Original Article

Non-adherence to Lifestyle (Diet and Exercise) Modification Recommendations among the Type 2 Diabetes Mellitus Patients in a Tertiary Level Hospital

Pandey A

Lecturer, Tribhuwan University, Institute of Medicine, Maharajgunj Nursing Campus,

Correspondence author: Apsara Pandey

Email: pkapsara@gmail.com

Abstract

Introduction: Non-adherence to lifestyle recommendations among Type 2 Diabetes Mellitus (DM) patients is a big challenge in management of those patients and increases the risk of serious complications like stroke, heart disease, retinopathy, peripheral nerve damage and renal problems compared to the general population.

Methods: A hospital based**,** descriptive cross-sectional study was conducted to identify non –adherence to life style modification recommendations among 104 type 2 diabetes patients in Kathmandu. Non-probability purposive sampling technique was used. Data were collected through interview by using structured questionnaire. Data were analyzed using SPSS version 16.0.

Results: The mean age of the respondents was 53.8 years (SD±11.0 and 51% were female. The prevalence of non adherence to diet and exercise were 52.9% and 67.3% respectively. The main reasons for non-adherence to diet were lack of family support (50.0%), outside eating habit (31.8%) and poor self control (22.7%). The main reasons for non-adherence to exercise were weather (45.5%), the perception that exercise exacerbated their illness (41.3%) and busy schedule (33.3%). Non-adherence to diet was significantly associated with family support and perception that proper diet plays role in management of diabetes. Non-adherence to exercise was significantly associated with family support, regular health checkup, the perception that exercise exacerbated their illness, received written instruction.

Conclusion: Non-adherence to diet and exercise recommendations was highly prevalent among type 2 DM patients and no single reason could be attributed to non-adherence to both diet and exercise recommendations.

Key words*:* Life style modification; non-adherence; type 2 diabetes mellitus

Introduction

The number of people with diabetes is increasing due to increasing population growth, aging, urbanization and increasing prevalence of obesity and physical inactivity.[1] It is estimated that 422 million adults aged over 18 years were living with diabetes in 2014[2] and the number of people with diabetes ages64+ will be more than 82 million in developing countries by 2030.[1] Diabetes Mellitus affects more than 436000 in Nepal and this number will rise to 1328000 by 2030[3]. Similarly, diabetes death in Nepal reached 2.17% of total deaths[4]. Adherence to lifestyle modification recommendations can lessen the disease burden and reduce the morbidity and mortality associated with type 2 diabetic complications.[5] However, there is very few study concerning adherence to lifestyle modification recommendations among the studied population in Nepal. This study was aimed to examine non-adherence to lifestyle modification recommendations among type 2 diabetes mellitus patients in Kathmandu.

Methods

An institution-based descriptive cross-sectional study design was used to identify non-adherence to lifestyle modification recommendations among type 2 diabetes patients attending a diabetes clinic of Tribhuwan University, Teaching Hospital (TUTH), Kathmandu. It is one of the tertiary level hospital where all services are available for counseling and treatment of diabetes patient. People from different level of the country visits TUTH for treatment. Altogether 104 Type 2 diabetes patients diagnosed at least one year before the study period and who were under clinic care, were selected with non-probability purposive sampling technique. Both male and female adult patients were included in the study.

Data collection was done through face to face interview technique using structured questionnaire. The English version of the questionnaire was translated into Nepali language and the translated version was pretested in Endocrinology Out Patient Department of Bir Hospital. Data were collected from March to May 2014. Study was conducted after receiving the ethical clearance from Institutional Review Board, Institute of Medicine and formal permission to collect data from the administration of TUTH. Further, informed verbal consent was obtained from each respondent before taking interview. Collected data were reviewed, coded and entered into SPSS version 16.0 for analysis. Descriptive analysis was done for prevalence of non-adherence and socio-demographic characteristics of diabetes patients. Odds Ratio was also calculated to measure the association between non-adherence and related factors.

Results

Socio-demographic Characteristics

The higher proportion of the respondents (29.8%) were in the 50-59 years age group and the mean age was 53.8years (SD=11.0). Half (50.1%) of the respondents were female, majority (63.5%) of the respondents belonged to Brahman/Kshetri ethnic group, 29.8% had primary level education, 40.4 % were house wives and 89.4% of the respondents were found to be married (Table 1).

