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Effectiveness of Self-Instructional Module on Knowledge Regarding Home Care Management of Diabetes

Prabha Kharel*

Nepalgunj Nursing Campus, Nepalgunj, Nepal

**Corresponding author*

Abstract

Introduction: According to a report by World Health Organization (WHO) Diabetes Mellitus (DM) caused 1.5 million deaths in 2012, making it the 8th leading cause of death globally and another 2.2 million deaths worldwide due to increased risk of cardiovascular and other diseases by higher-than-optimal blood glucose level in the body, which often leads to premature death. DM is primarily a disease of self-management. In the low and middle income countries, the impact of DM is largely unrecognized. At international and national level, awareness about the public health and clinical important of diabetes remains low. Education in self management of diabetes can improve many important outcomes, such as diabetes knowledge and self-care behaviours. Studies have shown that DM self-management and improved self-care behaviours are associated with improved metabolic control. So the health care professionals' role is to educate the community people about diet, exercise, insulin, care of foot, drugs and raise awareness regarding home management of DM. Simple home care and management can help to prevent and manage DM. The aim of the present study is to assess the effectiveness of self-instructional module on knowledge regarding home care management of diabetes among diabetes patients from selected community area of Bangalore. Materials and Methods: A quantitative approach and a pre-experimental one group pre-test post-test research design were selected for this study. Settings of the study were Narayanpura, Bangalore, Karnataka, India. The samples were 60 adults who met the inclusion criteria and they were selected by purposive sampling technique was used to select the samples for the study. The tool includes socio-demographic profile and self-administered knowledge questionnaire was used to assess the knowledge regarding home care management of diabetes among diabetes patients. Data was analysed using descriptive and inferential statistics. Results: In pre-test, the majority 36 (60%) of the subjects had inadequate knowledge and 24 (40%) of them had moderate knowledge and in the post-test, majority 41 (68.3%) had adequate knowledge 19 (31.7%) obtained moderate knowledge regarding home care management of DM. The Mean \pm SD of pre and post test was 16.88 \pm 3.7 and 30.12 \pm 2.9 respectively and it was found statistically significant. Conclusion: This finding of the study indicates that in the pre-test, majority of the respondents had inadequate knowledge, where in the post test majority the subject had gained knowledge after administration of Self Instructional Module (SIM), enhancing the knowledge of the diabetic patient regarding home care management of DM.

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Keywords

Self Instructional Module, Diabetes patients, knowledge on home care management of Diabetes.

Introduction

WHO defines diabetes as “a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces” (WHO, 1999). Diabetes mellitus, accounts for the vast majority of people with diabetes around the world (WHO, 2016). Diabetes of all types can lead to complications in many parts of the body and can increase the overall risk of dying prematurely. The major long-term complications relate to damage to blood vessels. Diabetes doubles the risk of cardiovascular disease. Possible complications include heart attack, stroke, kidney failure, leg amputation, vision loss and nerve damage. In pregnancy, poorly controlled diabetes increases the risk of foetal death and other complications (WHO, 2016; Bellamy *et al.*, 2009; Sarwar *et al.*, 2009). As of 2016, 422 million people have diabetes worldwide, up from an estimated 382 million people in 2013 and from 108 million in 1980 (WHO, 2016). Accounting for the shifting age structure of the global population, the prevalence of diabetes is 8.5% among adults, nearly double the rate of 4.7% in 1980 (WHO, 2016). Two-thirds of the global diabetes population lives in the developing world. The number of persons with diabetes is expected to increase in developed countries by 41% (from 51 to 72 million) and 170% in developing countries (from 84 to 228 million) by the year 2025 (Unwin and Marlin, 2004). The current diabetes pandemic threatens to be a rapidly expanding burden in future for both developed and developing countries.

The World Health Organization (WHO) estimates that diabetes mellitus caused 1.5 million deaths in 2012, making it the 8th leading cause of death globally and another 2.2 million deaths worldwide due to increased risk of cardiovascular and other diseases by higher-than-optimal blood glucose level in the body, which often lead to premature death (WHO, 2016; Sarwar *et al.*, 2010). The WHO country profile of diabetes reflects that the prevalence of diabetes in India is 7.8% in 2016 (WHO, 2017). Currently, 4.0-11.6 per cent of India’s urban population and three per cent of the rural population above the age of 15 has diabetes. India has been called “the diabetes capital of the world,” and it is estimated that 41million Indians have the disease and “every fifth diabetic in the world is an Indian” (Arun Kumar *et al.*, 2013). For the general public and people at high risk of diabetes, the focus should be on raising awareness of diabetes and disseminating tools for the prevention of diabetes. For people with diabetes the focus should be on disseminating tools to improve Knowledge and Practice

of Home management of diabetics (Sotomayor *et al.*, 2007). Education provides not only a knowledge base but also when it is delivered in a style which is patients centered and appropriate for the age and maturity of the person and the culture of the family it becomes the vehicle for optimal self-management, the key to success.

