Original Article

Compliance to Treatment Regimen among Patients with Diabetes attending out Patient Department of a Referral Hospital in Kathmandu

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Abstract

Diabetes is a chronic metabolic disorder which causes significant morbidity and mortality throughout the world. Control and prevention of complications is mainly based on patients' compliance to treatment regimen which includes life-style modification. This study was aimed to assess the level of compliance and its association with selected variables. A descriptive cross-sectional design was adopted to conduct the study among 203 diabetic patients in Tribhuvan University Teaching Hospital in specific areas: Medication, Exercise, Follow up and Diet. Data were collected using purposive sampling technique through semi-structured interview schedule and were analyzed by using the descriptive statistic (frequency, percentage, mean and standard deviation) and inferential statistic (chi-square).

This study revealed that the medicine compliance levels for good, fair and poor compliance were 62.1%, 31.5% and 6.4% respectively. Similarly the exercise compliance levels were 31.5%, 39.4% and 29.1%and the follow-up compliance were 65.5%, 5.9% and 28.6%. The dietary compliance levels were 77.3%, 21.7% and 1.0% for good, fair and poor respectively. Compliance to medicine was associated with educational status (p=0.040) and the area of residence (p=0.023). Compliance to follow up was associated with diabetic counseling (p=0.028%). Dietary compliance was associated with family income (p=0.035) and dietary counseling (p=0.001).

The study concluded that the respondents who had enough monthly income and received dietary counseling had good compliance in diet. Those who received diabetic counseling also had good compliance in follow up. The findings suggest that blood sugar can be controlled by enhancing compliance in diabetic treatment regimen. Thus it is strongly recommended that the need of proper counseling regarding diet, medicine, exercise and follow up in all health care setting for patients with diabetes.

Key words: Compliance, Diabetes, Treatment Regimen.

Introduction

Diabetes is a condition primarily defined by the level of hyperglycaemia giving rise to risk of microvascular damage (retinopathy, nephropathy and neuropathy). It is associated with reduced life expectancy, significant morbidity due to specific diabetes related microvascular complications, increased risk of macrovascular complications (ischaemic heart disease, stroke and peripheral vascular disease), and diminished quality of life (Abebe, Berhane, & Worku, 2014).

According to the World Health Organization, the global prevalence of diabetes was estimated to be 9% among adults above 18 years. In 2012, an estimated 1.5 million deaths were directly linked to diabetes. More than 80% of diabetes deaths occur in low- and middle-income countries. WHO projects that diabetes will rise as 7th leading cause of death in 2030(World Health Organization, 2014).

The prevalence of diabetes mellitus is growing rapidly worldwide and is reaching epidemic proportions. It is estimated that there are currently 285 million people with diabetes worldwide and this number is set to increase to 438 million by the year 2030 (Anjana et al., 2011).

In the world 387 million people have diabetes and 75 million people in the South East Asian Region; by 2035 this will rise to 123 million. There were 700,000 cases of diabetes in Nepal in 2014 (International Diabetes Federation, 2014).

In Nepal, the incidence of diabetes and impaired fasting glycemia was found to be 14.6% and 9.1%, respectively, in people aged <20 years, in urban 2.5% and 1.3% in rural areas(Singh & Bhattarai, 2003).

Adherence is a primary determinant of the effectiveness of treatment because poor adherence attenuates optimum clinical benefit and paves the way for complications (Rao, Kamath, Shetty, & Kamath, 2014).

The low compliance is reflected in high prevalence of obesity, DM complications, and high blood sugar levels. Therefore, patient compliance needs to be improved through patient teaching program especially targeting vulnerable diabetic patients and their families. Additionally, the barriers perceived by these patients need to be addressed, especially the costs of investigations, and the physical barriers related to diet and exercise (Taha, EL-Azeaz, & EL-Razik, 2011).

Various studies had shown compliance rates for long-term medication therapies was between 40% and 50% while compliance for short-term therapy was much higher at between 70% and 80%, and the compliance with lifestyle changes was the lowest at 20%–30% ((Banu, Prasanth, & Anjana, 2014).

