IOSR Journal of Applied Geology and Geophysics (IOSR-JAGG)
e-ISSN: 2321–0990, p-ISSN: 2321–0982.Volume 4, Issue 6 Ver. I (Nov. - Dec. 2016), PP 01-17
www.iosrjournals.org

"Feasibility of Nurse- Led Diabetes Clinic: A Pilot Study"

Mrs. Manju Joshi* Dr.UshaUkande.**

Problem Statement
"An exploratory study to assess feasibility of nurse led diabetes clinics in the selected hospitals and community health centers of Indore".

I. Introduction

It is currently estimated that 347 million people worldwide suffer from diabetes with more than 80% from low and middle income countries. In the past twenty years the global death rate from diabetes has doubled (Lancet). WHO is predicting that this will increase by two thirds by 2030.(WHO).

Global Morbidity and Mortality associated with Diabetes:According to International Diabetes Federation (IDF) Report 2009 it was around four million deaths in the age group of 20-79 years in 2010 accounting for 6.8% globally. IDF in 2006 reported >50 million diabetes people in South East Asia. (IDF 2009) (Indian express, Wed Nov 14 2012)

Diabetes in India:Diabetes has reached epidemic proportions worldwide. The World Health Organization (WHO) has commented there is 'an apparent epidemic of diabetes which is strongly related to lifestyle and economic change'. India leads the world with largest number of diabetic subjects earning the dubious distinction of being termed the "diabetes capital of the world". According to the Diabetes Atlas 2006 published by the International Diabetes Federation, the number of people with diabetes in India is currently around 40.9 million which is expected to rise to 69.9 million by 2025 unless urgent preventive steps are taken. (Mohan V, 2007). Anestimation for Type 2 diabetes was around 51 million in 2010 which is projected to rise to 87 million in 2030. The prevalence of type2 diabetes in urban Indian adults has increased from less than 2.5% in 1970 to about 18.6% in 2008. On the basis of recent surveys, ICMR estimates the prevalence of diabetes in adults to be 3•8% in rural areas and 11•8% in urban areas. (Dr.Mohan, November-2010).Diabetes Morbidity and Mortality in India (Vipin Gupta South Asia Network for Chronic Disease, New Delhi).Diabetes responsible for 109 thousand deaths in 2004 and 1.157 million years of life lost in 2004 (Venkataraman et al. 2009) and 2.263 million disability adjusted life years (DALYs) in India during 2004 (ICMR 2006).

Various studies done regarding the importance of diabetes clinic: A study from Denmark suggests that General Practitioner practices with nurse-led diabetes clinics help patients achieve significantly better blood sugar control than those without nurse-led care. Researchers examined data from 193 GP practices and nearly 13,000 patients with type 2 diabetes aged between 40 and 80 years old. They also assessed the nurse-led care provided at their practice and the patients HbA1c (haemoglobinA1c) levels. Three out of four of the GP had a practice nurse, and of these, 61 per cent provided individual consultations with the nurse for diabetic patients. The authors concluded that involving nurses in type 2 diabetes care is associated with improved quality of diabetes management." (Times of India, September 13, 2012)Non-communicable diseases were estimated to account for 35 million (60%) of the 58 million deaths globally in 2005. Of these, 72% were estimated to have occurred in low and lower middle income countries. In India, 53% of all deaths in 2005 were estimated to be due to non-communicable diseases. Non-communicable diseases pose a different and more complex threat to the health systems of countries, already faced with the unfinished agenda of infectious diseases, and maternal and child health problems. The hallmarks of these diseases namely long latency, chronicity, multi-organ involvement and need for long-term care make the management of chronic conditions difficult.

India: In India, limited studies have focused on diabetes care and provide an insight into the current profile of patients and their management. In another pan-India study with patients recruited through providers, 70% of the patients were diagnosed by general practitioners. Only 43.4% patients had their BP checked at the time of diagnosis. Both studies cannot, however, be considered representative of diabetes patients in India due the lack of a defined population base and rigorous sampling.

Nagpal et al., in a study among urban diabetics from middle and high income groups in Delhi, found that 41.8% of those tested had HbA1c greater than 8%, 63.2% had uncontrolled hypertension, and 74.5% had abnormal lipid profile. 79.4% were compliant with their medication, though 41.4% had not visited their health care provider in the past year.

Diabetes responsible for 109 thousand deaths in 2004 and 1.157 million years of life lost in 2004 (Venkataraman et al. 2009) and 2.263 million disability adjusted life years (DALYs) in India during 2004 (ICMR 2006).

Diabetes in Madhya Pradesh—According to M.P. fact sheet 2011—2012 total no of diagnosed case of diabetes type2 is 478per 100,000 population.

Diabetes in Indore dist. Total diagnosed cases are 920 per 100,000 populations (M.P. fact sheet 2011-2012.)

No literature on Nurse Led Diabetes clinic is available in India that is the felt need, which motivated the Investigator for present study. Involving nurses in type 2 diabetes care is associated with improved quality of diabetes management." (Times of India, September 13, 2012) Thus, with this increase in the prevalence of diabetes a nurse plays an important role in caring a diabetic patient covering all the aspects of care emphasizing on prevention of complications and paying special concern to the patients need.

Background: A well-structured, comprehensive, multilayered and multifaceted approach to patients with chronic disease was shown to be able to improve patients' clinical outcome [24]. The annual review of DM patients was recommended for universal use in the European St Vincent Declaration in 1990 [25]. Different kinds of structured primary care programs for type 2 diabetes mellitus (DM) patients that targeted at improving cardiovascular risk factors as well as glycemic monitoring and control have been launched in United Kingdom, [26] Australia [8] and New Zealand [27]. Previous studies have shown that the addition of a nurse who plays the role of providing patients with education interventions can lead to improvements in patient outcomes as well as the process of care [28,29]. Since August 2009, the public GOPCs in Hong Kong introduced an assessment and interventional multidisciplinary DM care program in primary care setting [30]. Nurses were trained to be case managers. They annually assessed patients' cardiovascular risk factors and monitored the conduct of complication screening including retinopathy assessment, assessment of the presence of micro albuminuria, peripheral vascular disease and neuropathy. All data was recorded on the Computer Management System. The nurses also provided interventions including the education of patients on proper drug use, self-blood glucose monitoring and the management of hyperglycemia and hypoglycemia. They could also refer patients to dietitians, physiotherapist, mental health service, podiatrist, occupational therapist and ophthalmologist according to a standardized management protocol. The program was shown to improve glycemic control and reduce cardiovascular risk for the participants at 12 months follow-up [31]. The multidisciplinary approach seemed to be particularly important for the elderly due to their elevated risk for diabetes complications and other comorbidities such as depression, cognitive impairment, chronic pain, visual impairment and polypharmacy [32]. Despite positive results from these programs, there were reports of non-attendance to various diabetes clinics [33-34]. Moreover, patients who failed to attend these diabetes clinic tended to have significantly more risk factors and complications than those who keep their appointment [35].

II. Need Of The Study

The literature review shows that there is a huge burden of this disease and already the health services are aware of it. By the development of NLDC they will come to see the proper care and guidance to diabetic patients which will help in further development of clinics in various states where really the number of Diabetic patients is increasing sarcastically.

It is found that doctors do not take burden in putting emphasis or explaining the disease prevention part in detail. Therefore, people remain unknown about the facts and strategies to prevent further complications.Lack of time is a considerable barrier, preventing doctors from providing sufficient information to their patients and blocking their ability to share decisions in practice. (Kaplan SH, Med Care 1176-87.[PubMed])

Addressing the gaps is essential as the ultimate sufferer is the patient itself. According to American Association of Clinical Endocrinologist Nurse educators are the backbone of multidisciplinary diabetes care team and are greatly appreciated by patients and families.We are concerned with the community and therefore it becomes a prime responsibility of the health care persons to take an initiative in assessing and managing the people with diabetes.

