Compliance on Diet and Exercise among Diabetic Patient in Referral Hospital of Morang District.

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ABSTRACT

Diabetes is a serious health problem that threatens the quality of life of with diabetes, the success of long term maintenance therapy for diabetes depends largely on the patient compliance with diet and exercise. Thus, this study aim to assess the compliance on Diet and Exercise among diabetic patient in a Referral Hospital of Morang District.

Methodology: A cross sectional descriptive study was conducted among type 2 diabetic patient in medical OPD of Koshi Hospital through face to face interview Data were organized, verified and analyzed using the Statistical Package for Social Sciences, version 17.

Results: A total of 141 participants were included in this study, of them 55.3% were males. The rate of compliance to diet and exercise was 48.2% and 22.7%, respectively. Compliance to diet was higher in people of age above 50 years (p=0.029) and those who are single (p=0.037), patient with duration of diagnosis less than 5 years (p=0.01) and those who had dietary counselling (p=0.007). The rate of compliance to exercise among type-2 diabetes patients in Morang district was low, and it could be attributed to a combination of several socio-demographic and clinical factors.

KEYWORDS

Compliance, Diabetic patient, Diet and exercise

INTRODUCTION

Diabetes is a chronic, metabolic disease characterized by elevated levels of blood glucose (or blood sugar), which leads over time to serious damage to the heart, blood vessels, eyes, kidneys, and nerves. The most common is type two diabetes, usually in adults, which occurs when the body becomes resistant to insulin or does not make enough insulin. In the past three decades, the prevalence of type two diabetes has risen dramatically in countries of all income levels (WHO, 2016). Compliance is the extent to which a person behavior coincides with medical advice, assessment of the compliance depends on the reported adherence to prescribed dietary behavior (Mahfouz & Awadalla, 2011).

According to WHO the global prevalence of diabetes was estimated 8.8% of adult population worldwide and projects to rise to nine percent by the year 2045 (WHO 2017) .WHO projects that the diabetes will be seventh leading cause of death in 2030 (World Health Organization 2014).

The prevalence of diabetes in South East Asia is 8.5% where the highest prevalence is seen in India with 8.8% (Ramachandran, Chamukuttan, Samith Shetty, & Nanditha, 2012).

According to WHO diabetes mellitus death in Nepal reached 6,482 of total death. The age adjusted death rate is 33.25%per 100,000 of population and Nepal ranks 77 in the world (World Life expectancy 2017).

Diet and exercise are considered important component of the treatment and tertiary prevention in type 2 diabetes, dietary and physical activity changes to produce a 5-7%weight loss successfully maintain glycemic control in people diagnosed with type 2 diabetes .(International Diabetes Federation, 2017).

In Nepal prevalence of compliance on diet and exercise among 197 diabetic patient in outpatient department (OPD) of the Diabetes, Thyroid & Endocrinology Care Centre (DTECC) in Kupondole, Nepal was 35.5% (Ghimire, 2017).

According to WHO healthy diet and regular exercise can prevent or delay the onset of type 2 diabetes (Alwan, 2011).

Diabetes is a major lifestyle disorder, the prevalence of which is increasing globally, the patient does more than 95% of diabetes care and health professionals have a very little control over how patient manage their illness. Diet and exercise is major contributing factor in prevention of complication of diabetes, compliance of diet and exercise does not met the goal as the others compliance factors in treatment of diabetes (Forouhi, & Wareham, 2014).

Hence, this study aims to assess the compliance on diet and exercise among diabetic patient in a referral hospital of Nepal.

Materials and methodology

Study Design and setting

A cross sectional study was conucted , among type 2 diabetic patient's at the outpatient department(OPD) of Koshi hospital, Biratnagar Nepal.

Koshi hospital lies 399km east of Nepal's capital Kathmandu, and 6km north of border of India state Bihar. It has 17 departments all together and provides preventive, curative and promotive services to the public. This hospital is one of the referral center of Morang district, with good patient flow of diabetes.

Sampling

The sample size of 141 individuals was calculated using Cochran's formula with 5% alpha or Type I error, 5% margin of error, and adjusting to finite population in OPD and 35% prevalence of diabetes in urban Nepal (Ghimire,2017). Non Probability Purposive sampling was used for selecting samples.

Ethical Approval and Consent to participate

The Ethical Review Board of the Tribhuvan University granted ethical approval for this study. Permission was also obtained from Koshi hospital Biratnagar. Informed written consent was taken from each respondent, participating voluntarily. The identity of participants was kept confidential.