So many scientific evidence exists that lifestyle change prevent or delays the occurrence of complications which includes dietary pattern, regular physical exercise, administration of medication and regular follow-up. So it is necessary for the health professional to be aware of patients' compliance to the treatment regimen which will help them to take measures for further improvement in this area. So the researcher is interested to carry out the study to assess the compliance to treatment regimen among patients with type 2 diabetes.

Research Methodology

The cross-sectional descriptive study design was used to find out Compliance to Diabetic Treatment Regimen.

Diabetic out Patient Department (OPD) of TUTH, Maharajgunj Kathmandu was the study area. The study population was the patients under the treatment of type2 DM.

Data was collected after getting approval from Institutional Review Board of Institute of Medicine. Formal permission was obtained from Authority of TU Teaching Hospital, Maharajgunj, and Kathmandu by submitting written request letter. Data collection was done within the period of 4 weeks (From 5th September, 2014 to 4th October, 2014)

Informed written consent was obtained from the subjects prior to data collection. The respondents were assured voluntary participation and also assured that the individual identity would not be disclosed in the report and the information would be used for study purpose.

Data were analyzed on the basis of research objectives and research questions. The collected data were checked and organized for the completeness and consistency. The collected data were edited, organized, coded and entered in Statistical Package for Social Science (SPSS) version 16.

Since non probability purposive random sampling was adopted to collect the data using structured interview schedule. Total number of sample were calculated on the basis of prevalence of dietary compliance (76%). Non-parametric test (frequency, percentage, mean, standard deviation and inferential statistics namely Pearson Chi square and Linear by Linear association) were used for data analysis)

Results

The results are displayed in various tables. Regarding socio demographic characteristics, average age of the respondents was 55.75±12.25. Nearly one third (32.5%) of the respondents lie in the age group 50-60. More than half (50.2%) of the respondents were female and majority (91.1%) were married. More than half (65.5%) of the respondents belonged to upper caste groups. More than one fourth (27.1%) of the respondents had secondary level education whereas only 15.3% of the respondents had only primary education.(Table1)

According to study finding's more than half (62.1%) of the respondents had good Medicine compliance, nearly one third (31.5%) had good Exercise compliance. Nearly two third (65.5%) had good follow up compliance and more than three fourth (77.3%) of the respondents had good Dietary compliance (Table2)

Study findings shows Illiterate respondents (75.8%) had good compliance which was statistically significant (p=0.040). Regarding the area of residence and medicine compliance, respondents from municipality (68.1%) had good compliance. which was statistically significant (p=0.023) (Table3).

Those respondents who received diabetic counseling had good follow up compliance (72.0%), which was statistically significant (p=0.028). There was no significant association of duration of diagnosis and family history of diabetes with Follow up compliance. (Table 4)

Shows association of socio-demographic characteristics with dietary compliance. The respondent who had family income more than enough for monthly expenditure had Good dietary compliance (90.2%) which was statistically significant (p=0.035). (Table5) regarding association of personal and service related factors with diet compliance, respondents who received dietary counseling had good compliance to diet (86.7 which was statistically significant (p=0.001). There was no significant association of duration of diagnosis, family history of diabetes and diabetic counseling with diet compliance. (Table6)

Table1: Socio Demographic Information (Age, Sex, Marital Status, Ethnicity, Educational Level) of the Respondents