Though India is progressing in every field but still we are lacking behind the other countries. We need participation of the patients in caring for themselves, to know their health status and to work out in case of any complications. And this is all done when the patients are adequately supplied with the knowledge of managing the disease and prevention of complication. The policy makers therefore can take an initiative in forming these NLDC where people can get proper care and guidance in treating their disease. We will come to know thepossibilities of having nurse led clinics in the hospital and community settings and also to know the feasibility of nurse led clinics in India in Government, Private sectors and as an entrepreneurship for nurses.

Research Question---: "Is It Feasible To Establish Nurse Led Diabetes Cli Enic In The Hospital And Community"?

Problem Statement

"An exploratory study to assess feasibility of nurse led diabetes clinics in the selected hospitals and community health centers of Indore".

Objectives Of The Study

The primary objectives of the study

To explore the possibilities of setting up a Nurse Led Diabetes Clinic (NLDC) in the hospitals and communities of Indore through opinionnaire of stakeholders (patients, Doctors and Nurses).

The secondary objectives of the study

1. To assess the attitude of health care professionals (Doctors Nurses, dietitians & Diabetes educators) and People with Diabetes regarding diabetes management.
2. To assess the common health problems of people with diabetes.

Hypotheses

H01= There is no supportive attitude of stake holders towards NLDC in the hospitals and communities of Indore.

H02= There is no significant association between demographic variables and attitude of stakeholders

H03= There is no significant difference between opinion among stakeholders.

Variables Of The Study

Independent Variable – Perception of stake holders (patients, Doctors and Nurses) and people with Diabetes.
Dependent Variable – Feasibility of NLDC.

Operational Definitions

- Feasibility – In this study feasibility means is there a need of Nurse Led Diabetes Clinic (NLDC) in hospitals and communities that will be assessed by perception of doctors, nurses, dietitians and people with diabetes.
- NLDC – Nurse Led Diabetes Clinic in this study means a clinic run by a well trained nurse in collaboration with Diabetologists, dietitians, ophthalmologists, neurologists and physiotherapists to render a comprehensive, holistic & cost effective care to diabetes patients.

Ethical and legal consideration

Investigator has obtained the ethical permission from the ethical committee of the Institution.

Inclusion criteria

1.Diagnosed cases of Diabetes mellitus
2. People with diabetes attending to hospitals or clinics of Diabetologists .
3. Patents who are suffering from diabetes since last 5 years.

Exclusion Criteria

1. Complicated Diabetes patients unable to respond.
2. Health care professionals having less than 5 years' experience.

Proposed Methodology Of The Research Work

- Research Approach: A Mixed method research approach will be used in the study.
- Research design: Sequential explorative research design is adopted for the study.
- Setting: The study will be conducted in urban and rural areas of Indore district of Madhya Pradesh covering 4 Government Hospital, 4 Private Hospitals, 4 CHCs and 4 PHCs.

Sample Categories are:

- General practitioners/Endocrinologist
- Staff Nurses/Nurse Educators
- Diabetic Educators
- Dietitians
- Patients with Diabetes Mellitus

Sample size

Sample size calculated using power analysis.

Total sample size for the study will be 300. 100 samples for qualitative study and 200 for quantitative study 40 samples from each category mentioned above shall be taken for study.

Research Tool

The research tools have been categorized under two sections, i.e. Section A and Section B. The details of the sections are as follows:

Section A

This section includes socio-demographic data of

1. Doctors,
2. Nurses,
3. Dietitian,
4. Diabetes Educator and
5. People With Diabetes.

Section B

This section consists of:

i) Tool to collect qualitative data
ii) Tool to collect quantitative data

Section C

(i) **Tool To Collect Qualitative Data (Self structured questonnnaire)**

a. Opinionnaire for Doctors (GPS/ Dialectologists) on feasibility of nurse led diabetes clinic.
b. Opinionnaire for nurses regarding feasibility of nurse led diabetes clinic.
c. Opinionnaire for dietitian regarding feasibility of nurse led diabetes clinic
d. Opinionnaire for dietitian regarding feasibility of nurse led diabetes clinic
e. Opinionnaire for people with diabetes to assess their views regarding feasibility of nurse led diabetes clinic.

ii) Tool to collect quantitative data.

a.Assessment of prevalence of diabetes through cross-sectional descriptive epidemiological method.

b.Assessment of diabetes attitude of Health Care Professionals(HCP)(Doctors, Nurses, Dietitian, Diabetes educators) and PWD using DAS-3 standardized tool developed by University of Michigan Diabetes Research and Training Center

c.Omaha System for self-report of symptoms by people with diabetes (for people with diabetes) it will be a guide line in preparation of training module.

Organization And Presentation Of Data

SECTION 1: Frequency and percentage distribution of socio demographic variables of all samplecategories.
SECTION 2: Qualitative data analysis of verbatim.
SECTION 3: Assessment of Attitude of health care professionals and PWD towards diabetes management.
SECTION 4: Assessment of Self Report of Symptoms by people with Diabetes .

Section --1

Characteristics of the study population

Table - 1 Demographic characteristicsof Doctors (N=5)

S.No.	VARIABLES	FREQUENCY	PERCENTAGE
1.	Age in years		
	a) 30 - 40	--	---
	b) 41 -50	**3**	60%
	c) 51 - 60	**1**	20%
	d) Above 60	**1**	20%
		--	--
2.	**Designation**		
	a) Medical officer	3	60%
	b) Practitioner	2	40%
	c) Both	-	
3.	**Gender**		
	a) Male	5	100%
	b) Female	--	
4.	**Professional qualification**		
	a) MBBS	2	40%
	b)MD	2	40%
	c)OTHERS	1	20%
		--	
5.	**Years of experience**		
	a)< 10	2	40%
	b) 10 - 15	2	40%

	c) 15- 20 d)> 20	- 1	-- 20%
6.	**Types of job** a)Government b) Private c) Self employed	 1 2 2	 20% 40% 40%

Table 1.shows Demographic characteristics of Doctors - Age --60%(3) belongs to to3o-40yrs of age, 20%(1) 41-50 years , 20%(1) 51—60yrs, Professional qualification- 40%(2) are MD, 40%(2) MBBS and 20%(1) is other's . Designation-- 40% (2) practitioner and 60%(3) are employed in the post of Medical Oficer.- Gender--100%(5) samples male ,Experience--- 20%(1) 51 – 60 years age group. 40% (2) having less than 10% experience, 40% having 10- 15yrs. experience, and 20% (1) have more than 20yrs.Type of job 20%(1)in govt. job, 40%(2) in private job,40%(2) self-employed.

Table -2: Demographic characteristicsof Nurses N=5

S.No.	VARIABLES	FREQUENCY	PERCENTAGE
1.	Age in years a) 20-25 b) 26- 30 c) 30- 35 d)>35	 3 2 - -	 60% 40% -- --
2.	Gender a) Male b) Female	 1 4	 20% 80%
3.	Professional qualification a) B.Sc. Nursing b) Post Basic BSc Nursing c) GNM	 3 - 2	 60% -- 40%
4.	Type of occupation a) Govt. Job b) Private job	 1 4	 20% 80%
5.	Income per month a) 10,000 b) 10,001 – 15,000 c) 15,001 – 20,000 Above 20,000.	 1 3 1 --	 20% 60% 20%
6.	Experience of diabetes patient care a) 1year b) 2years c) 3years d)> 3years	 2 2 1	 40% 40% 20%

Table 2 showsDemographic characteristics of Nurses –Age-- 60%(3) belongs to to25 - -30yrs of age, 40%(2) 31-35 years , Gender- 80%(4) are ,female 20%(1) male, Professional qualification-- 60%(3) is B.Sc. Nursing &40%(2) post basic B.Sc. Nursing. Type of occupation-- 80% (4) are from private job and 20% (1) from govt. job. Income per month 60%(3) of nurses belongs to income group Rs10,000 –Rs 15.000 /month.20%(1) hang inomeRs.19,000/month,20% (1)havingRs. 15,001-20,000/month income .Experience of diabetes care 40%(2) nurses having 1year ,40% ((2) having 2years experience and 20%(1) having 3 years of experience.

