NON ADHERENCE TO LIFESTYLE MODIFICATIONS AND SELF CARE MANAGEMENT AND ITS DETERMINANTS AMONG DIABETIC PATIENTS IN THIRUVALLUR DISTRICT – A CROSS SECTIONAL STUDY

Community Medicine

Seetha Kumari. M	Post Graduate, Department of Community Medicine, Govt. Stanley Medical College, Chennai.
Seenivasan. P*	Professor, Department of Community Medicine, Govt. Stanley Medical College, Chennai. *Corresponding Author

ABSTRACT

Background: Complications of diabetes mellitus could be decreased by maintaining a good glycemic control, which is dependent on adherence to self-care and lifestyle modification

Objectives: To assess the non-adherence to lifestyle modifications and self-care management and its determinants among diabetic mellitus patients in Thiruvallur district.

Methods: This was a cross sectional study with 500 diabetic patients were selected by simple random sampling method from June 2017 to October 2017 using pre-tested semi-structured questionnaire.

Results: 21.4% were aged above 60 years and 79% were females. Non adherence rate for lifestyle modifications and self-care management are diabetic diet plan (81%), physical activity (68.8%), blood glucose monitoring (20.2%), foot care (69.6%) and for medication (1.80%).

Conclusion: Most common reason for non-adherence was lack of knowledge and this supports the need for intensive education and awareness about self-care and life style modifications of diabetes mellitus.

KEYWORDS

Non adherence, Diabetic diet plan, Foot care

INTRODUCTION:

Diabetes mellitus is the major public health problem, globally growing as an epidemic both in developed and developing countries. India is the second most populous country to have a large number of people with diabetes mellitus. Diabetes mellitus will be the 7th leading cause of death in 2030. Prevalence of diabetes rising more rapidly in middle and low-income countries[1]. According to IDA global estimates, number of people with diabetes in 2015 is 415 million (8.8% of the population) which will be drastically increasing to 642 million (521 – 829 million) by 2040. In India, 69.2 million people affected with diabetes which will increase to 123.5 million by 2040. In India 40.8 (52.1%) million people with were undiagnosed[2]. Diabetes is a chronic metabolic disease leads to complications, if non adherent to its management. Definition of adherence according to World Health Organisation, is the extent to which a person's behaviour – taking medication, following a diet, and/or performing lifestyle changes corresponds with agreed recommendations from the health care provider[1]. Self-care practices are defined as the set of behaviours by a people with or at risk of diabetes mellitus in order to successfully to manage the disease of their own[3]. Adherence to Life style and self-care practices proven to be effective in diabetes mellitus management. These also found to have significant impact on better glycemic control and to reduce the incidence of both microvascular and microvascular complication of diabetes mellitus[3]. Adherence is the foremost issue and huge burden in our health system. In developing countries like India, due to economic instability, low literacy level and restricted access to health care system might have led to increase in non-adherence[4]. Patient non adherence is the serious threat that poses a great challenge in the successful delivery of healthcare and has been reported from all over the world.[5] Glycemic control and prevention of complications can be achieved by adherence to lifestyle modifications and self-care. Thus, the present study was conducted with the objectives to assess the non-adherence to lifestyle modifications and self-care management and its determinants among diabetic mellitus patients in Thiruvallur district.

MATERIALS AND METHODS:

This was a community based cross-sectional study carried out among diabetic patients residing in Minjur, Thiruvallur district from June 2017 to October 2017. Based on the study by Medi, et al[4] medication adherence rate of 47.85%, by using formula $n = Z^2 pq/d^2$ with relative precision of 10% and standard normal deviation(Z) set at 1.96, which corresponds to 95% confidence interval and adjusted for a non-response rate of 10%. Final required sample size calculated was 460. Rounded off to 500 study population. Line listing of Diabetic patients residing in Minjur taken from Non- communicable register maintained in Minjur Block Primary Health Centre, Thiruvallur. By computer generated random number, 500 diabetic patients were selected by simple random sampling method. Both men and women diagnosed with diabetes mellitus for more than six months duration and those

who are willing to give informed consent were enrolled in the study and recently diagnosed diabetes mellitus or within six months of duration were excluded. Pre-tested semi structured questionnaire was used which contained three parts such as respondents basic socio-demographic details, details of adherence pattern to life style modifications and self-care like diet pattern, physical activity, foot care, blood glucose monitoring and intake of medicines and reason for non-adherence if present. Data collected were entered to Microsoft excel computer program. Descriptive and Analytical statistics were analysed using SPSS software version 23. p value of less than 0.05 were considered to be statistically significant.