n=203

Socio Demographic Characteristics	Number	Percent
Age (Years)		
≤40 years	25	12.3
41 to 50	42	20.7
51 to 60	66	32.5
61 to 70	41	20.2
>70	29	14.3
Mean±SD: 55.75±12.25		
Sex		
Male	101	49.8
Female	102	50.2
Marital status		
Unmarried	1	0.5
Married	185	91.1
Widow/Widower	17	8.4
Ethnicity		
Dalit	4	2.0
Disadvantaged Janajatis	27	13.3
Disadvantaged Non Dalit Terai caste group	3	1.5
Religious Minorities	3	1.5
Relatively Advantaged Janajatis	33	16.3
Upper caste groups	133	65.5
Education		
Illiterate	33	16.3
Able to read and write	51	25.1
Primary Education	31	15.3
Service	38	18.7
Retired	28	13.8
Others (Agriculture, Student)	20	9.9
Monthly family income		
Not enough for monthly expenditure	22	10.8
Enough for monthly expen-diture	120	59.1
More than enough for monthly expenditure	61	30.0
Area of residence		
Municipality	138	68.0
VDC	65	32.0

Table 2 : Level of Compliance on Treatment Regimen of the Respondents

n= 203

	Level of Compliance		
	Good Compliance	**Fair Compliance**	**Poor Compliance**
Medicine Compliance	126 (62.1%)	64 (31.5%)	13 (6.4%)
Exercise Compliance	64 (31.5%)	80 (39.4%)	59 (29.1%)
Follow up Compliance	133 (65.5%)	12 (5.9%)	58 (28.6%)
Dietary Compliance	157 (77.3%)	44 (21.7%)	2 (1.0%)

Table 3 : Association of Socio Demographic Characteristics with Medicine Compliance

n= 203

	Level of Compliance			Total	χ^2 Value	*P* Value
	Good Compliance	**Fair Compliance**	**Poor Compliance**			
Age						
≤40years	16 (64.0%)	7 (28.0%)	2 (8.0%)	25		
41 to 60 years	59 (54.6%)	39 (36.1%)	10 (9.3%)	108	3.744	0.053[b]
61 years and above	51 (72.9%)	18 (25.7%)	1 (1.4%)	70		
Sex						
Male	57 (56.4%)	37 (36.6%)	7 (6.9%)	101	2.777	0.249 [a]
Female	69 (67.6%)	27 (26.5%)	6 (5.9%)	102		
Education						
Illiterate	25 (75.8%)	8 (24.2%)	-	33	4.223	0.040*[b]
Literate	101 (59.4%)	56 (32.9%)	13 (7.6%)	170		
Area of residence						
Municipality	94 (68.1%)	38 (27.5%)	6 (4.3%)	138	7.561	0.023*[a]
VDC	32 (49.2%)	26 (40.0%)	7 (10.8%)	65		
Family Income						
Not enough for monthly expenditure	9 (40.9%)	11 (50.0%)	2 (9.1%)	22		
Enough for monthly expenditure	74 (61.7%)	39 (32.5%)	7 (5.8%)	120	3.723	0.054[b]
More than enough for monthly expenditure	43 (70.5%)	14 (23.0%)	4 (6.6%)	61		

a: Pearson's Chi square test b: Linear by linear Association

*: *p*value significant at ≤0.0

Table 4 : Association of Personal and Service related Factors with Follow up Compliance

n= 203

	Level of Follow up Compliance			Total	χ^2 value	*P* value
	Good Compliance	Fair Compliance	Poor Complance			
Duration of Diagnosis						
<6 years	63(61.8%)	5(4.9%)	34(33.3%)	102	2.421	0.298
≥6 years	70(69.3%)	7(6.9%)	24(23.8%)	101		
Family History of diabetes						
Yes	56(65.9%)	7(8.2%)	22(25.9%)	85	1.709	0.425
No	77(65.3%)	5(4.2%)	36(30.5%)	118		
Diabetic Counseling						
Yes	95(72.0%)	7(5.3%)	30(22.7%)	132	7.146	0.028*
No	38(53.5%)	5(7.0%)	28(39.4%)	71		