Table 3: Socio-demographic Data of Dietitian N=5

S.No	VARIABLES	FREQUENCY	PERCENTAGE
1.	Age in years a) 25 - 30 b) 31 - 35 c) 36 & above	 5 - -	 100% - --
2.	Gender a) Male b) Female	 - 5	 100%
3.	Professional qualification a) Diploma b) post graduate	 4 1	 80% 20%
4.	Type of occupation a) Government b) Private c) Self employed	 1 4	 20% 80%
5.	Income per month (in Rs.) a) 10,000 -15,000 b) 15,000 – 20,000	 1 3	 20% 60%

	c) 20,000 – 25,000 d)> 25,000	1 --	20% -

Table3.shows the demographic characteristics of Dietitians. 100% (5) belongs to age group of 25 – 30years. 100%(5) Dietitians are female, 80%(4) are in private job and 20%(1) in govt. job.60%(3) having monthly income Rs.15,000 – Rs.20,000.20%(1) having monthly income Rs. 10,000 – 15,000 & rest 20%(1) having monthly income Rs.20,000 – 25,000

Table 4: Demographic Data of Diabetes Educators (IDF) N=5

S.No.	VARIABLES	FREQUENCY	PERCENTAGE
1.	**Age in years** a) 25- 30 b) 31-35 c) 36 -40	 3 2 --	 60% 40% --
2.	**Gender** a) Male b) Female	 1 4	 20% 80%
3.	**Type of occupation** a) Government b) Private c) Self employed	 1 4 -	 20% 80%
4.	Income per month (Rs) a) 10,000 – 15,000 b) 15,000 – 20,000 c) 20,000—25,000 d)> 25,000	 1 2 1 1	 20% 40% 20%
5.	**Any health professional licensure** a) yes b) No	 3 2	 60% 40%

Table 4.shows the demographic characteristics ofDiabetes Educators (IDF) .60%(3) 0f sample belongs to 25-30 years.40%(2) belongs to31 – 35 years age group. 80% (4) are female & 20% (1) male. 80%(4) working in private sector and 20% (1) working in government.40 % (2)having monthly income Rs. 15,000 –Rs. 20, 000. 60%(3) dietitians having professional licensure, 40% are not having professional licensure.

Table 5: Socio-demographic Data of People with Diabetes N=5

S.No.	VARIABLES	FREQUENCY	PERCENTAGE
1.	**Age in years** **a) 20- 30** **b) 31 – 40** **c) 41 - 50** **d) Above 50**	 **1** **1** **2** **1**	 **20%** **20%** **40%** **20%**
2.	**Gender** **a) Male** **b) Female**	 **3** **2**	 **60%** **40%**
3.	**Literacy** **a) not gone to school** **b) primary** **c) Secondary** **d) Graduate & above**	 **1** **1** **2** **1**	 **20%** **20%** **40%** **20%**
4.	**Religion** **a) Hindu** **b) Muslim** **c) Christian** **d) others**	 **4** **1** **-** **-**	 **80%** **20%**
5.	**Occupation** **a)Job** **b) Business** **c) Farming** **d) Home maker**	 **2** **2** **1** **--**	 **40%** **40%** **20%**
6.	**Type of work** **a) Laborious** **b) Sedentary**	 **2** **3**	 **40%** **60%**
7.	**Income per month(Rs.)** **a)10,000-15,000** **b) 15,000 – 20,000** **c) 20,000 – 25,000** **d)> 25,000**	 **3** **1** **-** **1**	 **60%** **20%** **-** **20%**
8..	**Marital status** **a) Married**	 **4**	 **80%**

	b) Un-married	--	-
	c) Divorce/widowers	**1**	**20%**
9.	**Number of children**		
	a) 1		--
	b) 2	**1**	**20%**
	c) 3	**3**	**60%**
	d) 4	**1**	**20%**
10.	**Type of family**		
	a)Nuclear	**2**	**40%**
	b) Joint	**3**	**60%**
11.	**Type of residential area**		
	a) Rural	**3**	**60%**
	b)Urban	**2**	**40%**
12.	**Dietary habit**		
	a) Vegetarian	**4**	**80%**
	b) Non vegetarian	**1**	**20%**
13.	**Height (in Ft.)**	--	
	a) 3-4	1	--
	b) 4 [	4	**20%**
	c) 5	**-**	**80%**
	d)>5		--
14.	**Weight (in kg)**		
	a)35 -40	--	---
	b) 41-45	--	---
	c) 46 -50	**2**	**40%**
	d)>50	**3**	**60%**
15.	**waist –Hip ratio**		
	a) 0.80	---	---
	b) 0.80 -0.95	---	---
	c) 0.96 - 1	**4**	**80%**
	d) 1.0+	**1**	**20%**
16.	**BMI (kg/m^2)**		
	a) 18.5		
	b) 18.5 –22.9		
	c) 23 –23.9		
	d) 25 and greater		
17.	**Age when diagnosed (in years)**		
	a) 20 - 25		
	b) 25 - 30	**1**	**20%**
	c) 30 - 35	**2**	**40%**
	d) 35 - 40	**1**	**20%**
	e)> 40	**1**	**20%**
		-	**-**
18	**Any co-morbid condition**		
	a) High blood pressure		
	b) Kidney disease	**5**	**100%**
	c) Eye problem		
	d) Neurological problem	**1**	**20%**
		1	**20%**
		2	**40%**

Table 5.shows the demographic characteristics of People With Diabetes (PWD)---Majority 40%(2)from the age group of 41-50 years , 20%(1)from eachi,e. 20-30yrs, 31-40yrs, and above 50 yrs. 60%(3) male 40%(2) female, Literacy wise majority 40%(2) secondary education, 20%(1) from each group that is never gone to school, primary,graduate and above. Religion – 80%(4)are Hindu and 20%(1) is Muslim. Occupation –40% (2) in Job, 40% (2) doing business, 20% (1) Farming. Type of work 60%(3) having sedentary work and 40% (2) doing laborious work. Monthly income 60%(3) having Rs.10,000 –Rs.15,000 income.20%(1) form Rs. 15,000 – 20,000 and >Rs.25000 each. Marital status—80%(4) are married 20%(1) is widower. . Number of children 60%(3) having 3 children, 20%(1), having 1 child and 20%(1) , having 4 children. Type of family: 60%(3) from joint family and 40%(2)from nuclear family. Residential area: 6o% (3) from rural area and 40%(2) from urban area. Dietary habits 80%(4) vegetarian and 20%(1)is non-vegetarian. Height 80%(4) >5ft and 20%(1) 5ft. Weight –60%(3) >50 Kg.,40%(2) 45-50Kg.Waist Hip ratio 80%(4) ratio is 0.96-1.20%(1) 1.0+.BMI 60%(3) 25 and greater, 40%(2) 46—50. Age when diagnosed 80%(4) diagnosed at the age of 35 – 40 years,20%(1) diagnosed at30-35 years. Co- morbid conditions 100% (1) having hypertension,20%(1) kidney disease, 20%(1) eye problem,40%(2) having Neurological problem

Section 11
Qualitative Data Analysis.
T1.Opinion OF Health Care Professionals (HCP) (Doctors, Nurses, Dietitians, Diabetes Educators) And Pwd