Instrumentation

The research instrument has three parts:

Part I consist of 13 question which include 9 question related to sociodemographic and 4 question related to service related factors. Part I question will be coded as (D1-D10) and service related factors are coded as (S1-S4)

Part II consist of question related general physical activities questionnaire The Global Physical Activity Questionnaire was developed by WHO for physical activity surveillance in countries. It collects information on physical activity participation in three settings (or domains) as well as sedentary behavior, comprising 16 questions (P1-P16).

The global physical activities questionnaire consist of

Activity at work P1-P6

Travel to and from places: P7-P9

Recreational activities: P10-P15

Part III consist of question related to compliance on diet. It consist of behavioral question related to compliance on diet. It consist of 5 question and coded as C1-C5.

Participants

Eligible Participants. (i) They were at least 18 years old; (ii) diagnosed with T2DM for 1 year (iii) had received advice from their consultants to follow a special diet appropriate for diabetes patients and to perform exercises; and (iv) had an OPD card (local medical record) that reflected their disease status and previous consultations.

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Patient's diabetic status and other eligibility criteria were confirmed by their OPD card. Patients with thyroid, endocrine, and other severe systemic comorbidities that could limit their dietary options and exercise activity were excluded. Pregnant women and physically disabled patients were excluded.

Data Collection

Data was collected by individual interview method . The average time taken to complete the interview were approximately 20-25 minutes. Privacy was maintained while conducting interview.

Statistics Analysis

After the completion of the data, data were checked for its completeness and accuracy. The obtained data were edited, coded and entered on the same day. Data was entered into the computer using the software Epi-data version 3.1 and transferred into Statistical Package for Social Science (SPSS-16 version) for further analysis. Data were analyzed and interpreted according to the objectives of the study and research questions. Both descriptive and inferential statistics were used to analyze the data. Descriptive statistics (frequency, percentage, mean and standard deviation) were be used to describe the socio-demographic characteristics, service related factors and the inferential statistics (chi-square test, odds ratio) were used to find out the association between compliance on diet and exercise and selected variables, level of significance was considered at 5% with p value <0.05 and 95% confidence interval.

RESULTS

3.1 Demographic characteristics of participants:

The study included 149 participants with 78 males and 63 females with mean age of 55.2 years. Descriptive characteristics of the participants are provided in Table 1. Nearly one third (33.4) of the respondent lie in age group 51-60 and 14.8% in the age group less than 40 majority of them (79.43%) were married. In concerning to ethnic status 48.23%of the respondent were of upper caste group whereas most of participants 83.69% followed Hindu religion.

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Table 1: Socio Demographic Characteristics of the Respondents

Variables	Number	Percent
Age		
Upto40yrs	21	14.89
41-50 yrs	27	19.15
51-60yrs	47	33.33
Above 60 yrs	46	32.63
Mean $\pm$ SD:55.2$\pm$11.3		
Sex		
Male	78	55.32
Female	63	44.68
Ethnicity		
Dalit	1	.71
Disadvantaged Janjati	5	3.55
Disadvantaged non dalit Terai Caste	17	12.05
Religious minorities	25	17.73
Advantaged janjati	25	17.73
Upper Caste group	68	48.23
Religion		
Hinduism	118	83.69
Buddhist	14	9.93
Muslim	9	6.38
Marital status		
Married	112	79.43
Single	29	20.57

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Sociodemographic Information

Table 2: Type of Family, Education Status, Occupation and Income Status

n =141

Variables	Number	Percent
Type of Family		
Nuclear	60	42.53
Joint	81	57.45
Education status		
Illiterate	25	17.73
Formal Education	20	14.18
Primary	19	13.48
Secondary	29	20.57
Higher secondary completed	35	24.82
Bachelor degree and above	13	9.22
Occupation		
Government	12	8.51
Non-government	6	4.26
Self-employed/Business	45	31.92
Homemaker	49	34.75
Retired	29	20.57
Family Income		
Income sufficient for less than 6 month	23	16.31
Income sufficient for 6-12 month	81	57.45
Income sufficient for more than 12 month and surplus	37	26.24

Table 2 represents that more than half (57.45%)of respondents lived in joint family. Similarly, 24.82 percent of respondents had completed higher secondary school. Likewise 34.75% of them were homemaker and 57.45 percent of respondents have family income sufficient for 6-12 month.

Personal and Service Factors of the Respondents

Only 48.23% of respondents had a family history of diabetes. In concern to duration of diabetes more than half (53.91%) have, duration of diabetes less than 5 year and most of participants (84.40%) had attend diabetic counseling and 57.45% had attended dietary counseling Table 3.