Diabetes is primarily a disease of self- management. In the low and middle income countries, the impact of diabetes is largely unrecognized. At international and national level, awareness about the public health and clinical important of diabetes remains low. Education in self-management of diabetes can improve many important outcomes, such as diabetes knowledge and self-care behaviours. Studies have shown that diabetes self-management and thus improved self-care behaviours are associated with improved metabolic control. The number of people in the world with diabetes has quadrupled since 1980. Diabetes and higher-than-optimal blood glucose together are responsible for 3.7 million deaths, many of which could be prevented (NCD-RisC, 2016). Diabetes once considered as the problem of developed countries, greatest increase in rates has however been seen in low- and middle-income countries (WHO, 2016), where more than 80% of diabetic deaths occur (Wild *et al.*, 2004), and can be treated and its consequences avoided or delayed with diet, physical activity, medication and regular screening and treatment for complications like foot care (WHO, 2016; Wild *et al.*, 2004; WHO, 2013).

A systematic review done by Sohal Tanveer with 208 extracts and 20 studies to study the barriers and facilitators for type 2 diabetes management in South Asians revealed that management of diabetes remains poor although South Asian populations have among the highest burden of type 2 diabetes in the world. The study also revealed that overall themes for the barriers included lack of knowledge and misperceptions as well as lack of cultural adaptation to diabetes home care management (Tanveer *et al.*, 2015). A hospital based cross sectional study revealed that 53.85% were male and 46.15% female. Majority of the respondents 45.30% were between the age of 41-50 years and 51.28% had duration of disease between 1 to 5 years. Among self-care practices, following a controlled diet ($p = 0.04$), regular exercise ($p = 0.04$) and compliance with drugs ($p = 0.03$) were significantly associated with the achieving glycemic control. The study concluded that patients who have regularly involved in self-care practices had achieved better glycemic control (Padma *et al.*, 2012). A descriptive Study revealed that majority 68% of the subjects had inadequate knowledge on Insulin Self

Administration (ISA) with overall mean score of the knowledge 46.9 ± 3.98 and none of them had good practice. There was a statistically significant positive correlation between knowledge and practice on ISA ($r = 0.62$; $p < 0.05$) (Surendranath *et al.*, 2012). A cross-sectional community-based study findings revealed that 50.8% were females and with a age Mean \pm SD 47.82 ± 11.32 , family history of diabetics ($\chi^2 = 6.173$, $P < 0.05$), tobacco users ($\chi^2 = 4.075$, $P < 0.05$), physical inactivity [diabetes ($\chi^2 = 32.835$, $P < 0.01$) and pre-diabetes ($\chi^2 = 17.430$, $P < 0.01$)] and central obesity [diabetes ($\chi^2 = 37.378$, $P < 0.01$) and pre-diabetes ($\chi^2 = 7.554$, $P < 0.01$)] were found to be significantly associated with diabetes. Multivariate analysis for the risk factors of diabetes revealed physical inactivity [OR 1.4 (1.1-1.9)] to be the one of the prominent risk factors for diabetes (Dasappa *et al.*, 2015).

From the available literature review it was found that there is high prevalence of diabetes mellitus worldwide and in India too. So the health care professionals' role is to educate the community people about diet, exercise, insulin, care of foot, drugs and raise awareness regarding home management of diabetes mellitus. Simple home care and management can help to prevent and manage diabetes. So the researcher found an urgent need to address this health problem by assessing their knowledge regarding the home care management of DM and to evaluate the effectiveness of self-instructional module on home care management to improve their knowledge and to develop positive attitude towards have a effective control over blood sugar level and healthy lifestyle.

Materials and Methods

The research approach adopted for this study was an quantitative approach and one group pre-test post-test pre-experimental design to evaluate the effectiveness of self-instructional module on home care management of diabetes on knowledge among diabetes patients. The study was conducted in community setting, adults with diabetes from Narayanpura, Bangalore, Karnataka, India. In the present study, the target population was adults with DM, accessible population refers to adults with DM, from Bangalore, Karnataka, India and the Sample comprised of 60 adults having diabetes who are living in Narayanpura, Bangalore. Karnataka, India were selected by purposive sampling technique. The data was collected by using self-administered questionnaire which includes social-demographic profile and knowledge regarding home care management of DM, the sub items were categorised as general information of about

Diabetes, causes and risk factors, home care management of DM-dietary management, exercise and weight management, foot and wound care, life style modification, the tool was found to be reliable with a reliability co-efficient of $r = 0.9250$ and self-instructional module on knowledge regarding home care management of Diabetes Mellitus which was developed by the researcher. Pre test was conducted using the Questionnaire and administered SIM to the diabetic patients and post test was conducted on the 8th day after administration of SIM using the same Questionnaire. The data obtained were analysed using both descriptive and inferential statistics. Demographic characteristics were analysed using frequencies and percentage. The knowledge score before and after the administration of the self-instructional module and its effectiveness was calculated by using mean, standard deviation and 't' test. Chi square test was used to find the association between the pre-test knowledge score with selected socio-demographic variables of Diabetic patients.