Table 1: Socio-demographic Characteristics of the Respondents n=104

Variables	Frequency	Percent
Age in Years		
30-39	10	9.6
40-49	31	27.9
50-59	29	29.8
60-69	26	25.0
70-79	6	5.8
80-89	2	1.9
Mean Age- 53.8 years (SD ± 11.0)		
Sex		
Female	53	51.0
Male	51	49.0
Ethnicity		
Brhaman/Kshetri	66	63.5
Janajati	30	28.8
Dalit	4	3.8
Madhesi	3	2.9
Education Level		
Illiterate	23	22.1
Primary level	31	29.8
Secondary level	19	18.3
Higher secondary level	16	15.4
Graduate level and above	15	14.4
Employment status		
House wife	42	40.4
Services	20	19.2
Business	20	19.2
Unemployed	12	11.5
Pensioner	10	9.6
Marital Status		
Married	93	89.4
Unmarried	3	2.9
Widowed	6	5.8
Divorce/ separated	2	1.9

History of Diabetes among the Respondents

It was found that 44.2% of respondents had duration of diagnosis 1-5 years. Similarly, 43.3% of respondents had family history of Diabetes and 20.2% of participants were unknown about their family history (Table 2).

Table 2 : Duration of Diagnosis and Family History of the Diabetes of the Respondents n=104

History of Diabetes	Frequency	Percent
Duration of Diagnosis in Years		
1- 5	46	44.2
6- 10	36	34.6
11-15	15	14.4
15-20	7	6.7
Family History		
Present	45	43.3
Absent	38	36.5
Don't know	21	20.2

Prevalence and Reasons for Non adherence to Recommended Life style Modification

In the study, it was found that prevalence of non-adherence to exercise among the respondents was 67.3% and non adherence to diet was 52.9%. Regarding the reasons behind non adherence to recommended life-style, 45.83% answered weather (winter/raining) as the reason behind non adherence to regular exercise whereas 33.33% replied their busy schedule as the main reason. Similarly, reasons for non-adherence to diet were found to be situations at home (50.0%), eating outside of their home (31.8%), poor self control (22.7%) and financial constraints (13.6%) (Table3).

Table 3: Prevalence and reasons of Non adherence to Recommended Life Style Modification

Variables	Frequency	Percent
Prevalence of Non adherence to Life Style (n=104)		
Diet	55	52.9
Exercise	70	67.3
Reasons for Non-adherence *	**Frequency**	**Percent**
Non adherence to Diet (n=55)		
Lack of Knowledge	2	4.5
Outside eating habit (restaurant, ceremonies, work, family & friends' homes)	17	31.8
Inappropriate dietary habits (e.g. eating snacks in- between meals/ long gap in between 2 large meal)	10	18.2
Financial constraints (to buy healthy diets)	7	13.6
Poor self control	12	22.7
Situations at home (lack of family support)	27	50.0
Reasons for Non-adherence to Exercise* (n=70)		
Too busy schedule	23	33.3
Weather (winter/ raining)	32	45.8
Lacking exercise partner/ friends	4	6.3
Lack of specific area for exercise (fear of dog)	1	2.1
Criticism (presence of others make uncomfortable)	10	14.6
Perception that exercise exacerbating the illness (joint, back pain, respiratory problems)	43	41.3

- **Multiple responses**

Relationship between Non-adherence to Diet and Different Factors

Study had shown significant association between support from family and non adherence to diet. Those who received support from family were 0.312 times less likely to have non adherence to diet (OR=0.312, CI: 0.112-0.872). Also, those who had perception that proper diet plays role in management of diabetes mellitus were 0.473 less likely to have non adherence to diet. (OR=0.473, CI: 0.382-0.586). It was statistically significant. (Table4).

Table 4: Relationship between Non-adherence to Diet and Different Factors

Variables	Non adherence to Diet		Odds Ratio (OR)	95% CI	p-Value
	Yes	No			
Age					
Less than or equal to 40	4	6	0.562	0.149-2.122	0.212
More than 40	51	43			
Sex					
Female	28	25	0.996	0.461-2.151	0.991
Male	27	24			
Ethinicity					
Bramhin/Chhetri	32	34	0.614	0.273-1.380	0.235
Others	23	15			
Education level					
Illiterate	15	8	1.922	0.734-5.031	0.176
Literate	40	41			
Marital Status					
Married (at present)	48	45	0.610	0.167-2.223	0.447
Single	7	4			
Family History					
Yes	21	24	0.643	0.295-1.405	0.267
No	34	25			
Support from family					
Yes	38	43	0.312	0.112-0.872	0.020
No	17	6			
Regular Health Checkup					
Yes	32	37	0.451	0.194-1.049	0.060
No	23	12			
Received Written Instruction					
Yes	34	38	0.469	0.198-1.112	.081
No	21	11			
Perception that Proper Diet Plays Role in Management of Diabetes Mellitus					
Yes	44	49	0.473	0.382-0.586	0.000
No	11	0			