ETHICAL CONSIDERATIONS:

The study was approved by the Institutional Ethical Committee, Government Stanley Medical College and Hospital. Informed consent were obtained from each study respondents.

OPERATIONAL DEFINITIONS FOR NON ADHERENCE:

Diet: Individuals not followed the recommended dietary chart, not maintain specific time of food intake and not followed advised quantity and quality of food.

Physical activity: Individuals did not exercise or brisk walking for at least 30 minutes a day for 4 days or more in a week.

Blood glucose monitoring: Individuals did not monitor blood glucose at least once in six months as recommended by the hospital.

Foot care: Individuals not followed the basic foot principles such as daily foot examination, washing and drying foot, applying oil or moisturizers and cutting nail.

Medication: Individuals did not take daily medications regularly as per the physician's advice.

RESULTS:

Total of 500 diabetic patients were enrolled in the study, 44.4% of the study population belongs to 50-59 years and 79% of them are females. Basic demo-graphic characteristics of the study populations are given in Table 1.

Table 1: Socio-demographic characteristics of the study population (N = 500)

Characteristics		Frequency (%)
Age (years)	30 – 39	27(5.4)
	40 – 49	144(28.8)
	50 – 59	222(44.4)
	≥ 60	107(21.4)

Sex	Male	105(21)
	Female	395(79)
Marital status	Single	4(0.8)
	Married	408(81.6)
	Widowed or divorced	88(17.6)
Educational status	Illiterate	145(29)
	Primary school certificate	150(30)
	Middle school certificate	82(16.4)
	High school certificate	101(20.2)
	Post high school certificate	11(2.2)
	Graduate or post graduate	11(2.2)
Occupational status	Unemployed	25(5)
	Unskilled worker	211(42.2)
	Semi-skilled worker	167(33.4)
	Skilled worker	61(12.2)
	Clerical, shop owner, farmer	27(5.4)
	Semi profession and profession	9(1.8)

Socio-Economic Status (Modified Kuppusamy classification)	Upper Middle	46(9.2)
	Lower Middle	94(18.8)
	Upper Lower	347(69.4)
	Lower	13(2.6)
Body Mass Index	Underweight	8(1.6)
	Normal	314(62.8)
	Overweight	135(27)
	Obese	43(8.6)

Only 3.6% of the study population were aware about the complications of diabetes mellitus. They got awareness mostly from the health professionals (88.7%) followed by friends and relatives. Gender wise distribution of the various self-care and life style practices by study population are given in Table 2. Adherence and non-adherence rate for self-practices were given in Figure 1. Non adherence rate was higher to diet (81%) followed by foot care (69.6%) and physical activity (68.8%). Most common reason for non-adherence is lack of knowledge. Various reasons for non-adherence are given in Table 3.

Table 2: Gender wise distribution of life style and self-care practices among the study population (N = 500)

| SELF CARE PRACTICES		MALE (n=105) (%)	FEMALE (n=395) (%)	TOTAL (%)
Diet	Not aware	80(76.2)	307(77.8)	387(77.4)
	Following	21(20)	74(19)	95(19)
	Conscious	4(3.8)	13(3)	17(3.4)
	No attention	0(0)	1(0.2)	1(0.2)
Blood sugar monitoring	Once in six months	69(66)	330(84)	399(79.8)
	As needed	36(34)	65(16)	101(20.2))
Physical activity ≥30 minutes/day for 4 days/week	Doing exercise	43(41)	113(29)	156(31.2)
	Not doing exercise	62(59)	282(71)	344(68.8)
Foot care	Inspection of foot	Yes	26(25)	126(32)	152(30.4)
		No	79(75)	269(68)	348(69.6)
	Wash and drying of foot	Yes	62(59)	209(53)	271(54.2)
		No	43(41)	186(47)	229(45.8)
	Applying oil or moisturisers	Used	17(16)	42(11)	59(11.8)
		Not used	88(84)	353(89)	441(88.2)
	Use of footwear	Using	105(100)	391(99)	496(99.2)
		Not using	0(0)	4(1)	4(0.8)
	Nail trimming	No	7(7)	34(9)	41(8.2)
		With nail cutter	77(73)	222(56)	299(59.8)
		With blade	21(20)	139(35)	160(32)
Regular intake of medications	Regular	102(97)	389(98)	491(98.2)
	Not regular	3(3)	6(2)	9(1.8)
Medical check up	Once in month	7(7)	14(3.5)	21(4.2)
	Once in 6 months	91(86)	368(93)	459(91.8)
	Once in a year	0(0)	5(1.3)	5(1)
	Only when sick	7(7)	8(2.2)	15(3)
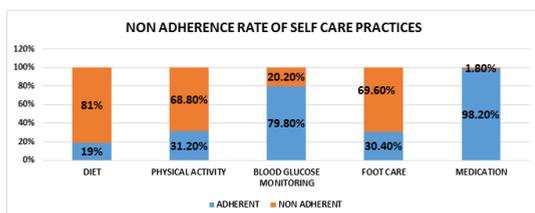
Figure 1: Showing adherence and non-adherence rate of self-care practices (N=500)