S.No.	STATEMENT OF QUESTION	Opinion of Doctors	Opinion of Nurses	Opinion of dietitians	Opinion of Diabetes educators	Opinion of PWD
	Questionnaire common to all. --- 1.Will you please explain your views regarding feasibility of NLDC (nurse led diabetes clinic).	Feasibility is difficult to say in India. Nurses need more training to manage diabetes patient.	Yes, we will be very happy towork in a NLDC. Special training is needed, for independent management.	Yes nurses can run a NLDC, as they are already managing patients in the hospital	Definitely it is feasible to run a clinic by a nurse. In many countries nurses independe ntly running Diabetes clinic	We have no experience of diabetes clinic run by a nurse. But asyou explained it may be very helpful for people who cannot visit a doctor regularly.
	2. What is your opinion if a nurse does the follow up care and conduct Life style training for PWD in collaboration with treating doctor will it improve the compliance of patients to regular treatment and glycemic control.	Yes, by individual attention and regular life style training, glycemic control will be there. But in India nurses are not legally permitted for such clinic.	Yes. NLDC will help to control blood sugar level to normal, if nurses given the authority to run a clinic.	Regular life style training and treatment by a trained nurse will definitely maintain glycemic level of diabetes patients.	Nurses can help the patient in regular treatment and life style modificatio n, which will ultimately keep glycemic control.	ThroughNLDC it may be possible to control glycemic level but we have no experience.
	3. 2What do you think are the barriers or challenge for people with diabetes (PWD) to adhere to treatment.	Lack of knowledge of disease, financial burden, lack of family support are barriers.	Complex management of diabetes ,changing diet pattern , financial Barrier.			
	Opinionnaireof the Doctors. 3 please give your opinion regarding treatment and follow up compliance of patients with diabetes. --- 4Are there drop out of patients? Please explain for drop out.	Most of the patients, come for follow up regularly. 1-2% diabetes patients are irregular. As such there is no drop out.				
	Questionnaire for nurses					
	Do you feel nurse need special training in diabetes,and its management?	.	Yes nurses need training in Diabetes management			
	Opinionnaire for dietitians					
	2What do you think are the barriers or challenge for people with diabetes (PWD) to adhere with the changing dietary pattern of diabetic diet.			Main barrier is, adapting with modified diet plan. Usually people are not serious about it.		
	Opinionnaire for Diabetic educator					
	2.What do you think are the barriers or challenge for people with diabetes (PWD) to adhere?				Changing life style, and	

					life-long treatment is the challenge for PWD to adhere.	
	Opinion of PWD **----------** **If a nurse does the follow up care and conduct life style training for PWD will it improve the compliance of patients to adhere to the new dietary pattern and self-management of their problem.**					**We have no experience of NLDC.**
	2.How soon were you seen by physician in relation toyour appointment time.					**Usually 1hour we need to**
	3.Did you receive adequate information and educationabout your diabetes.					**Yes we do get the information ,if doctor is free. Usually doctors are very busy.**
	4.Did you have the opportunity to discuss your condition with your doctor.					**yes ,sometime we get.**
	5.If a nurse run a clinic where you can approach for your every problem the follow up care, life style training &training for self management of diabetes, what is your opinion about it.					**I Never visited an independent nurse clinic. As you said about NLDC ,that it will be easily approachable by PWD ,will provide all information needed by PWD and their family members. If it is so then clinic will a great help for us".(Participant 4)**

2.2 Emerged Categories And Themes

The various subthemes (categories)developed were:

- **I know nurses running special clinics .**
- **NLDC difficult in India**
- **Nurses are not prepared .**
- **Nurses need training**
- **Will be very happy to run a clinic.**
- **Nurses can manage a diabetes clinic**
- **Nurses already manage the hospital ward as in charge.**
- **Legally nurses are not permitted.**
- **Devote more time for patients**
- **Policy makers can think about it.**
- **It should be a team work**
- **Difficult to change the life style**
- **Eating is individual choice.**
- **Eating habit change is frustrating.**
- **Our ancestor had same diet pattern what we follow.**
- **No idea of NLDC.**
- **Never visited a independent nurse clinic**
- **Nurses give health education in the hospital &community.**
- **Family support is essential**
- **Regular visit to hospital find difficult.**
- **Clinic near residence will be helpful.**
- **There is few dropout.**
- **Cause of drop out may be different.**
- **Diabetes management is expensive.**
- **Can't manage injection insulin at home.**
- **Patient should be educated .**
- **Continuous regular education needed.**
- **Motivation is needed**

- **Family or care taker need education &training**
- **Fatigue is a problem in self management.**

During data analysis five themes have been emerged. They are--

1. **It is feasible to run NLDC by giving special training to nurses regarding diabetes**
2. **Nurses are not allowed legally in India to practice.**
3. **Not aware of NLDC.**
4. **Barriers in self-management of diabetes.**
5. **Doctors are busy .**

Description of the individual themes:

1.It is feasible to run NLDC by giving special training to nurses regarding diabetes.

Doctors opinion

"yes it is feasible to run a NLDC , but nurses need special training of diabetes management."(participant -1)

Nurses are not prepared ,as we see they need more training and experience of diabetes management."(**Participant 3)**

*As we see nurses working in hospitals they manage patients in one assigned area skillfully I feel nurses can manage aclinic.(***Participant 5)(dietitian)**

2. Nurses are not allowed to practice. legally in India

"There are clinics run by nurses in many countries in India it is not legally permitted"(participant 4)

One of the doctors said "*Legally Nurses are not allowed to run a clinic. they should approach policy makers. (Participant 2)*

" In India nurses have no authority to prescribe treatment and manage patients independently".(Participant -5) (Nurse)

3 . Not aware of NLDC - All-Patients were not aware of NLDC.

"I never heard about any clinic run by a nurse. So I don't know how much it is beneficial for diabetes patients" (participant 1—5 (patients.)

" *I Never visited an independent nurse clinic. As you said about NLDC ,that it will be easily approachable by PWD ,will provide all information needed by PWD and their family members. If it is so then clinic will a great help for us".(***Participant 4)**

4.Barriers in self-management of diabetes. Doctors ,

Nurse's, Deititian's, and Patient's opinion included various barriers, like—Social barrier, personal barrier, financial barrier, dietary barrier ect.

" It is very difficult for me to eat diabetic diet, I can't afford treatment, my son is the only earning member for whole family, It is difficult to manage." (Participant –3).

5.Doctors are busy----"Always we can't discuss problems with doctors , whenever they have time we talk about our problems" (Participant –5).

Pilot study reveals that most of the Doctors, Nurses, Dietitian's opinion regarding feasibility of NLDC was favorable .

Quantitative Data Analysis --

ii) Tool to collect quantitative data

a) Diabetes Attitude Survey for health care professionals

a) The tool used for this is --Diabetes Attitude Scale 3 (DAS3) (Revised new version).An standardized tool by Michigan Diabetes Research and Training Center, Department of Postgraduate Medicine/HealthProfessionEducation,USA.

Total sample – 25 (5 from each category)

Comparison several means

Is there is a difference in the means satisfactory level among the five groups?

H_0:$\sigma_1^2 = \sigma_2^2$

The descriptive table (see below) provides some very useful descriptive statistics, including the mean, standard deviation and 95% confidence intervals for the dependent variable (scores) for each separate group (Doctors Nurses, dietitians & Diabetes educators), as well as when all groups are combined (Total).