Relationship between Non-adherence to Exercise and Different Factors

The association between family support and non-adherence to exercise was significant at P<0.05 (OR =0.146, CI=0.032-0.665, p=0.002). Those who received support from family were 0.146 times less likely to have non-adherence to exercise. Likewise, those who had regular health checkups were 0.230 times less likely to have non adherence to exercise than those who did not have regular health checkups (OR=0.230, CI: 0.080-0.664).

Similarly, the association between perception of exercise as potentially exacerbating illness and non adherence to exercise was found significantly associated at P<0.05. Those who had perception of exercise as potentially exacerbating illness were 3.250 times more likely to have non-adherence to exercise. (OR=3.250, CI: 1.294-8.160).

Receiving written instruction was found significantly associated with non-adherence to exercise. Those who received written instruction were 0.173 times less likely to have non-adherence to exercise than those who did not receive written instruction. (OR=0.173, CI: 0.042-0.718). Also, those who had perception that regular exercise plays role in management of diabetes mellitus were 0.226 less likely to have non-adherence to exercise. (OR=0.226, CI: 0.062-0.821). (Table 5).

Table 5: Relationship between Non-adherence to Exercise and Different Factors

Variables	Non adherence to Exercise		Odds Ratio (OR)	95% CI	p-Value
	Yes	No			
Sex					
Female	38	15	1.504	0.660-3.430	.330
Male	32	19			
Age					
Less than or equal to 40	6	4	0.703	0.185-2.678	.256
More than 40	64	30			
Ethinicity					
Bramhin/Chhetri	43	23	0.762	0.321-1.809	.535
Others	27	11			
Education Level					
Illiterate	17	6	1.497	0.531-4.223	.438
Literate	53	28			
Marital Status					
Married (at present)	61	32	0.424	0.086-2.079	.256
Single	9	2			
Duration of Diagnosis					
1 to 5 year	31	15	1.007	0.447-2.298	.987
More than 5 year	39	19			
Family History					
Yes	29	16	0.796	0.349-1.815	.587
No	41	18			
Support from family					
Yes	49	32	0.146	0.032-0.665	.002
No	21	2			
Regular Health Checkup					
Yes	40	29	0.230	0.080-0.664	.003
No	30	5			
Perception of Exercise as potentially exacerbating their illness					
Yes	35	8	3.250	1.294-8.160	.009
No	35	26			
Received Written Instruction					
Yes	3	7	0.173	0.042-0.718	.011
No	67	27			
Perception that Regular exercise plays Role in management of diabetes					
Yes	49	31	0.226	0.062-0.821	0.011
No	21	3			

Discussion

In this study, it was found that non-adherence to exercise was 67.3% and non-adherence to proper diet was 52.9%. Rates of non-adherent patients to therapeutic lifestyle modification recommendations have been reported to range from 40 to 50% and some experts estimate that non-adherence to lifestyle measures is even higher.[6] Similarly, a study reported similar findings that the rates of non-adherence to diet and exercise were 37% and 52% respectively [7]. In another study, rates of non-adherence to dietary and exercise recommendations were estimated as 63.5% and 64.4% respectively[8]. Study by Nelson et al reported rates of non-adherence to diet and physical activity as 62% and 69% respectively[9]. Thomas et al. also reported rate of non-adherence to exercise as 66% of the individuals' sampled.[10] Likewise, another one study reported rates of non-adherence to diet and exercise were 28.1% and 49.1 % respectively.[11]