Table 3: Various reasons for non-adherence to life style and self-care practices (N=500)

Reasons	Diet (%)	Physical activity (%)	Blood glucose monitoring* (%)	Foot Care* (%)	Medications (%)
Lack of knowledge	336(82.9)	82(23.8)	49(48.5)	309(88.8)	-
Poor family support	11(2.8)	-	16(15.8)	-	1(11.2)
Financial stress	3(0.7)	-	2(2)	-	0(0)
Intentional	14(3.5)	-	9(8.9)	-	-
Busy working hours	41(10.1)	108(31.4)	33(32.7)	47(13.5)	3(33.3)
Mental stress	-	6(1.8)	-	-	-
Pain and discomfort	-	148(43)	-	-	-
Laziness	-	-	-	2(0.6)	-
Forget to take on time	-	-	-	-	2(22.2)
Unpleasant side effects	-	-	-	-	3(33.3)
Lack of results	-	-	-	-	0(0)

*Multiple response

Table 4: Association of adherence pattern with socio-demographic characteristics: (N =500)

Variable		Adherent	Non adherent	Chi-square Value	p-Value
Sex	Diet adherence				
	Male	21(20)	84(80)	0.09	0.78
	Female	74(18.7)	321(81.3)		
	Physical activity				
	Male	43(41)	62(59)	5.89	0.01
	Female	113(28.6)	282(71.4)		
	Blood sugar				
	Male	69(65.7)	36(34.3)	16.36	0.00
	Female	330(83.5)	65(16.5)		
Educational status	Diet adherence				
	Illiterate	14(9.6)	131(90.4)	11.59	0.00
	Literate	81(22.8)	274(77.2)		
	Physical activity				
	Illiterate	34(23.4)	111(76.6)	5.72	0.01
	Literate	122(34.4)	233(65.6)		
	Blood sugar				

	Illiterate	123(84.8)	22(15.2)	3.2	0.07
	Literate	276(77.7)	79(22.3)		
	Foot care				
	Illiterate	34(23.4)	111(76.6)	4.66	0.03
	Literate	118(33.2)	237(66.8)		
Socio Economic Status (Modified Kuppusamy classification)	**Diet adherence**				
	Upper middle	16(34.8)	30(65.2)	13.29	0.04
	Lower middle	24(25.5)	70(74.5)		
	Upper lower	53(15.3)	294(84.7)		
	Lower	2(15.4)	11(84.6)		
	Physical activity				
	Upper middle	28(60.9)	18(39.1)	27.46	0.00
	Lower middle	36(38.3)	58(61.7)		
	Upper lower	87(25.1)	260(74.9)		
	Lower	5(38.5)	8(61.5)		
	Foot care				
	Upper middle	17(37)	29(63)	28.63	0.00
	Lower middle	38(40.4)	56(59.6)		
	Upper lower	86(24.8)	261(75.2)		
	Lower	11(84.6)	2(15.4)		

P value <0.05 considered as significant

No association found between age, marital status, occupation and self-care practices. Others associations were given in table 4.

Table 5: Regression analysis of self-care practices with associated variables:

Variable	B	S.E	Wald	df	Sig.	Exp(B)	CI
Diet adherence							
Sex	-0.21	0.29	0.54	1	0.46	0.81	0.46 – 1.43
Education	-0.24	0.11	5.16	1	0.02	0.78	0.64 – 0.98
Socio-Economic Status	0.31	0.19	2.61	1	0.11	1.36	0.94 – 1.99
Physical activity							
Sex	0.27	0.24	1.31	1	0.25	1.32	0.82 – 2.11
Education	-0.22	0.09	5.75	1	0.02	0.80	0.66 – 0.96
Socio-Economic Status	0.37	0.17	4.88	1	0.03	1.45	1.04 – 2.03
Blood sugar monitoring							
Sex	-0.96	0.26	14.14	1	0.00	0.38	0.23 – 0.63
Education	0.09	0.11	0.69	1	0.41	1.09	0.89 – 1.35
Socio-Economic Status	0.13	0.20	0.42	1	0.52	1.14	0.77 – 1.70
Foot care							
Sex	-0.58	0.26	4.77	1	0.03	0.56	0.33 – 0.94
Education	-0.39	0.09	17.24	1	0.00	0.67	0.56 – 0.81
Socio-Economic Status	-0.18	0.18	1.04	1	0.31	0.83	0.59 – 1.18