Table 6

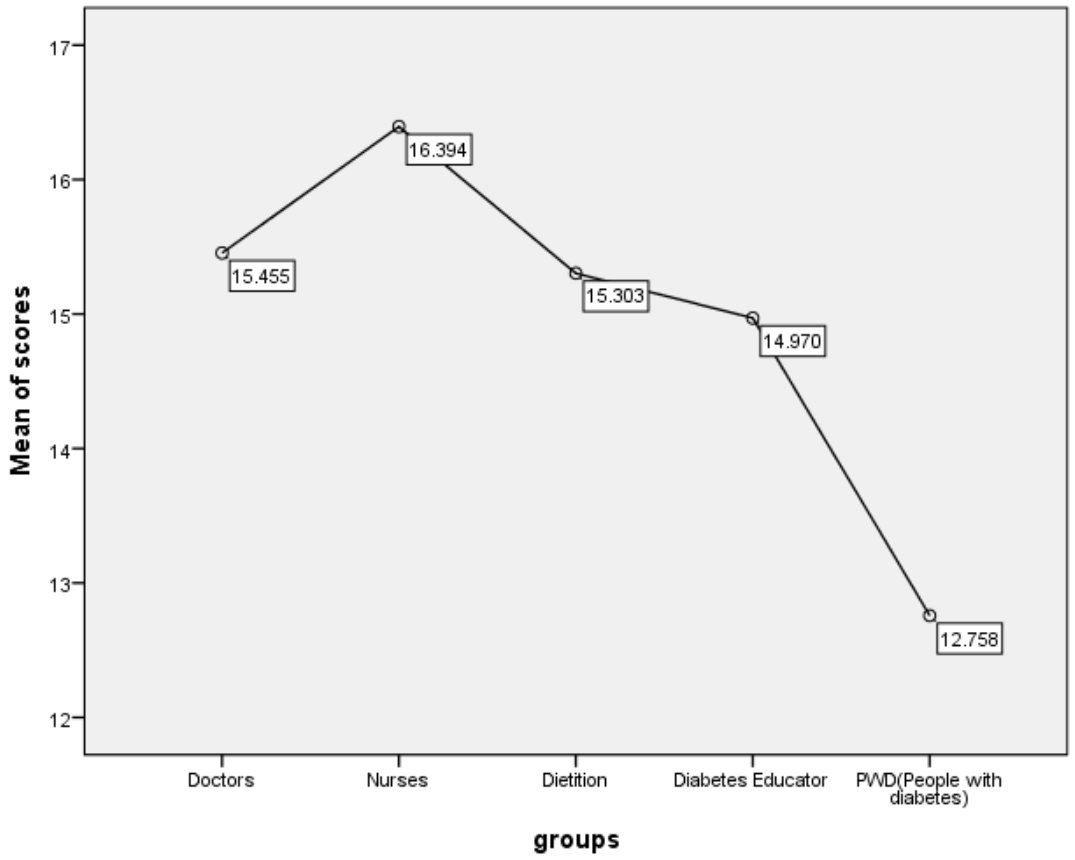
Descriptive statistics								
Scores								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Doctors	33	15.45	5.087	.886	13.65	17.26	8	25
Nurses	33	16.39	5.172	.900	14.56	18.23	6	23
Dietitian	33	15.30	3.459	.602	14.08	16.53	11	22
Diabetes Educator	33	14.97	3.504	.610	13.73	16.21	9	23
PWD(People with diabetes)	33	12.76	3.742	.651	11.43	14.08	7	21
Total	165	14.98	4.381	.341	14.30	15.65	6	25

The p value of 0.02 is less than the alpha significance level 0.05 so the null hypothesis is rejected.
Table7

Test of Homogeneity of Variances			
Scores			
Levene Statistic	df1	df2	Sig.
2.835	4	160	.026

This is the table that shows the output of the ANOVA analysis and whether we have a statistically significant difference between our group means. We can see that the significance level is 0.013 (p = .013), which is below 0.05. and,therefore, there is a statisticallysignificant difference in the scores of diabetes Attitude Survey for health care professionals includes 33 statements.

ANOVA					
Scores					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	239.842	4	59.961	3.299	.013
Within Groups	2908.061	160	18.175		
Total	3147.903	164			



Conclusion: The population means are not all equal. The mean scores are not same for the (Doctors,Nurses, dietitians & Diabetes educators), at this point we can only conclude there is a difference in the group means. we cannot determine which treatment group differ or how many treatment group differ. This is great to know, but we do not know which of the specific groups differed. Luckily, we can find this out in the **Multiple Comparisons** table which contains the results of post-hoc tests.

Multiple Comparisons

groups		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Doctors	Nurses	-0.939	1.05	0.372	-3.01	1.13
	Dietitian	0.152	1.05	0.885	-1.92	2.22
	Diabetes Educator	0.485	1.05	0.645	-1.59	2.56
	PWD(People with diabetes)	2.697*	1.05	0.011*.	0.62	4.77
Nurses	Doctors	0.939	1.05	0.372	-1.13	3.01
	Dietitian	1.091	1.05	0.3	-0.98	3.16
	Diabetes Educator	1.424	1.05	0.177	-0.65	3.5
	PWD(People with diabetes)	3.636*	1.05	0.001*.	1.56	5.71
Dietitian	Doctors	-0.152	1.05	0.885	-2.22	1.92
	Nurses	-1.091	1.05	0.3	-3.16	0.98
	Diabetes Educator	0.333	1.05	0.751	-1.74	2.41
	PWD(People with diabetes)	2.545*	1.05	0.016*.	0.47	4.62
Diabetes Educator	Doctors	-0.485	1.05	0.645	-2.56	1.59
	Nurses	-1.424	1.05	0.177	-3.5	0.65
	Dietitian	-0.333	1.05	0.751	-2.41	1.74
	PWD(People with diabetes)	2.212*	1.05	0.037*.	0.14	4.28
PWD(People with diabetes)	Doctors	-2.697*	1.05	0.011*.	-4.77	-0.62
	Nurses	-3.636*	1.05	0.001*.	-5.71	-1.56
	Dietitian	-2.545*	1.05	0.016*.	-4.62	-0.47
	Diabetes Educator	-2.212*	1.05	0.037*.	-4.28	-0.14

*. The mean difference is significant at the .05 level.

The Tukey post-hoc test is generally the preferred test for conducting post-hoc tests on a one-way ANOVA, but there are many others. We can see from the table below that there is a significant difference of score between the group that took the doctors and the PWD ($p = 0.06$), as well as between the other groups.However, diabetes educator and others there were no significance differences between the groups i.e. the P value is above 0.05 in all groups.

We can see from the table that we have a "**Sig.**" value of $p < .0005$. Therefore, we can conclude that PWD was significantly dependent on doctors ($p < .0005$

Section B

1. **To assess the attitude of health care professionals (Doctors, Nurses, dietitians & Diabetes educators) and People with Diabetes regarding diabetes management.(Domain wise)**

Descriptive statistics comparison for Subscale -1 (Need for special training) in all groups

		Minimum	Maximum	Range	Mean	Median	Mode	Standard Deviation	Variance
groups	Doctors	9	24	15	16	17	9	6	41
	Nurses	7	23	16	19	20	19	5	26
	Dietitian	11	22	11	17	17	11	4	16
	Diabetes Educator	10	20	10	16	16	18	4	14
	PWD(People with diabetes)	7	16	9	13	13	11	3	11

Descriptive statistics comparison for Subscale -2 (seriousness of NIDDM) in all groups

		scores							
		Minimum	Maximum	Range	Mean	Median	Mode	Standard Deviation	Variance
groups	Doctors	8	21	13	14	14	10	5	29
	Nurses	6	23	17	14	14	6	7	43
	Dietitian	11	18	7	15	15	11	3	9
	Diabetes Educator	12	17	5	15	16	16	2	4
	PWD(People with diabetes)	9	19	10	12	11	9	4	17

Descriptive statistics comparison for Subscale -3 (value of tight control) in all groups

		scores							
		Minimum	Maximum	Range	Mean	Median	Mode	Standard Deviation	Variance
groups	Doctors	9	21	12	16	14	14	5	22
	Nurses	10	21	11	16	16	16	3	11
	Dietitian	11	19	8	14	15	11	3	11
	Diabetes Educator	9	17	8	14	15	17	3	9
	PWD(People with diabetes)	9	16	7	11	11	9	2	6

Descriptive statistics comparison for Subscale -4 (psychosocial impact) in all groups

		scores							
		Minimum	Maximum	Range	Mean	Median	Mode	Standard Deviation	Variance
groups	Doctors	10	25	15	18	17	21	5	27
	Nurses	9	23	14	18	18	18	5	23
	Dietitian	11	22	11	16	15	13	4	15
	Diabetes Educator	9	23	14	15	16	16	5	24
	PWD(People with diabetes)	9	21	12	14	12	9	5	27

Descriptive statistics comparison for Subscale -5 (Patient autonomy) in all groups

		score							
		Minimum	Maximum	Range	Mean	Median	Mode	Standard Deviation	Variance
groups	Doctors	9	17	8	12	11	9	4	12
	Nurses	7	22	15	16	17	7	5	28
	Dietitian	11	15	4	13	13	11	2	3
	Diabetes Educator	10	19	9	13	13	10	3	10
	PWD(People with diabetes)	7	11	4	10	11	11	2	2