Test Statistics: Pearson's Chi square test*: *p*value significant at ≤0.05

Table 5 : Association of Socio Demographic Characteristics with Dietary Compliance

n= 203

	Level of Diet Compliance			Total	χ^2 value	*p* value
	Good Compliance	Fair Compliance	Poor Compliance			
Age						
Up to 40 years	18 (72%)	7 (28%)	0 (0%)	25	0.775	0.379
41 to 60 years	82 (75.9%)	25 (23.1%)	1 (0.9%)	108		
61 years and above	57 (81.4%)	44 (21.7%)	2 (1%)	70		
Sex						
Male	78(77.2%)	22(21.8%)	1(1.0%)	101	0.001	0.097
Female	79(77.5%)	22(21.6%)	1(1.0%)	102		
Education						
Illiterate	25(75.8%)	8(24.2%)	-	33	0.007	0.933
Literate	132(77.6%)	36(21.2%)	2(1.0%)	170		
Area of residence						
Municipality	110(79.7%)	27(19.6%)	1(0.7%)	138	1.482	0.22
VDC	47(72.6%)	17(26.2%)	1(1.5%)	65		
Family Income						
Not enough for monthly expenditure	18(81.8%)	3(13.6%)	1(4.5%)	22	4.449	0.035*
Enough for monthly expenditure	84(70.0%)	35(29.2%)	1(0.8%)	120		
More than enough for monthly expenditure	55(90.2%)	6(9.8%)	-	61		

Test Statistics: Linear by linear Association *: *p*value significant at ≤0.05

Table 6: Association of Personal and Service related Factors with Diet Compliance

n= 203

	Level of Diet Compliance			Total	$\chi 2$ value	*p* value
	Good Compliance	Fair Compliance	Poor Compliance			
Duration of Diagnosis						
<6 years	83(81.4%)	18(17.6%)	1(1.0%)	102	1.661	0.198
≥6 years	74(73.3%)	26(25.7%)	1(1.0%)	101		
Family History of diabetes						
Yes	72(84.7%)	12(14.1%)	1(1.2%)	85	3.741	0.053
No	85(72.0%)	32(27.1%)	1(0.8%)	118		
Diabetic Counseling						
Yes	104(78.8%)	26(19.7%)	2(1.5%)	132	0.158	0.691
No	53(74.6%)	18(25.4)	-	71		
Dietary Counseling						
Yes	85(86.7%)	13(13.3%)	-	98	10.144	0.001*
No	72(68.6%)	31(29.5%)	2(1.9%)	105		

Test Statistics: Linear by linear Association*: *p*value significant at ≤0.05

Discussion

Medicine Compliance

Present study showed62.1% of the respondents had good medicine compliance while 31.5% had fair and 6.4% had poor compliance t. Similarly, the study of India revealed that 40.95% had good adherence with prescribed medications, whereas 37.14% had medium adherence and 21.90 % had low adherence which is consistent with this study(Sajith, Pankaj, Pawar, Modi, & Sumariya, 2014).

In this study female respondents (67.6%) had good compliance than male which is consistent with the study conducted in Nepalgunj revealed better compliance in female respondents (54.4%) this could bean increased awareness of the illness and better modulation to comply with treatment, besides this female patients have not busy schedule so they are more comply than male (Thapa et al., 2013).

In this study, almost 73% of the elderly had good compliance. This finding is supported by the studies conducted in India and Egypt, which showed that46.8% and 68.0% of elderly had good compliance to medicine respectively.(Sajith et al., 2014; SanderBorgsteede et al., 2011).

In another study, good adherence was found in young aged group with (51.0%) and low adherence was found in elderly and middle age group which is contradictory to current study. This could be the reason of busy working schedule of younger aged group and may be the different setting and different instrument was used to measure compliance(Shams & Barakat, 2010).

The present study reflects that (75.8%) illiterate respondent had good compliance which is statistically significant. This result is consistent with other study conducted in Malaysia had also higher compliance (57.4%) in illiterate respondent. This result is contradictory to the study which is done in Egypt and BPKIHS which revels 43.9% 68.3% had good compliance with higher education level respectively(Shams & Barakat, 2010; Thapa et al., 2013). This may be the reason of different setting and different instrument used to measure the compliance.