Results and Discussion

Description of Socio-demographic Profile of the Diabetic patients

Table 1 shows the socio-demographic characteristics of Diabetic patients. Regarding the age group majority of the samples 26 (43.4%) were in the age group of 51-60 years, 23 (38.3%) were in the age group of 41-50 years and 11 (18.3%) were in the age group of 31-40 years. With regards to gender, majority of the respondents were males 41 (68.3%) and 19 (31.7%) were females. Based on the educational level, majority of the respondents 20 (33.33%) completed SSLC, 17 (28.4%) attended till PUC, 15 (25%) were graduated, and 8 (13.3%) studied below SSLC. With regards to the occupation of the respondents 20 (33.3%) were doing private job, 19 (31.7%) were homemakers, 15 (25%) were government employees and 6 (10%) were self-employed. Regarding the religion majority 52 (86.7%) belongs to Hindu religion, followed by 8 (13.3%) from Christian religion. Based on the type of family, half 30 (50%) of the respondents belongs to nuclear family and 30 (50%) belongs to joint family respectively. According to the respondents family income, majority 28 (46.7%) of the respondents having the monthly income of Rs. 20001-30000, 17 (28.3%) of them having Rs. 10000-20000 and 15 (25%) have monthly income ranging from Rs. 30001-40000 respectively. According to the duration of Diabetes Mellitus, majority of the respondents 26 (43.3%) were having Diabetes since 3-5 years, 14

(23.3%) were having Diabetes since 6-8 years and 20 (33.4%) of the respondents were having Diabetes since 9-10 years. Regarding the type of DM majority 39 (65%) were suffering from NIDDM and 21 (35%) were suffering from IDDM respectively.

With respect to the presence of DM among family member, majority of the respondents 37 (61.7%) don't have diabetes among family members and the remaining 23 (38.3%) of them have Diabetes. With regard to the relationship of diabetic member of the family, 15 (25%) were fathers, 8 (13.3%) were mothers.

According to source of information from which the diabetic patients received information regarding the care of diabetes were from health personal 15 (25%), 15 (25%) through their family members/relatives, 14 (23.3%) print media, 11(18.3%) electronic media and 5 (8.4%) from their friends/neighbours.

Pretest and Post test Knowledge Scores of the Respondents on Home Care Management of Diabetes

The table 2 reveals the Frequency and percentage distribution of Pre and Post test scores of Knowledge regarding the Home care of management of Diabetes. It was observed in the pre test that the majority of the respondents 36 (60.0%) had inadequate knowledge and 24 (40%) of them had moderate knowledge. In the post-test, majority 41 (68.3%) of them had obtained adequate knowledge regarding home care management of Diabetes Mellitus and remaining 19 (31.7%) obtained moderate knowledge regarding home care management of Diabetes Mellitus. The same has been depicted in the figure 1.

Effectiveness of Self Instructional Module on Knowledge regarding Home Care Management of Diabetes Mellitus among Diabetic Patient

Table 3 reveals the Mean and SD of Pre-test and Post-test scores of Knowledge on home care management of Diabetes Mellitus among Diabetic patients. In the pre test the over all Mean±SD was 16.88±3.7 and in the post test it was 30.12±2.9 (t-20.97, p<0.05). It was inferred that there was a significant gain in the knowledge regarding home care management of Diabetes Mellitus among Diabetes patients. Thus it was proved that the Self-Instructional Module was effective in enhancing the knowledge regarding home care management of Diabetes Mellitus.

Table 4 shows the Mean and SD of aspect-wise pretest and posttest score on Knowledge regarding the home care management of Diabetes Mellitus. In the pre test with regard to general information the Mean and SD was 5.88±1.2 and in the post test it was 9.73±1.3 (t-16.47, p<0.05). Regarding the risk factors and causes of DM, in the pre test the Mean and SD was 2.02±0.8 and in the post test it was 3.50±0.6 (t-12.49, p<0.05). Inrelation to the exercise and weight management, the Mean and SD of the pre test was 2.53±0.9 and in post test it was 4.50±0.8 (t-12.33, p<0.05). With regards to the dietary management, the pre test the Mean and SD was 1.35±0.9 and in the post test it was 2.78±0.8 (t-10.08, p<0.05). Regarding the knowledge of foot and wound care, the Mean and SD of the pre test was 3.43±1.0 and in post test it was 5.22±0.8 (t-11.11, p<0.05). In the aspect of life style modification, the Mean and SD of the pre test was 2.02±0.8 and in post test it was 3.50±0.6 (t-12.49, p<0.05). It was inferred that in the aspect wise Mean and SD of post test scores of knowledge showed that the Diabetic patients had gained adequate knowledge in all selected aspects of home care management of Diabetes Mellitus. It was evident that the self-instructional module was significantly enhanced the knowledge regarding aspects of home care management of Diabetes Mellitus among Diabetic patients. The same has been represented in the figure 2.