Assessment of Attitude of health care professionals and PWD in Domains

Descriptive Statistics of groups according to all subscales

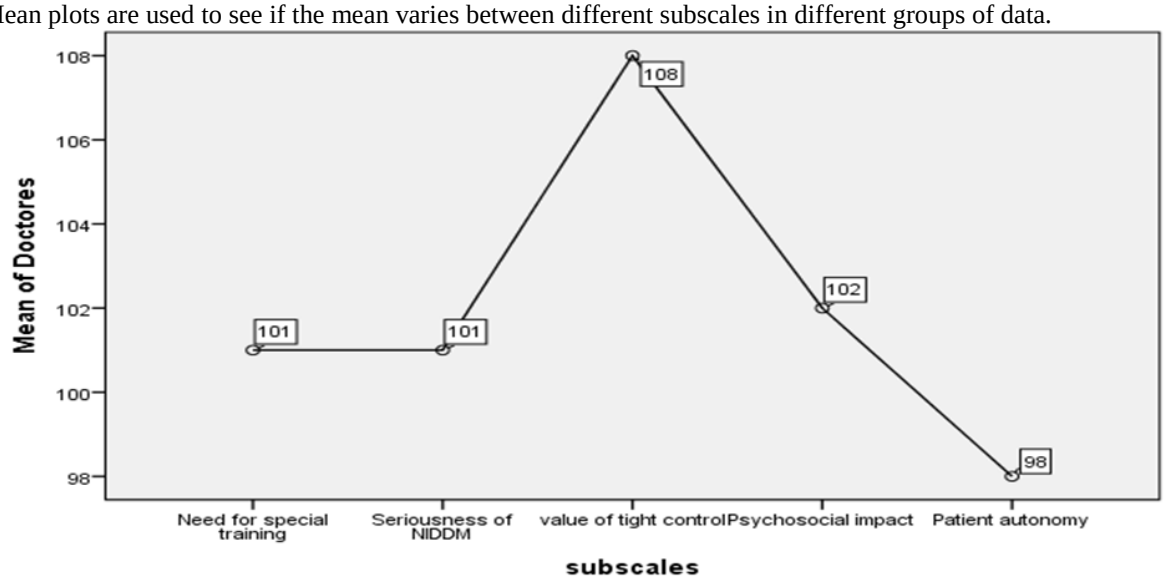
Descriptive Statistics	Mean	Std. Deviation	N
Doctors	102	3.674	5
Nurses	108.2	10.085	5
Dietitians	101	5.339	5
Diabetes Educators	98.8	7.662	5
PWD	84.2	8.701	5

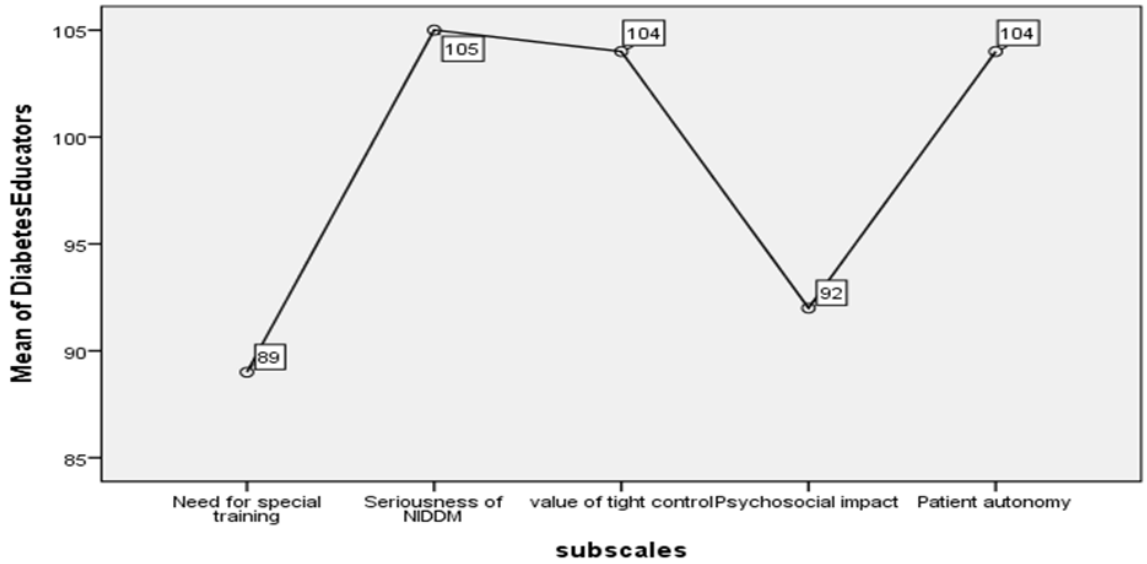
Descriptive Statistics of scales according to all groups

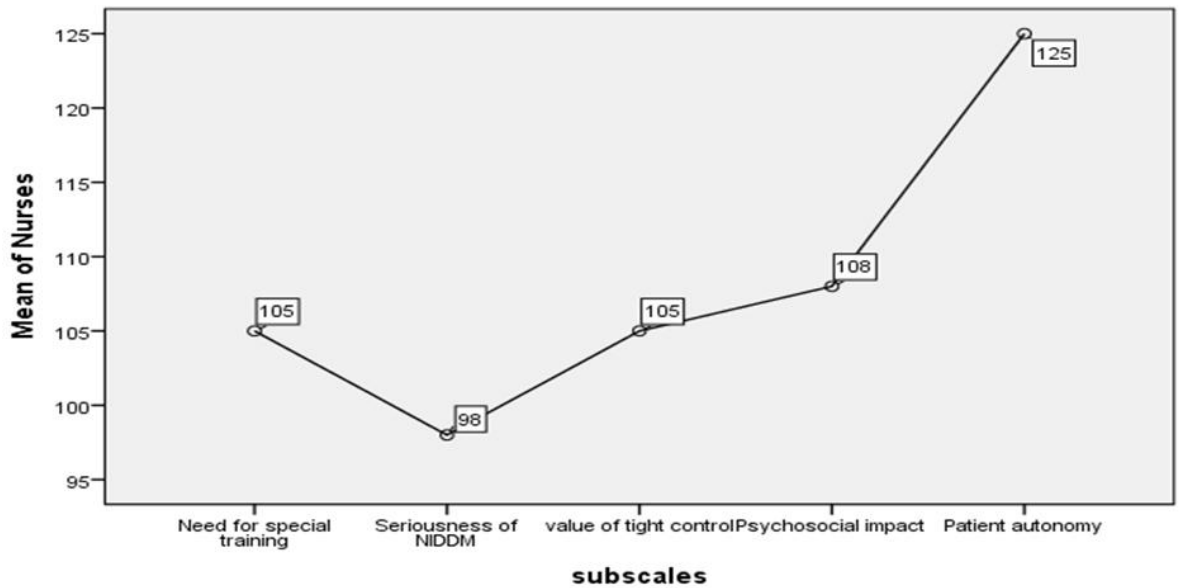
Subscales		Doctors	Nurses	Dietitians	Diabetes Educators	PWD
Need for special training	Mean	101	105	96	89	72
	Median	101	105	96	89	72
	Mode	101	105	96	89	72
Seriousness of NIDDM	Mean	101	98	105	105	87
	Median	101	98	105	105	87
	Mode	101	98	105	105	87
value of tight control	Mean	108	105	107	104	94
	Median	108	105	107	104	94
	Mode	108	105	107	104	94
Psychosocial impact	Mean	102	108	95	92	89
	Median	102	108	95	92	89
	Mode	102	108	95	92	89
Patient autonomy	Mean	98	125	102	104	79
	Median	98	125	102	104	79
	Mode	98	125	102	104	79