In this study, the main reason for non-adherence to diet was found to be home situation / lack of family support (50.0%).In contrast to this finding, the least mentioned reason for adherence to proper diet was their home situation (6.7%) in study of Botswana.[7] However, adherence to diet does require strong support from the patient's family, as meals are usually shared by all members in a family.[7] Likewise, finding of another one study showed that difficulty in following a diet regimen was different from that of the rest of the family (30.2%)[8]. However, other some studies reported that good support from spouse, family members and friends were good predictors to adherence to diet and exercise recommendations[9-10]. Lack of social support has been reported to affect patients' abilities to adhere properly to diet and exercise.[12] Lack of social support has been reported to affect patients' abilities to adhere properly to diet and exercise[13]. Similarly, in present study outside eating habit (restaurant, ceremonies, work, family and family and friends' home) (31.8%) was also found to be perceived reason for non-adherence to proper diet which is consistent with finding of the study done in Botswana showed that eating out (31.7%) as barrier for adherence to proper diet[7]. But in contrast, high frequency of social gatherings (13.7%) as barrier to adherence to diet in Kuwait.[8] Poor self control (22.7%) and inappropriate dietary habit (18.2%) were also found to be reasons for non-adherence to diet in this study. In contrast to current study, the main reason given for non-adherence to diet recommendations was poor self-discipline (63.4%) in Botswana[7]. Another study also reported that reasons for non-adherence to dietary recommendations were poor self-control (40%).[11] In current study, financial constraints (13.6%) and lack of knowledge (4.5%) were least common reasons of non-adherence to proper diet. In difference with these findings, financial constraints (28.8%) and lack of information (33.3%) appeared to be the most frequently reported reason for non-adherence to diet.[7] Similarly, Pascal et al reported financial constraints as the most common reason for non-adherence to diet[14]. This differences might be due do difference in study setting and populations.

In this study, the most common reasons for non-adherence to exercise were found to be weather (winter/raining season) (45.5%). In contrast to this finding, lack of information (65.7%) as most common and weather (15.5%) as less frequent reported barrier for adherence to exercise[7]. Similarly, other studies also reported intensely hot summer whether (27.8%)[8] and unfavorable weather conditions (21%)[11] as barriers for non-adherence to regular exercise. This difference might be due to differences in study setting and population. Another important reason for non-adherence to regular exercise was respondents' perception that exercise exacerbating the illness (joint and back pain, respiratory problems) (41.3%) in current study. Similarly, more than half (57.6%) of non-adherent patients thought that exercise would exacerbate their illness, one of the reasons being that they experienced body pains during and after exercising in Botswana[7]. A study of Kuwait also reported coexisting disease-mainly osteoarthritis and asthma (35.6%) as barrier to non-adherence to regular exercise.[8] In recent study, reasons for non-adherence to regular exercise were busy schedule (33.3%), criticism by other (14.58%), lacking exercise partner/friends (6.3%) and lack of specific area for exercise (fear of dog) (2.1%). In agreement with these findings, a study reported that barriers to adherence to regular exercise include lack of time (always being busy) (39.0%) and lack of exercise partner (3.7%) in Kuwait [8]. In the same way, too busy to exercise (31.5%), lack of exercise partner (28%), specific locations away from home (13.7%) and criticism (presence of others make uncomfortable) (0.9%) were reported as barrier to non-adherence to exercise[11].Another one study reported that barriers to do exercise were always being busy (44%) and coexisting diseases (9%).[15]

In this study, non adherence to diet and exercise had shown significant association with family support

which is consistent with the study conducted in Botswana. That study also reported that lack of emotional support from the spouse and friends was claimed to have contributed to non-adherence to diet and exercise recommendations[7]. Other studies also found that good support from spouse, family members and friends were good predictors to adherence to diet and exercise recommendations.[10,12,16] Non adherence to diet and exercise was also found significantly associated with perception of respondents that proper diet and regular exercise play important role in management of diabetes mellitus. This finding was consistent with study done in Botswana which reported that most of the respondents understanding of diet and exercise had a direct influence on their adherence to diet and exercise recommendations[7.] This study also showed that non-adherence to exercise was significantly associated with regular health checkup, and received written instruction.

Conclusion

There was a high rate of non-adherence to diet and exercise recommendations by patients suffering from type 2 diabetes mellitus seen in Diabetes Clinic, Tribhuwan University Teaching Hospital. Prevalence of non-adherence to exercise recommendations was higher than non-adherence to diet. The most common reasons for non-adherence to diet were lack of family support, poor self control and outside eating habit. The most frequent reasons for non-adherence to exercise were perception of exercise as potentially exacerbating illness, adverse weather (winter/raining) and respondents' busy schedule.

Conflict of Interest: None declared

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