Association between the pretest scores of Knowledge regarding Home Care Management of Diabetes Mellitus with selected Socio-demographic variables of Diabetic Patients

Table 5 shows the association between pretest scores of Knowledge regarding home care management of Diabetes Mellitus with selected demographic variables of the Diabetic patients. It was found that there was significant association between the pretest scores of knowledge regarding home care management of DM with selected socio-demographic variables such as gender (χ^2 -4.16, p<0.05), type of family (χ^2 -4.44, p<0.05), type of Diabetes (χ^2 -5.91, p<0.05), diabetic patient in family (χ^2 -4.24, p<0.05), and relationship with the client (χ^2 -6.09, p<0.05). It was also found that there was no significant association between the pretest scores of knowledge regarding home care management of DM with selected socio-demographic variables such as age (χ^2 -1.36, p>0.05), education status (χ^2 -1.65, p>0.05), occupation (χ^2 -1.51, p>0.05), religion (χ^2 -0.02, p>0.05), family income per month (χ^2 -1.28 p>0.05), since how long under Diabetes (χ^2 -0.17, p>0.05) and source of information about DM (χ^2 -1.96, p>0.05).

Socio- demographic characteristics of the respondents

In the present study regarding the age majority of the respondents 43.4% belongs to 51-60 years of age group and 38.3% of respondents belongs to 41-50 years of age group. In a study by Mohan *et al.*, (2005) reported that the participants were having the age of 47.82 ± 11.32 . In another study by Tukaram *et al.*, (2014) majority 35% Diabetic patients belongs to the above 40 years of age (Tanveer *et al.*, 2015). With regards to gender, majority of the respondents were males 41(68.3%).

In contrary to the study by Mohan *et al.*, (2005) reported that both gender were having DM (Dasappa *et al.*, 2015). Tanveer (2015) found that majority of participants were women with age range 20–80 years. Another study by Tukaram *et al.*, (2014) showed that the majority of the respondents 62.5% were males¹⁸. Regarding the educational level majority 33.33% had completed SSLC and 28.4% attended till PUC. The findings were similar to the study by Tukaram *et al.*, (2014) most of the respondents 42.5% had taken secondary education (Tukaram Zagade *et al.*, 2014). In contrary another study Ahmed *et al.*, (2016) the participants had higher educational background. With regard to the occupation majority of the respondents 33.3% were doing private job, and 31.7% were homemakers.

In a study by Tukaram *et al.*, (2014) majority 47.5% of the patients were employed. Regarding the religion, majority of respondents 86.7% belongs to Hindu religion. Similar finding reported by Tukaram *et al.*, (2014) the maximum number of respondents 95% were from Hindu religion. Regarding the type of family, equal and half 50% of the respondents belongs to nuclear family and joint family. With regards to family income the majority 46.7% having the monthly income of Rs. 20001 -30000. In a study by Tukaram *et al.*, (2014) the maximum number of respondents 42.5% had their family monthly income Rs. 15001 & above. Another study by Ahmed *et al.*, (2016) reported that the participants were from upper socio-economic class.

When considering the duration of illness majority of the respondents 43.3% were having Diabetes since 3-5 years, and 33.4% of the respondents were having Diabetes since 9-10 years. Similar study by Tukaram *et al.*, (2014) reported that Diabetic patients were having DM since 1-5 years. When considering type of DM, majority of the respondents 65% were suffering from NIDDM (Type-II) and it shows that most common type of Diabetes Mellitus is NIDDM. In a study by Mohan *et al.*,

(2005) identified patients with pre-diabetes ($\chi^2 = 17.430$, $P < 0.01$) and central obesity [diabetes ($\chi^2 = 37.378$, $P < 0.01$) and pre-diabetes ($\chi^2 = 7.554$, $P < 0.01$)] were found to be significantly associated with diabetes.

In a study conducted Tanveer (2015) reported that South Asian populations have highest burden of type 2 diabetes in the world and occurs at 50% higher rates in South Asian patients compared to the general population. Similar findings were reported by Tukaram *et al.*, (2014). 47.5 % of the respondents had Type-II Diabetes Mellitus. Majority of the respondents 61.7% don't have any family member with DM and 38.3% of the respondents had diabetic members in their family. Similar study Mohan *et al.*, (2005) reported significant family history of diabetics ($\chi^2 = 6.173$, $P < 0.05$), tobacco users ($\chi^2 = 4.075$, $P < 0.05$), and physical inactivity [diabetes ($\chi^2 = 32.835$, $P < 0.01$)]. A study by Shrestha *et al.*, (2015) revealed that among the diabetic patients, 51.5% reported to have family history of diabetes.