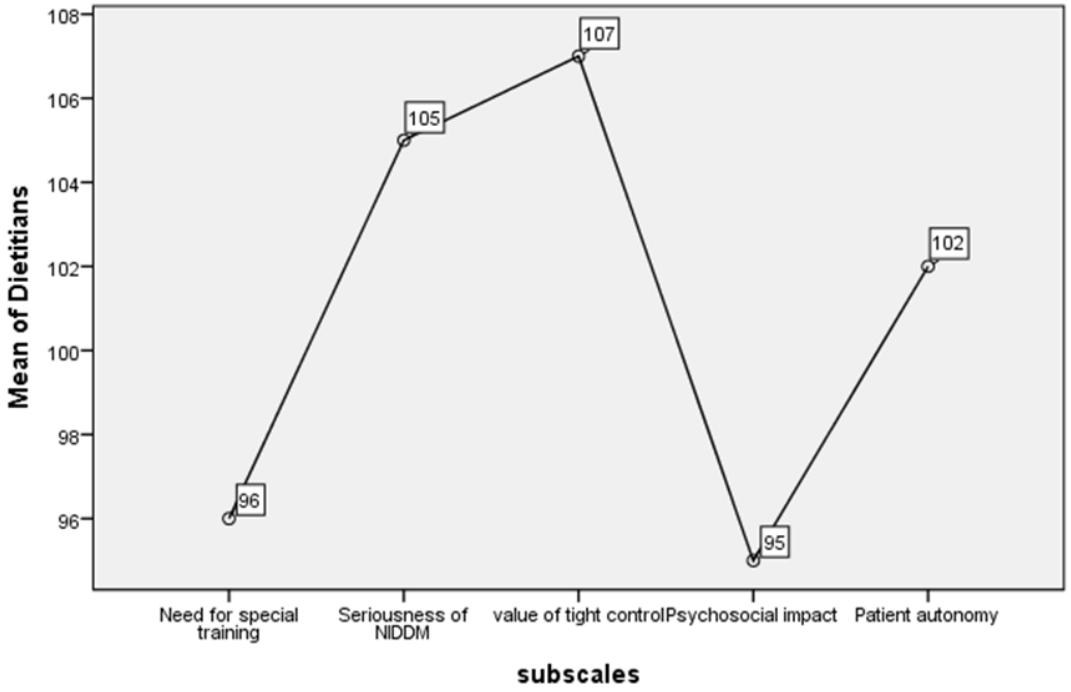
Means plots for subscales

Mean plots are used to see if the mean varies between different subscales in different groups of data.

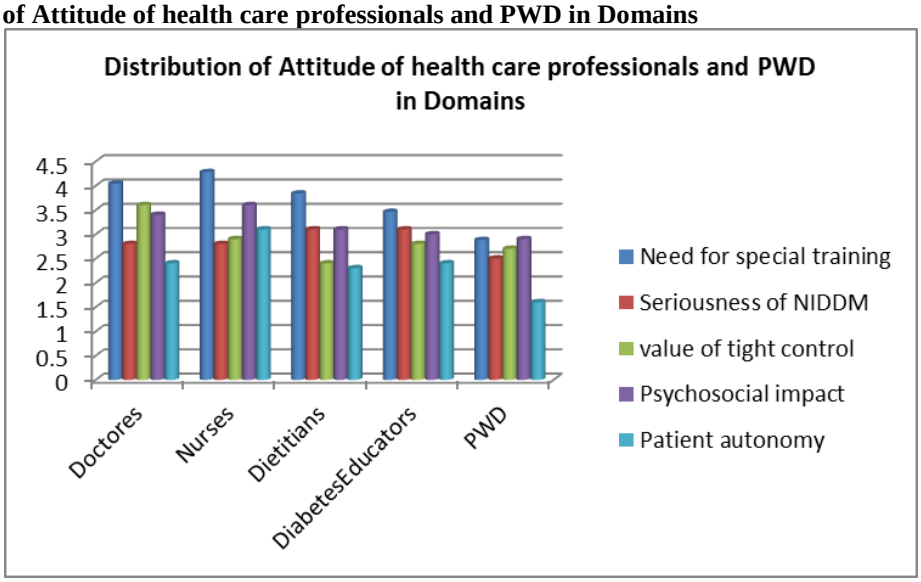








Distribution of Attitude of health care professionals and PWD in Domains



III. Results

Results of the survey (Table 2) are quite striking. Scales whose importance has strong reported evidence such as "seriousness of type 2 diabetes," "value of tight control," an"psychosocial impact of diabetes," received only a slight agreement from the participants (borderlineto the neutral level of 3); it was even worse for "patient autonomy." In the case of "patient autonomy," neitherHCPsorpeople with diabetes considered it an important issue (score below neutral level of 3).

There were significant differences of attitude scorebetween HCPs and people with diabetes at scales 1, 2, and 5. In the first two scales, HCPs recorded higher score values, whileoppositeoccurred with "patient autonomy."

The nurse led clinic could be perceived by people with diabetes as more relevant to their needs. Supported by the results of similar studies by New et al, 2003 & Beas Bhattachrya(2007)

The results show that among the study population (HCPs and peoplewith diabetes in the different health attitudes toward different aspects oftype2 diabetes are not exactly thesame. This statistical difference between the twogroups would not have the same significance or impact from the clinical point of view; in fact, both groups showed a close decreasing trend in the subscale scores, with low agreement values in the items

"seriousness of type 2 diabetes" and "value of tight control,"and disagreement with regard to "patient autonomy." Such a trend represent a clear misconception strong available evidence on the highly negative socioeconomic impact of type 2 diabetes and the positive preventive effect of blood glucose control (1–4, 16–19). Similar consideration is merited by the low importance given to the role of patient participation, patient-provider consensus on treatment goals, and specific strategies designed to meet the goals and to improve patient outcomes (20–25). This misconception does not represent a minor point considering that type 2 diabetes is the predominant form of the disease in the general population, as well as in the diabetes-treated population. Since in most cases, patients are informed by their physicians about the characteristics of their disease, our results could reflect the negative influence of HCPs on patient attitudes rather than a merely casual fact. All in all, these attitudes could be partly responsible for the poor quality of care received by people with type 2 diabetes in , as well as in Consequently, it is crucial to identify and correct the attitudes of HCPs toward the "seriousness of type 2 diabetes" and among people with diabetes, attitudes toward"keepinga tight control of the disease" and the value of "patient autonomy." Appropriate interventions for the redirection of such attitudes must be implemented.Evidence in the literature shows that educationis a useful tool for achieving better results in diabetes care quality, namely: (1) continuing medical and patient education not only improves diabetes knowledge but also attitudes towards the disease (14, 22);(2) the implementation of a diabetes education program for general practitioners significantly improved theirdiabetes-related knowledge and prescriptive (3) On account of these results and of the low technological level required, a wide implementation of diabetes education programs for both HCPs and people with diabetes would be an efficient tool for improving the quality of care and decreasing disease costsin both developed and developing countries. Thus, health decision makers, particularly those from developing countries where economic resources are frequently scarce, should be aware of these results and seriouslyconsider the benefits of testing healthprovider and consumer attitudes, and of incorporating education as part of diabetes care, not only for economic reasons, but also for the quality of life of people with diabetes.