Present study revealed that 68.1% respondent of municipality had good medicine compliance compare to VDC (49.2%), which is consistent with the study conducted in Egypt where good adherence was 41.9% in urban and 34.4% in rural area . Similar study conducted by Sajith et al. (2014)revealed that 42.86% respondents of rural area had shown higher rate of adherence compared to respondents of urban area 37.14%, which is contradictory to the present study. The higher prevalence to medicine compliance in patients of municipality in the present study may be due to easy access, literate, impact of media and good economic status.

Exercise Compliance

The present study showed that the respondents (39.4%) had fair exercise compliance followed by 31.5% with good exercise compliance and 29.1% respondents with poor compliance to exercise. A similar study conducted among Nepalese type 2 diabetes patients by Parajuli et al. (2014) showed that the respondent (42.1%) had non-compliance to exercise, while 36.6% had poor exercise compliance, and 21% had good compliance to exercise which is contradictory to current study. Good exercise adherence was found to be 32.29% which is consistent with present study(Sajith et al., 2014).

Exercise adherence level was higher in the respondents with positive family history of diabetes (65.9%) as com-pared to those with no family history which is consistent with the study conducted by Parajuli et al. (2014).

Follow up Compliance

Inthisstudynearlytwothird(65.5%)oftherespondents had good compliance with follow up, where as 5.9% had fair and 28.6% had poor compliance. Males and females compliance ratio are almost similar which is 64.4% and 66.7% respectively. The study of Iraq revealed that 36.7% had good compliance with follow up, where as 24.7% had medium and 38.7 % had poor compliance. Males had relatively better compliance with follow up than females, which is contradictory to this study(Lafta et al., 2009). In respect to the compliance with follow up, security and cultural belief of Iraqi people led to restriction of female patients' movement, this may explain the low percentage of respondents with good compliance to follow up in female respondents.

Dietary compliance

The present study revealed that more than three fourth (77.3%) of the respondents had good dietary compliance, 21.7% had fair compliance and 1.0% had poor compliance. While a study conducted in Iraq showed that 36% respondents had good compliance and 50% and 14% had medium and poor compliance respectively(Lafta et al., 2009). In a similar study conducted in Nepalgunj showed, good adherence in diet was 0% while poor adherence 12.5% and non-adherence 87.5% among the Nepalese type 2 diabetes patients (Parajuli et al., 2014). The findings of these two studies are contradictory to the present study. The inconsistency in the findings may be due to the dissimilarity in the life style of the respondents, knowledge about diabetic diet, dietary counseling and different setting.

Females and males had relatively similar levels of compliance with diet (37.7%) and(34.0%) respectively. Regarding the age, more compliance was seen in the age group 40-49 years (38.2%) than the respondents with age group 30-39 year. No significant statistical association was found with sex and age (Laftaet al., 2009).These findings are consistent with the present study findings which showed that males and females had similar level of compliance 77.2% and 77.5% respectively. sex and age.

In the present study good dietary compliance was found more (81.4%) in the respondents those who had short duration of diagnosis (<6 years) than the respondents having duration of diagnosis ≥ 6 years (73.3%). This finding is similar with the finding of Parajuli et al. (2014)which reported that, with increasing duration of disease degree of adherence was decreasing..

Respondents with family income more than

enough for monthly expenditure had Good dietary compliance (90.2%) which is statistically significant (p=0.035). Similarly respondents receiving dietary counseling had good compliance to diet (86.7%) which is statistically significant (p=0.001). There was no supportive literature found to compare these findings.

5.2 Conclusion

Based on study findings it can be concluded that in diabetic treatment regimen compliance on diet was good in comparison with other aspects. Enough family income, having dietary counseling had good diet compliance.. So dietary counseling in all health care setting and clients with low family income need to focus to enhance the dietary compliance. Those who received diabetic counseling had more good compliance in followup. So it is recommended that diabetic counseling including diet counseling is more important to treatment compliance for the patients with type 2 diabetes. Thus proper counseling in all health care setting is needed for diabetic patients

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