Table 3: Personal and Service Factors of the Respondents

Response	Frequency	Percent
Family History of diabetes		
Yes	68	48.23
No	73	51.77
Duration of Diabetes		
1-5yrs	76	53.91
More than 5 yrs.	65	46.09
Diabetic Counseling		
Yes	119	84.40
No	22	15.60
Dietary Counseling		
Yes	81	57.45
No	60	42.55

Level of Compliance of the Respondents

Table 4 reveals that the level of compliance of respondents. Majority (73%) of the respondents had poor diet compliance. Poor exercise compliance level was seen in 48.94% of respondents and 22.70% were good exercise compliance level

Table 4: Level of Compliance of the Respondents   **n=141**

	Number	Percentage
Diet Compliance Level		
Good	68	48.2
Poor	73	51.8
Exercise Compliance		
Level	32	22.70
Good	40	28.36
Fair	69	48.94
Poor		

Association of Socio Demographic Characteristics with Diet Compliance

Table 5 reveals that respondents 50 years and above were two times higher to be good compliance than the respondents of 30-50years, which is statistically significant (p=0.029, OR=0.45 CI=0.222 -0.927). Married were less likely to be good compliance than single which is statistically significant (p=0.037, OR=0.409.CI=0.175-0.960). However, there was no association of sex, ethnicity, and religion, type of family, education status and family income of the respondents.

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Table 5: Association of Socio Demographic Characteristics with Diet Compliance
n=141

	Level of	Compliance				
	Good Compliance	**Poor Compliance**	**Total**	x^2	**p value**	**OR (95%CI)**
Age						
51 years and above	51 (54.8%)	42(45.2%)	93			
$30-50$ years	17(35.4%)	31(64.6%)	48	4.783	**0.029**	**2.22 (1.08-4.54)**
Sex						
Male	39 (50%)	39(50%)	78	0.22	0.64	1.17
Female	29(46%)	34(54%)	63			(0.60 -2.28)
Ethnicity						
Underprivileged	14 (60.87%)	9(39.13%)	23	1.759	0.185	1.844
Privileged	54(45.76%)	64(54.24%)	118			(0.740 -4.59)
Religion						
Hinduism	49(41.5%)	69(58.5%)	118	0.30	0.862	0.923
Others	10(43.48%)	13 (56.52%)	23			(0.375-2.275)
Marital status						
Married	49(43.75%)	63 (56.25%)	112	4.371	**0.037**	**0.409**
Single	19(65.51%)	10(34.48%)	29			**(0.175-0.960)**
Type of family						
Nuclear	31(51.67%)	29(48.33%)	60	0.50	0.48	1.27
Joint	37(45.68%)	44(54.32%)	81			(0.65-2.48)
Education status						
Literate	56(48.28%)	60(51.72%)	116	0.001	0.98	1.01
Illiterate	12(48%)	13(52%))	25			(0.43- 2.40)
Family Income						
Income sufficient for less than 6 month	14(53.84%)	12(46.15%)	23	4.03	0.525	1.318 (0.561-3.095)
Income sufficient for more than 6 month	54(46.96%)	16(53.04%)	118			

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Association of Personal and Service Related Factors with Dietary Compliance

Table 6 reveals that respondents less than 5 year of duration of diagnosis were less likely to be good compliance than the respondent of more than 5 years duration of diagnosis, which is statistically significant (p=0.01, OR=0.41, CI=0.20-0.81). However respondents with dietary counseling were two times higher good compliance than the respondents without dietary counseling, which is statistically significant (p=0.007, OR=2.56, CI= 1.29-5.12).There was no association of dietary compliance with duration of diagnosis, family history, diabetic counseling of respondents.

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

		Level of Compliance	Total	x^2	p value	OR 95%CI
	Good	**Fair**				
Duration of Diagnosis ≤ 5 years More than 5 years	29(38.16%) 39 (60%)	47(61.84%) 26(40%)	76 65	6.694	**0.01**	**0.41** (0.20-0.81)
Family History Yes No	32(47.06%) 36(49.32%)	36(52.94%) 37(50.68%)	68 73	0.02	0.877	0.95 (0.485-1.853)
Diabetic Counselling Yes No	62(52.1%) 6(27.3%)	57(47.9%) 16(72.7%)	119 22	4.584	0.32	2.9 (0.79-1.06)
Dietary Counselling Yes No	47(58.02%) 21(35%)	34(41.98) 39(65%)	81 60	7.318	**0.007**	**2.56 (1.29-5.12)**

Association of Socio Demographic Characteristics with Exercise Compliance

Table 7 shows that there is no association of age, sex, ethnicity, religion, marital status, education status and family income with exercise compliance level.