References:

[1]. Brunner & Suddarth's, Textbook of Medical Surgical Nursing, 11th Edition, Vol.2 Pg.2016- 2025
[2]. WHO. Preventing Chronic Diseases: A Vital Investment. India Fact Sheet – Available From www.Who.Int/Chp/Chronic_Disease_Report/En - Accessed On 6 Dec 07
[3]. IDF. Diabetes Atlas. 3rd Edition. International Diabetes Federation. Brussels 2007.
[4]. Mohan V; Indian Journal Of Medical Research 2007; Mar 125(3): 217-30
[5]. Venkataraman K, Kannan At, Mohan V (2009); Challenges In Diabetes Management With Particular Reference To India. Int J Diabetes Dev Ctries 29(3): 103–109.
[6]. ICMR. Assessment of Burdens of NCDS, Indian Council of Medical Research 2006.
[7]. Times of India; September 13, 2012
[8]. Jitender Nagpal and, Abhishek Bhartia, November 2006 ; Quality Of Diabetes Survey diabetes Care 29:11 2341-2348; Doi:10.2337/Dc06-0783
[9]. Census of India: Annual Health Survey 2012 - 13 Fact Sheet www.Censusindia.Gov.In/Vital_Statistics/.../Ahs_Factsheets_2012_13.Htm...
[10]. C.R. Kothari, "Research Methodology Methods & Techniques", 2004;Second Edition, New Delhi: New Age International Publisher, , P. 347.
[11]. Lobiondo-Wood, Geri.Haber, Judith. (1994); Nursing Research: Methods and Critical Appraisal For Evidence-Based Practice Philadelphia. Mosby Publication.
[12]. Seema Abhijeet, Kaveeshwar and Australias Med J. (2014); 7(1): 45–48.Published online Jan 31, 2014. doi: 10.4066/AMJ.2013.1979
[13]. Jain A, Paranjape S. (2013);Prevalence Of Type 2 Diabetes Mellitus In Elderly In A Primary Care Facility: An Ideal Facility, Indian Journal of Endocrinology and Metabolism 2013;17(Suppl1):S318-S322. Doi:10.4103/2230-8210.119647.
[14]. Joshi S R, Diabetes Technol Ther. (2012) Jan;14(1):8-15. DOI: 10.1089/DIA.2011.0243. EPUB 2011 Nov3.Prevalence Of Diagnosed And Undiagnosed Diabetes And Hypertension In India--Results From The Screening India's Twin Epidemic (Site) Study.
[15]. Pradeepa R et al, (2008); Prevalence and Risk Factors for Diabetic Neuropathy in an Urban South Indian Population – The Chennai Urban Rural Epidemiological Study (Cures-55). Diabetes Med 2008;25:407-12.
[16]. Shamima Akter etal (2014);92:204-213A. Department of Epidemiology and Prevention, Clinical Research Center, National Center for Global Health and accepted: 19 November 2013 – Published online: 10 January 2014.
[17]. Sadikot Sm, Nigam A, Das S, et al. (2004); Diabetes India- The Burden of Diabetes and Impaired Glucose Tolerance in India Using the WHO 1999 Criteria: Prevalence of Diabetes in India Study (PODIS). Diabetes Research & Clinical Practice, 2004; 66 : 301-7.
[18]. International Diabetes Federation (Times of India, Nov 14, 2010)
[19]. Ross SA , Tildesley Hd, Ashkenas J., Curr Med Res Opin. (2011) Nov;27 Barriers To Effective Insulin Treatment: The Persistence Of Poor Glycemic Control In Type 2 Diabetes. Suppl 3:13-20. DOI: 10.1185/03007995.2011.621416. EPUB 2011 September, 23.
[20]. Marshall H Chin, (2001);American Diabetes Association, Diabetes Care, Barriers To Providing Diabetes Care In Community Health Centers E-Mail: Mchin@Medicine.Bsd.Uchicago.Edu DOI:10.2337/Diacare.24.2.268diabetes Care February 2001vol. 24 No. 2 268-274
[21]. Gary E Day, Sharon Brownie, (2014); Rising To The Challenge: Nursing Leadership Via Nurse-Led Service Provision For Chronic Disease Management And Prevention. Nursing And Health 2(2): 30-34, 2014. Http://Www.Hrpub.Org.
[22]. Irina Odnoletkova et al, (2014); Nurse-Led Telecoaching of People With Type 2 Diabetes In Primary Care: Rationale, Design and Baseline Data of a Randomized Controlled Trial. Family Practice 2014, 15:24.

[23]. Wegdan Bani-issa1*, Kamal Eldeirawi2, Hanan Al Tawil1 (2015) Perspectives on the Attitudes of Healthcare Professionals toward Diabetes inCommunity Health Settings in United Arab Emirates. Journal of Diabetes Mellitus, 2015, 5, 1-11Published Online February 2015 in SciRes. http://www.scirp.org/journal/jdm

[24]. Fung CS, Chin WY, Dai DS, Kwok RL, Tsui EL, Wan YF, et al. Evaluation of the quality of care of a multi-disciplinary risk factor assessment and management programme (RAMP) for diabetic patients. BMC FamPract. 2012;13:116. doi: 10.1186/1471-2296-13-116. [PMC free article] [PubMed] [Cross Ref]

[25]. Bodenheimer T, Wagner EH, Grumbach K. Improving primary care for patients with chronic illness: The chronic care model, Part 2. J Am Med Assoc. 2002;288(15):1909–14. doi: 10.1001/jama.288.15.1909. [PubMed] [Cross Ref]

[26]. World Health Organization (Europe) and International Diabetes Federation (Europe) Diabetes care and research in Europe: the Saint Vincent declaration. Diabet Med. 1990;7(4):360. doi: 10.1111/j.1464-5491.1990.tb01405.x. [PubMed] [Cross Ref]

[27]. Hansen LJ, Siersma V, Beck-Nielsen H, de Fine Olivarius N. Structured personal care of type 2 diabetes: a 19 year follow-up of the study Diabetes Care in General Practice (DCGP) Diabetologia. 2013;56(6):1243–53. doi: 10.1007/s00125-013-2893-1. [PubMed] [Cross Ref]

[28]. Young D, Furler J, Vale M, Walker C, Segal L, Dunning P, et al. Patient Engagement and Coaching for Health: The PEACH study–a cluster randomised controlled trial using the telephone to coach people with type 2 diabetes to engage with their GPs to improve diabetes care: a study protocol. BMC Family Practice. 2007;8:20. doi: 10.1186/1471-2296-8-20. [PMC free article] [PubMed] [Cross Ref]

[29]. Tomlin A, Dovey S, Tilyard M. Health outcomes for diabetes patients returning for three annual general practice checks. N Z Med J. 2007;120(1252):U2493. [PubMed]

[30]. Fokkens AS, Wiegersma PA, Reijneveld SA. Organization of diabetes primary care: a review of interventions that delegate general practitioner tasks to a nurse. J EvalClinPract. 2011;17(1):199–203. doi: 10.1111/j.1365-2753.2010.01363.x. [PubMed] [Cross Ref]

[31]. Renders CM, Valk GD, Griffin S, Wagner EH, Eijk JT, Assendelft WJ. Interventions to improve the management of diabetes mellitus in primary care, outpatient and community settings.Cochrane Database of Systematic Reviews. 2001;1:001481. [PubMed]

[32]. Jiao FF, Fung CSC, Wong CKH, et al. Effects of the Multidisciplinary Risk Assessment and Management Program for Patients with Diabetes Mellitus (RAMP-DM) on biomedical outcomes, observed cardiovascular events and cardiovascular risks in primary care: a longitudinal comparative study. CardiovascDiabetol. 2014;13:127. doi: 10.1186/s12933-014-0127-6. [PMC free article] [PubMed] [Cross Ref]

[33]. Huang ES, John P, Munshi MN. Multidisciplinary approach for the treatment of diabetes in the elderly.Aging Health. 2009;5(2):207–16. doi: 10.2217/ahe.09.3. [Cross Ref]

[34]. Wilkinson J, Daly M. Reasons for non-attendance: audit findings from a nurse-led clinic. J Prim Health Care. 2012;4(1):39–44. [PubMed]

[35]. Griffin SJ. Lost to follow-up: the problem of defaulters from diabetes clinics. Diabetic Med. 1998;15(Suppl 3):S14–24. doi: 10.1002/(SICI)1096-9136(1998110)15:3+<S14::AID-DIA725>3.3.CO;2-9. [PubMed] [Cross Ref]

[36]. Tesa P, Le Lievre C, Lawrenson R. Why don't patients with diagnosed diabetes attend a free 'Get Checked' annual review? J Prim Health Care. 2009;1(3):222–5. [PubMed]

[37]. Chin MH, Cook S, Jin L, Drum ML, Harrison JF, Koppert J, et al. Barriers to providing diabetes care in community health centers. Diabetes Care. 2001;24(2):268–74. doi: 10.2337/diacare.24.2.268. [PubMed] [Cross Ref]