With regard to the relationship to the respondents, 25% were fathers and 13.3% were mothers. Regarding the source of information regarding the care of diabetes, respondents received information 25% from health personal and 25% from family members/relatives. In a study by Tukaram *et al.*, (2014) mentioned that majority 95% of the patients had some amount of knowledge about complications of diabetes mellitus and they have received information about diabetes mellitus from television, and majority 77.5% of them received information from Newspaper.

Comparison of overall and aspect wise pretest and posttest scores on Knowledge regarding Home Care Management of Diabetes Mellitus among Diabetic Patients

In the present study, it was observed that the Mean pre-test knowledge score of the respondents (60%) regarding home care management of Diabetes was inadequate and 40% of the samples demonstrated moderate knowledge. It is so astounding to observe that none of the samples had adequate knowledge regarding home care management of Diabetes Mellitus.

A study by Ahmed *et al.*, (2016) the finding supported the present study, it was revealed that 18.7% had knowledge regarding the complications of diabetes mellitus and only 8.6% of participants checked their blood glucose levels at home regularly, and only 4.3% visited their physicians regularly for check-ups.

Table.1 Frequency and percentage distribution of socio-demographic characteristics of Diabetic patients

(N=60)

Sl. No.	Characteristics	Category	Respondents	
			Number	Percent
1.	Age group (years)	31-40	11	18.3
		41-50	23	38.3
		51-60	26	43.4
2.	Gender	Male	41	68.3
		Female	19	31.7
3.	Educational level	< SSLC	8	13.3
		SSLC	20	33.3
		PUC	17	28.4
		Graduate	15	25.0
4.	Occupational status	Self employed	6	10.0
		Private	20	33.3
		Government	15	25.0
		House wife	19	31.7
5.	Religion	Hindu	52	86.7
		Christian	8	13.3
6.	Type of family	Nuclear	30	50.0
		Joint	30	50.0
7.	Family income/month	Ra.10,000-20,000	17	28.3
		Rs.20,001-30,000	28	46.7
		Rs.30,001-40,000	15	25.0
8.	Since how long under Diabetes	3-5 years	26	43.3
		6-8 years	14	23.3
		9-10 years	20	33.4
9.	Type of Diabetes	NIDDM	39	65.0
		IDDM	21	35.0
10.	Have diabetic client in family	Yes	23	38.3
		No	37	61.7
11.	Relationship with client	Father	15	25.0
		Mother	8	13.3
		Not applicable	37	61.7
12.	Source of information	Health personal	15	25.0
		Print media	14	23.3
		Electronic media	11	18.3
		Friends/Neighbours	5	8.4
		Family members/Relatives	15	25.0

Table.2 Frequency and percentage distribution of Pre and Post test scores of Knowledge regarding the Home care of management of Diabetes.

(N=60)

Knowledge Level	Category	Pre test		Post test	
		Frequency	Percentage	Frequency	Percentage
Inadequate	≤ 50 % Score	36	60.0	0	0.0
Moderate	51-75 % Score	24	40.0	19	31.7
Adequate	> 75 % Score	0	0.0	41	68.3

Table.3 Mean and SD of Pre-test and Post-test scores of Knowledge on home care management of Diabetes Mellitus. (N=60)

Tests	Respondents Knowledge		Paired 't' Test	Significance
	Mean	SD		
Pre-test	16.88	3.7	20.97*	p<0.05
Post-test	30.12	2.9		

* Significant at level of p<0.05.

Table.4 Mean and SD of aspect-wise Pre-test and Post test score on Knowledge regarding the home care management of Diabetes Mellitus (N=60)

No.	Aspect-wise Knowledge	Max. Score	Pre test		Post test		Paired 't' Test
			Mean	SD	Mean	SD	
I	General Information on Diabetes	12	5.88	1.2	9.73	1.3	16.47*
II	Risk factors and Causes of Diabetes	4	2.02	0.8	3.50	0.6	12.49*
III	Exercise and weight Management	6	2.53	0.9	4.50	0.8	12.33*
IV	Dietary management of diabetes mellitus	4	1.35	0.9	2.78	0.8	10.08*
V	Foot and wound care	6	3.43	1.0	5.22	0.8	11.11*
VI	Life style modification	4	2.02	0.8	3.50	0.6	12.49*

* Significant at level of p<0.05.

