Factors influencing quality of life among elderly population with type 2 diabetes mellitus: a clinic based cross sectional study in Kathmandu Valley

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Abstract

Purpose - Diabetes is one of the four priority non-communicable diseases whose worldwide prevalence is at an increasing trend and is accompanied by deterioration of quality of life especially that of the elderly population. Several factors contribute to influence quality of life among the elderly. This study aims to identify the factors that influence quality of life among elderly population of Kathmandu valley, Nepal.

Design/methodology/approach - A cross-sectional survey was conducted among random sample of 310 elderly diabetic patients visiting diabetic clinic of Kathmandu Diabetes and Thyroid center in Kathmandu valley, Nepal. Translated Nepali version of WHOQOL BREF was taken from previous studies' validated questionnaire and was administered through face to face interview in order to obtain the data. Association of independent and dependent variables were assessed in bivariate analysis using Independent sample t-test, ANOVA and Pearson correlation and multivariate analysis was done using multiple linear regression analysis with estimation of five models.

Findings - Descriptive analysis showed that more than half of the respondents had moderate quality of life and analytical statistics showed that factors such as age, sex, marital status, income, educational level, lifestyle, diabetes self-management, fasting blood sugar level, complications, convenient hours of operation to be significantly associated with total score of quality of life.

Originality/value - Several factors contributed to influence quality of life and in addition to health attention should be paid to other aspects of their life also. Among several factors diabetes self-management is one critical factor among diabetic population which is essential to enhance wellbeing, better glycemic control, fewer complication and hence improve quality of life. Therefore, self-management training with an effort to enhance coping skills should be incorporated and effective strategies should be formulated in order to deal with several aspects of life of elderly population that could influence their quality of life.

Keywords Quality of life, Type 2 Diabetes mellitus, Ageing, Nepal

Paper type Research paper

Introduction

Worldwide prevalence of non-communicable diseases is increasing at an alarming rate. With 38 million global deaths in 2012, the four priority non-communicable diseases (NCDs), such as diabetes, chronic respiratory diseases, cancers and cardiovascular diseases have the greatest share of mortality in the world [1].

In comparison with 108 million individuals with diabetes in 1980, it was evaluated that around 422 million adults were living with diabetes in 2014 causing 4.9 million deaths globally [2].

Like other developing countries, Nepal is also going through its epidemiological transition, from high prevalence of communicable to that of non-communicable disease and is currently facing double burden of diseases [3]. A number of cross-sectional studies have reported the prevalence of Type 2 DM in different settings in Nepal. For instance, a study to demonstrate the prevalence of diabetes mellitus among elderly population aged 60 years and above in Kathmandu, it was seen that the general predominance of Type 2 DM was 25.9% and almost half of the cases were diagnosed amid the study [4].

With the burden of NCD's increasing every year, there has been minimal effort with regard for prevention and control of diabetes mellitus. In a country like Nepal where only 6% of its GDP is spent on -health care with limitation of resources and most of the expenditure (about 70%) being out-of-pocket, non-communicable disease like diabetes mellitus bring about additional challenges to the individual, society and nations' healthcare system as a whole. While several studies have tended to the issue of QOL among diabetes patients [5] over various cultural settings globally, a little is known about the concept of QOL in Nepal. However, very few researches on quality of life focusing on elderly and a single research in health related quality of life among patients with type 2 diabetes mellitus is available. Therefore, this study into quality of life is an endeavor to identify and address the factors that influence quality of life in elderly population in hopes of maintaining their versatility, dynamic commitment to society and independence, helping them deal with the challenges of old age and bring about constructive and positive experience of ageing.