Table 7: Association of Socio Demographic Characteristics with Exercise Compliance

Responses	Level of Compliance			Total	x^2	pvalue
	Poor	Fair	Good			
Age						
30 − 50 years	19(39.58%)	14(29.17%)	15(31.25%)	48	3.664	0.16
51 years and above	50(53.76%)	26(27.96%)	17(18.3%)	93		
Sex						
Male	35(44.87%)	26(33.33%)	17(21.8%)	78	2.168	0.338
Female	34(53.97%)	14(22.22%)	15(23.81%)	63		
Ethnicity						
Underprivileged	11(47.83%)	4(17.39%)	8(34.78%)	23	2.944	0.230
	58(49.15%)	36(30.51%)	24(20.34%)	118		
Privileged						
Marital status						
Married	51(45.54%)	33(29.46%)	28(25%)	112	2.79	0.248
Single	18(62.07%)	7(24.14%)	4(13.79%)	29		
Type of family						
Nuclear	26(43.33%)	16(26.67%)	18(30%)	60	3.23	0.199
Joint	43(53.09%)	24(29.63%)	14(17.28%)	81		
Education status						
Literate	52(44.83%)	36(31.03%)	28(24.14%)	116		
Illiterate	17(68%)	4(16%)	4(16%)	25	4.49	0.106
Family Income						
Income sufficient for less than 6 month	13(56.52%)	6(26.09%)	4(17.39%)	23	0.714	0.70
Income sufficient for more than 6 month	56(47.46%)	34(28.81%)	28(23.73%)	118		

Association of Personal and Service Related factors with Exercise compliance

Table 8 represents that there is no significant association of duration of diagnosis, family history and diabetic counseling with exercise level of compliance.

Table 8: Association of Personal and Service Related Factors with Exercise Compliance

	Level of Compliance			Total	x^2	p value
	Poor	**Fair**	**Good**			
Duration of Diagnosis≤ 5 years						
More than 5 years	40(52.63%)	19(25%)	17(22.4%)	76		
	29(44.61%)	21(32.31%)	15(23.08%)	65	1.127	0.56
Family History						
Yes	33(48.53%)	16(23.53%)	19(27.94%)	68		
No	36(49.32%)	24(32.88%)	13(17.81%)	73	2.68	0.26
Diabetic Counseling	57(47.90%)					
	12(54.55%)	31(26.05%)				
Yes		9(40.91%)	31(26.05%)	119		
No			1(4.54%)	22	5.39	0.67

DISCUSSION

Dietary compliance

The present study revealed that 48.2% had good dietary compliance and while a study conducted in Nepalgunj showed that good adherence in diet was 0%, among Nepalese type2 diabetes patient (Parajuli et al., 2014). The inconsistency in the findings may be due to the dissimilarity in lifestyle of the respondents, knowledge about diabetic diet, dietary counselling and different setting.

The present study shows males (50%) and females (46%) had relatively similar level of compliance with diet which is similar to the findings of study done on Compliance of diabetic patient in National Diabetes Center in Baghdad (Lafta et al,.). Regarding the age group good compliance was seen in 54.8% of the respondents with higher age (50years) which is similar to the findings of Kapur et al.,(2008).

Regarding the association of dietary compliance 51.67% of nuclear family had good dietary compliance (χ^2=0.495, p>0.05) which is similar to the study conducted by Parajuli et al.,(2014) showed that nuclear family is more compliance to diet than that of joint and extended(p=0.01).

In present study good dietary compliance was found more (60%)in the respondents with long duration of diagnosis which is contradictory with the study done in Nepalese type 2 diabetic patient (Parajuli et al., 2014) which revealed that with increasing duration of disease degree of compliance was decreased.

Exercise Compliance

The study revealed that good exercise compliance was seen in 22.70% which is similar to the study done on Factors associated with non adherence to diet and physical activity in diabetic patient (Parajuli et al., 2014) which showed good physical activity adherence in 21.3%.

Poor exercise compliance is seen in those without family history which is contrast to the study done in Nepal (Kadariya, S.2018).
Exercise compliance was good in married people than single which is similar to the study done in Nepalese type 2 diabetic patient (Prajuli et al., 2014).