Fig.1 Bar diagram depicting frequency and percentage distribution of Pre and Post test scores of Knowledge on Home care management of Diabetes

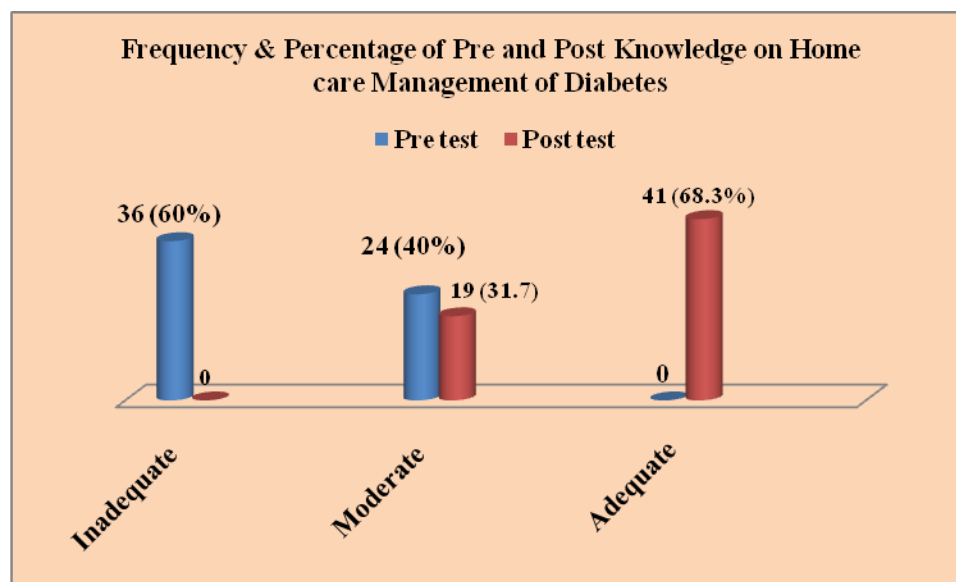


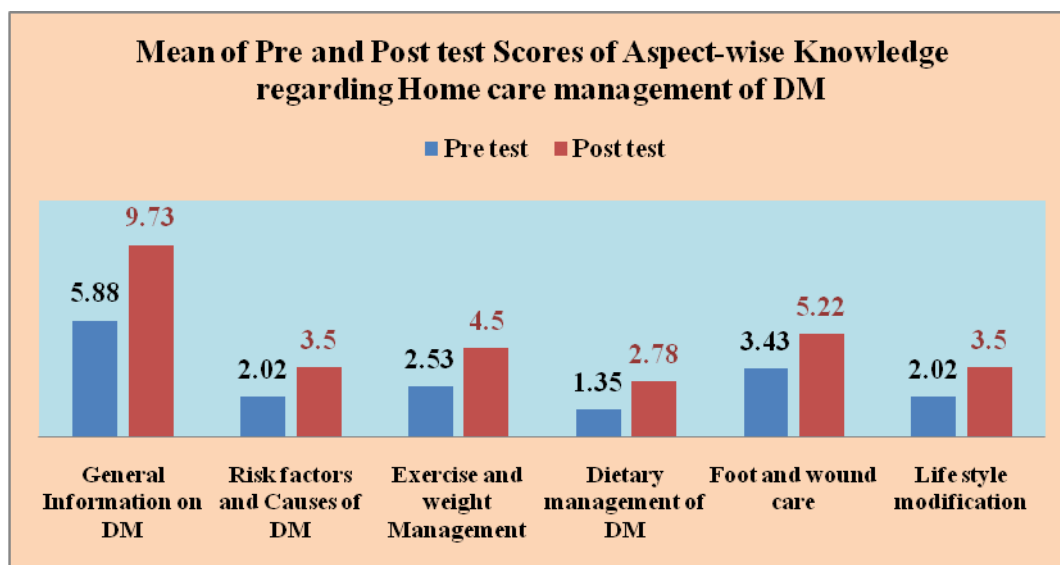
Table.5 Association between pretest scores of Knowledge regarding home care management of Diabetes Mellitus with selected demographic variables of respondents.

(N=60)

Demographic Variables	Category	Knowledge Level				χ^2 Value	P Value
		Inadequate		Moderate			
		N	%	N	%		
Age group (years)	31-40	8	72.7	3	27.3	1.36 NS	P>0.05 (5.991)
	41-50	12	52.2	11	47.8		
	51-60	16	61.5	10	38.5		
Gender	Male	21	51.2	20	48.8	4.16*	P<0.05 (3.841)
	Female	15	79.0	4	21.0		
Educational level	< SSLC	5	62.5	3	37.5	1.65 NS	P>0.05 (7.815)
	SSLC	10	50.0	10	50.0		
	PUC	12	70.6	5	29.4		
	Graduate	9	60.0	6	40.0		
Occupational status	Self employed	4	66.7	2	33.3	1.51 NS	P>0.05 (7.815)
	Private	10	50.0	10	50.0		
	Government	9	60.0	6	40.0		
	House wife	13	68.4	6	31.6		
Religion	Hindu	31	59.6	21	40.4	0.02 NS	P>0.05 (3.841)
	Christian	5	62.5	3	37.5		
Type of family	Nuclear	22	73.3	8	26.7	4.44*	P<0.05 (3.841)
	Joint	14	46.7	16	53.3		
Family income/month	Ra.10,000-20,000	12	70.6	5	29.4	1.28 NS	P>0.05 (5.991)
	Rs.20,001-30,000	15	53.6	13	46.4		
	Rs.30,001-40,000	9	60.0	6	40.0		
Since how long under Diabetes	3-5 years	15	57.7	11	42.3	0.17 NS	P>0.05 (5.991)
	6-8 years	9	64.3	5	35.7		
	9-10 years	12	60.0	8	40.0		
Type of Diabetes	NIDDM	19	48.7	20	51.3	5.91*	P<0.05 (3.841)
	IDDM	17	80.9	4	19.1		
Have diabetic patient in family	Yes	10	43.5	13	56.5	4.24*	P<0.05 (3.841)
	No	26	70.3	11	29.7		
Relationship with client	Father	5	33.3	10	66.7	6.09*	P<0.05 (5.991)
	Mother	5	62.5	3	37.5		
	Not applicable	26	70.3	11	29.7		
Source of information about DM	Health personal	9	60.0	6	40.0	1.96 NS	P>0.05 (9.488)
	Print media	9	64.3	5	35.7		
	Electronic media	8	72.7	3	27.3		
	Friends/Neighbours	3	60.0	2	40.0		
	Family members/Relative	7	46.7	8	53.3		