CI – Confidence Interval

DISCUSSION:
This was a preliminary study that explored the prevalence of non-adherence to life style and self-care practices among diabetic patients and various reasons for non-adherence. The results of this study shows that non adherence to diet was 81% found to be high when compared to study by Divya, et al[5](59.75%) and Shrivastava, et al[7](45.5%). Consistent results reported in study by Sharma, et al[8](76.7%) and Parajuli, et al[8](87.5%). Most common reason found in these study was lack of knowledge (83.37%) followed by busy working hours. Association between diet and education, occupation and socio-economic status was statistically significant. This could be due to non-adherence was high among illiterate (82.07%) when compared to post high school (54.55%) and graduates (45.64%) in our study. Results alarms the need for enhancement of education regarding diet plan should be more concentrated among people with low educational status.

Non adherence to physical activity was 68.8% consistent with the study by Divya, et al[5](63.45%) and Shrivastava, et al[7](70.7%) and higher when compared to study by Kalaiselvi, et al[3](49.4%), Parajuli, et al[9](42.1%) and Saleh, et al[10](33.2%). Most common reason found in our study was pain and discomfort (43.27%) followed by busy work hours (31.56%) and lack of knowledge (23.97%). But in study by Saleh, et al[9] also main reason was pain and discomfort (72.8%) and problem in mobility (50.4%)

Non-adherence to foot care was 69.6% better when compared to study by Shrivastava, et al[7](82.5%) and higher than study by Kalaiselvi, et al[3](35 -57%) and Saleh, et al[10](43.2%). In our study only 0.8% were not wearing footwear and 17.5% in study by Shrivastava, et al[7]. 54.2% ,11.4%, 91.8% were regularly wash and drying their foot, applying oil or mositurisers and trimming their nails respectively. Common reasons for non-adherence found were lack of knowledge (86.3%), busy working hours (13.1%) and laziness (0.5%).

In our study non-adherence to blood glucose monitoring was 20.2% consistent with study by Kalaiselvi, et al[3](22%) and Shrivastava, et al[7](23.8%) and better when compared to study by Saleh, et al[10](37%). Reason fount found out was lack of knowledge (44.9%) followed by busy working hours (30.27%), poor family support (14.68%). 92% of the patients regularly done health check-up once in 6 months better than study by Sharadha, et al[11] (74.54%).

Non-adherence to medications was (1.8%) comparable with study by Kalaiselvi, et al[3](4.4%) and better results when compared to the study by Praveen, et al[12](37%), Gundala, et al[13](29.5%). Most common reason for non-adherence were unpleasant side effects (33.3%), busy working hours (33.3%) and forgetting to take medicines (22.2%). In study by Praveen, et al[12] forgetting (10.5%), side effects (22.8%) and in study by gelaw, et al[14] forgetting (21,8%) were the reasons for non-adherence to medications.

CONCLUSIONS:
Diabetes mellitus is a chronic disorder requires multifactorial therapeutic interventions including dietary and lifestyle modifications. Patients adherence to these interventions is the mainstay requirement to achieve effective glycemic control and to prevent complications of diabetes. Though results of this study shows that adherence to medications were high, adherence to diet, physical activity and foot care were not satisfactory. Lack of knowledge is the most common reason for non-adherence to diet, foot care in our study. Adherence can be improved by patient's education, strengthen the doctor-patient's relationship, motivation and behavioural change communications.

RECOMMENDATIONS:
Adequate and clear information regarding self-care and lifestyle modifications for diabetes and its effectiveness in controlling blood sugar levels and prevent diabetic complications should be provided to all diabetic patients as factors causing non-adherence in our study are modifiable. The role of health professionals should be considerable to provide continuous health education and motivation of patients to practice self-care thereby strengthening patient-doctor relationship.

LIMITATONS:
This study did not report the effect of self-practices on glycemic control. Although we assessed the various reasons for non-adherence, some other factors like patient's quality of life, patient health beliefs, psychological factors and others need to be incorporated in the further study.

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