CONCLUSIONS

The study concluded in compliance in diet and exercise, compliance was good on in comparison with exercise aspects. The respondents who are older ages, longer duration of diagnosis and received dietary counseling had good compliance in diet. So dietary counseling in all health care setting are necessary to enhance the dietary compliance. Similarly, exercise compliance was poor in respondents. Likewise male were physically active than female counterpart.

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REFERENCES

Alwan, A. (2011). Global Health status report on Non communicable disease 2010: World Health Organization,2011.

American Diabetes Association (2014). Diagnosing Diabetes and Learning About Prediabetes. Retrived from http://www.diabetes.org/

Aryal, K.K., Mehata, S., Neupane, S., Vaidya, A., Dhimal, M., Dhakal, P., et al. (2015). The Burden and Determinants of Non Communicable Diseases Risk Factors in Nepal: Findings from a Nationwide STEPS Survey. PLoS ONE 10(8): e0134834. doi:10.1371/ journal.pone.0134834

Banu, S., Prasanath,Y., & Anjana, K.(2014). Adherence to treatment among type 2 diabetic patient visiting a tertiary care hospital in Manglore. International Journal Of Biomedical Research,5(4), 254-256. doi:10.7439/ijbr.

Bhandari, G. P., Angdembe, M. R., Dhimal, M., Neupane, S., Bhusal, C.(2014). State of non-communicable diseases in Nepal. *BMC Public Health*., 14(1, article 23) doi: 10.1186/1471-2458-14-23.

Department of Health and Human Services. (2008). *Physical Activity Guidelines for Americans, A1-H14*.Vol. 2008. Washington, DC, USA: Department of Health and Human Services; 2008.

Forouhi,N.G.,& Wareham,N.J. (2014). Epidemiologyofdiabetes. *Medicine, 42* (1), 69 8702. https://doi.org/10.1016/j.mpmed.2014.09.007.

International Diabetes Federation: IDF Diabetes Atlas, 6th edn. International Diabetes Federation; 2018.Retrived from http://www.idf.org/diabetesatlas.

Kadariya, S., & Aro, A. R. (2018). Barriers and facilators to physical activity among urban residents with diabetes in Nepal, plos, one13(6):E0199329 https://doi.org/10.137/journal.

Mahfouz, E., & Awadalla, H. (2011). *Compliance to diabetes self-management in rural El-Mina, Egypt* (Vol. 19).

Nepal Diabetes Association (2016). The prevalence of diabetes in the people 20 years and above. Nepal: Nepal Diabetes Association. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4662667/

Parajuli, J., Saleh, F., Thapa, N., Ali, L. (2014). Factors associated with(Ydav, 2012) nonadherence to diet and physical activity among Nepalese type 2 diabetes patients; a cross sectional study. *BMC Research Notes*. 7 (1, article 758) doi: 10.1186/1756-0500-7-758.

Ramachandran, A., Chamukuttan, S., Samith Shetty, A., & Nanditha, A. (2012). *Trends in prevalence of diabetes in Asian countries* (Vol. 3)

Ghimire, S. (2017). Barriers to Diet and Exercise among Nepalese Type 2 Diabetic Patients. *International Scholarly Research Notices*, *2017*, 1273084. http://doi.org/10.1155/2017/1273084.

Taha, N.M., EL-Azeaz, M. A., & EL-Razik, B. G. A.(2011).Factors affecting compliance of diabetic patients towards therapeutic management. The Medical

Journal of Cairo University, 79(2). Retrived from http://medicaljournalofcairouniversity.net/

Tol, A., Mohebbi, B., & Sadeghi, R. (2014). Evaluation of dietary habits and related factors among type 2 diabetic patients: An innovative study in Iran. *Journal of Education and Health Promotion*, *3*, 4. http://doi.org/10.4103/2277-9531.127548)

World Health Organization (2010). Global status report on non-communicable diseases 2010. 2011,2017Geneva:WorldHealthOrganization.Retrivedfromhttp://www.who.int /nmh/publications/ncd_report2016/en/

APPENDIX A

List of abbreviation

ADA **:** American Diabetic Association

BMI **:** Body Mass Index

CDC **:** Centre for Disease Control

DM : Diabetes Mellitus

FFQ : Food Frequency Questionnaire

GPAQ : General Physical Activity Questionnaire

IDF : International Diabetes Federation

IOM : Institute of Medicine

MET : Metabolic Equivalent Test

OPD : Out Patient Department

OR : Odd ratio

SD : Standard deviation

SPSS : Statistical Package for Social science

TU : Tribhuvan University

WHO : World Health Organization

TUTH **:** Tribhuvan University Teaching Hospital

VDC : Village Development Committee