* Significant at 5% Level,

NS: Non-significant

Fig.2 Aspect wise Mean of pretest and posttest scores of aspect-wise knowledge on home care management of Diabetes Mellitus

In a descriptive study by Elliott (2013) revealed that a quarter of study subjects 26% were unaware how to recognize hypoglycaemia correspond to it, around half 49% could not recognize hyperglycaemia and more than half 60% could not respond to it. Patients with formal education generally had more diabetes self-management and education than those without ($p < 0.001$). So this study concluded that the knowledge on home care management of Diabetes among the community people is suboptimal and to prevent diabetes and its complications there is urgent need for coordinated educational campaigns with a prioritized focus on poorer, rural and less educated groups. In another study by Raymond G. Mabaso *et al.*, (2016) recognized that most of the study subjects (68.3%) did not know the types of DM and only 32.4% knew the type of DM. Many knew about the importance of special diet (84.5%) and physical activity (64.4%) in DM management; however, only 52% knew about the importance of losing weight. Many (71.5%) followed a special diet as advised, only 29.1% always tried to lose weight, and 48.3% engaged in physical activity. Many (82.6%) knew that DM could cause vision problems, but only 49.3% have had their eyes examined, the findings suggesting the need for programs on DM awareness among the Diabetic patients (Raymond G. Mabaso *et al.*, 2016). Islam *et al.*, (2015) reported that overall, 45.6% participants had good, 37.7% moderate and 16.7% poor knowledge on diabetes. The mean composite score was 0.75 ± 0.28 and the proportion of participants with a score of $\leq 50\%$ was 16.7%. Only 24.3% participants identified physical inactivity as a risk

factor for diabetes (Islam *et al.*, 2015). A study by Shrestha *et al.*, (2015) revealed that the Mean \pm SD of Diabetes knowledge Questionnaire (DKQ) score of the respondents was 11.0 ± 3.32 . Most commonly missed questions included role of diabetes in blood circulation, diabetic diet, signs of hypoglycaemia, hyperglycaemia, and importance of insulin in diabetes. A cross sectional study by Chaurasia *et al.*, (2015) reported that among the study subjects, 31.77% had poor knowledge and only 10.93% had good knowledge of diabetes mellitus. Though most of the diabetic patients knew that self-care can decrease the complications, more than two third subjects had uncontrolled blood sugar level Chaurasia *et al.*, (2015).

Effectiveness of Self Instructional Module on knowledge regarding Home Care Management of Diabetes Mellitus

In the pre test the overall Mean \pm SD was 16.88 ± 3.7 and in the post test it was 30.12 ± 2.9 ($t=20.97$, $p < 0.05$). In the pre test with regard to general information the Mean and SD was 5.88 ± 1.2 and in the post test it was 9.73 ± 1.3 ($t=16.47$, $p < 0.05$). Regarding the risk factors and causes of DM, in the pre test the Mean and SD was 2.02 ± 0.8 and in the post test it was 3.50 ± 0.6 ($t=12.49$, $p < 0.05$). In relation to the exercise and weight management, the Mean and SD of the pre test was 2.53 ± 0.9 and in post test it was 4.50 ± 0.8 ($t=12.33$, $p < 0.05$). With regards to the dietary management, the pre test the Mean and SD was 1.35 ± 0.9 and in the post test it was 2.78 ± 0.8 ($t=$

