Refrigerator
It is good to take insulin by self instead of depending on others.	Not learning the procedures of injecting insulin. Using the syringe for three or four times.
To have the identification card as diabetic patient. To inform colleagues and co workers about his diabetic complaint	To travel without the identity card. Not always having little quantity of sugar or 2-3 chocolates in hand.
To take care that low sugar level is not reached	Not knowing about low sugar level
When the insulin vial is in extreme cool condition, roll it between the palm.	To shake the insulin vial
To have regular blood check up and maintaining the sugar level under control	Not undergoing blood check up

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