10.08, $p < 0.05$). Regarding the knowledge of foot and wound care, the Mean and SD of the pre test was 3.43 ± 1.0 and in post test it was 5.22 ± 0.8 ($t=11.11$, $p < 0.05$). In the aspect of life style modification, the Mean and SD of the pre test was 2.02 ± 0.8 and in post test it was 3.50 ± 0.6 ($t=12.49$, $p < 0.05$). It was inferred that in the overall and aspect wise Mean and SD of post test scores of knowledge showed that the Diabetic patients had gained adequate knowledge in all selected aspects of home care management of Diabetes Mellitus. It was evident that the self-instructional module was significantly enhanced the overall and aspects-wise knowledge of home care management of Diabetes Mellitus among Diabetic patients. It was inferred that there was a significant gain in the knowledge regarding home care management of Diabetes Mellitus among Diabetes patients. Thus it was proved that the Self-Instructional Module was effective in enhancing the knowledge regarding home care management of Diabetes Mellitus. In other study by Herath *et al.*, (2017) mentioned that 39% moderate and 38% had above moderate knowledge DM. With regards to practices, more than half of study subjects never had their blood sugar checked and, about 65% used to take refined sugar liberally and a large majority 80% had no regular exercise activity and majority 88% had poor attitude about DM (Herath *et al.*, 2017). Similar study by Saleh *et al.*, (2017) reported that after the intervention, the Mean score of knowledge (8.5 ± 2.6 vs. 5.5 ± 2.9) and attitudes (85.7 ± 6.1 vs. 79.9 ± 6.5) of the patients improved significantly ($p < 0.001$). About 67.7%, 85.2%, 82.8% and 92.1% of the patients were monitored for blood glucose, doing exercises, taking foot care and smoking withdrawal whereas the rates were 8.3%, 69.2%, 25.8% and 86.7%, respectively before the intervention; about 25.5% followed the dietary advice given by dietitians whereas it was only 5.2% at the pretest; there were significant changes between the pretest and posttest measures ($p < 0.001$) (Saleh *et al.*, 2017). Anuar *et al.*, (2016) recognized that the total scores for Knowledge, Attitude and Practice (KAP) in the intervention group was improved after the diet counseling, as compared to the control group. Similar findings in a study by Tukaram *et al.*, (2014) identified that in the pre-test, majority 75% patients had average knowledge, 7.5% had good knowledge, and 17.5% had poor knowledge, where as in post-test majority of 70% had average knowledge, 20% had poor knowledge and 10% had a good knowledge. The findings suggested that SIM was found to be a very effective method of providing information regarding prevention of microvascular and macrovascular complications Tukaram *et al.*, (2014).

Association between the pretest scores of Knowledge regarding Home Care Management of Diabetes Mellitus with selected socio-demographic variables of Diabetic Patients

In the present study association was sought between the pre-test knowledge scores of the Diabetes Patient with their selected socio-demographic variables. A significant association was found between the pre-test knowledge scores of Diabetes patients and their socio-demographic variables such as gender ($\chi^2=4.16$, $p < 0.05$, type of family ($\chi^2=4.44$, $p < 0.05$), type of Diabetes ($\chi^2=5.91$, $p < 0.05$), have Diabetes client in family ($\chi^2=4.24$, $p < 0.05$), and relationship with the client ($\chi^2=6.09$, $p < 0.05$). The characteristics such as age, education, occupation, religion, family income, duration of illness and source of information are found to be non-significant to home care management of Diabetes Mellitus. The following studies support the present study, A study by Ahmed *et al.*, (2016) reported that educational background and upper socio-economic class demonstrated significantly greater score in terms of KAP in both nonDM and T2DM groups ($p < 0.001$). On linear regression analysis, knowledge scores correlated strongly with education, income, residence, diabetic state, BMI and attitude Tukaram *et al.*, (2014). A study by Shrestha *et al.*, (2015) revealed that a significant relationship existed between DKQ score and age, marital status, level of education, occupation, and patients with family history of diabetes. A cross sectional study by Herath *et al.*, (2017) mentioned that the association of gender and age with knowledge was not significant. In another study by Islam *et al.*, (2015) identified that Knowledge on diabetes was significantly associated with education, gender, monthly income, duration of diabetes, body mass index, family history of diabetes, and marital status.

Especially middle age adults are more commonly suffering by Diabetes Mellitus since centuries, which in turn is silent killer disease. Keeping this aspect in preview, the present study was conducted to evaluate the Effectiveness of a self-instructional module on knowledge regarding home care management of Diabetes Mellitus among Diabetes patient from selected community area of Bangalore. This finding of the study indicates that in the pretest, majority of the respondents had inadequate knowledge, where in the post test majority the subject had gained knowledge after administration of Self Instructional Module (SIM), enhancing the knowledge of the Diabetic patient regarding home care management of DM

Recommendations

- The study can be replicated on a larger sample; thereby findings can be generalized for a larger population.
- A video assisted teaching programme can be prepared to enhance the knowledge of people regarding prevention of Diabetes Mellitus.
- Regular educational programmes can be conducted among community people regarding Diabetes home care management.
- A comparative study can be done to find out the knowledge on Diabetes Mellitus among Diabetic patient at urban setting.
- A similar study can be conducted to compare the knowledge and practice level of people between urban and rural communities.
- A similar study can be conducted with randomization of samples for generalization of the findings.

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