Methods

A cross-sectional study was conducted to identify the factors influencing quality of life among elderly diabetics in Kathmandu valley, Nepal. Study site was selected on purpose and simple random sampling method was adopted for selection of 310 participants from the appointment list of the hospital. All participants who were diagnosed as type 2 diabetes meeting the inclusion criteria of being 60 years and above, residing in Kathmandu valley and those diagnosed for more than a year were interviewed. Data collection was done in a separate quiet room in the clinic by face to face interview through interviewer administered questionnaire. The questionnaire consisted of five parts consisting of socio-demographic characteristics (part 1), diabetes self-management questionnaire (part 2), medical history (part 3), accessibility to health services (part 4) and quality of life (part 5). For quality of life questionnaire, translated Nepali version of WHOQOL BREF was taken from previous studies' validated questionnaire, similarly questions on diabetes self-management was taken from standard diabetes self-management questionnaire with confirmed validity. Whereas for other parts of the questionnaire; content validity method was adopted where panel of three experts were consulted for its accuracy and appropriateness by using Item Objective Congruence (IOC) Index. Reliability was however ensured by pre testing the questionnaire with 30-35 participants from another hospital. Internal consistency measured by Cronbach demonstrated good internal consistency with Cronbach's alpha 0.762. Biomarker such as fasting blood sugar was recorded from patient's OPD card but HbA1c however could not be recorded due to unavailability of the record during the time of the interview. The collected data were edited coded and analysis was done using SPSS version 21. Frequency and percentage was presented to describe the basic features of all independent variables (socio demographic characteristics, diabetes self-management behavior, lifestyle, medical history and accessibility to health services) and dependent variable (quality of life). Bivariate analysis such as independent sample t-test ANOVA and correlation was done to find the relationship of all independent variables with dependent variable. In order to find association between several independent variables and a dependent variable at the same time multivariate regression was used. Inclusion of variables was based on conceptual and empirical evidence from previous literature. Five multiple regression models were estimated in order to assess the individual as well as combined effects of set of variables on the outcome measurement of a continuous variable. The predictors in the final regression equation and the quality of the model were described using the

accuracy of the prediction by adjusted R^2 and *p*-value of less than 0.05 was considered as threshold for statistical significance.

This study was reviewed and approved by the Nepal health research council (NHRC), Ministry of Health and Population (MoHP). Informed consent was signed by all the participants.

Results

Descriptive analysis of the study population

Table 1 showed that, population had the median age of 62 with majority of participant in the age group of 60-69 years. Male and female comprised of 45.5% and 54.5% of the study population. 71.3% were married and 28.7% were unmarried. More than half of the respondents had middle income (57%), and 20% had no schooling. Moderate level of self-management was observed among majority of the participants. Nearly 3/4th of the population had moderate level of self-management, Majority of the respondents were never smokers (58.7%) and never drinkers (48.4%). Nearly 1/3rd of the population had been diagnosed with diabetes for more than 10 years and 45% had fasting blood sugar less than 126md/dl. Around 93% did not have any complications and more than half of the population (56.1%) suffered from co morbidities. Majority of the population had moderate quality of life in all domains, 67.7% in physical health, 80% in psychological health, 49% in social relationships, 87.7% in environmental and 66.1% in overall QOL and general health. Analysis of accessibility to health care showed that majority of the respondents went mostly to hospital to get care (71.3%) and around half of them lived at a distance of 2-5 km from the health care facility and more than half of the population used public vehicle. Around 92% of the respondents found the hours of operation of the health care facility to be convenient.

Factors associated with quality of life

Bivariate analysis showed statistically significant relationship of age, sex, marital status, income, educational level, diabetes self-management, drinking and smoking status, fasting blood sugar, complications and hours of operation of health care facility with quality of life. Whereas duration of DM, treatment regimen, co morbidities, location of getting care, distance to health care facility, waiting time, cost, behavior and privacy were not statistically significant.

Table 2 shows the result of multivariate analysis models without controls (model 1) and with controls (model 2, model 3, model 4 and model 5). Age, marital status and convenient hours of operation remained significant and when adjusted with all set of variables (model 5). In model 5 after adjusting with all set of variables, age more than 80 years and marital status showed (B=-26.628 and B=-41.891 respectively) showed lowest quality of life score than age group of 60-69 years compared to models with control (model 2, model 3, model 4). Variables such as high income (B=24.158) and female sex (B=-12.976) were associated with quality of life without controls in model 1 indicating high income to have higher quality of life score than low income and female sex to have lower quality of life score than male sex . However, after adjusting with confounding variables in subsequent models, it lost its association with quality of life.

Educational level without controls in model 1 (Table 2) showed statistically significant association with all the categories indicating lower quality of life score for people who had no schooling compared to other groups. After adjusting with income (model 2), educational level bachelors and above had significant reduction of quality of life score (B=23.923).

Table 1. Descriptive analysis of socio demographic, lifestyle factors and medical history of study population (n=310)

Variables	Frequency	Percentage
Age group (years)		
60-69	209	67.4
70-79	71	22.9
>80	30	9.7
Mean±SD	65.33±6.90	
Gender		
Male	141	45.5
Female	169	54.5
Marital status		
Married (living with a partner)	221	71.3
Unmarried/divorced/widow (not living with a partner)	89	28.7
Income		
Low income	86	27.7
Middle income	177	57.1
High income	47	15.2
Educational level		
No schooling	62	20.0
Grade 1-10(primary)	110	35.5
Grade 10-12(Secondary)	61	19.7
Bachelors degree and above	77	24.8
Smoking status		
Current smoker	46	14.8
Past smoker	82	26.5
Never smoker	182	58.7
Drinking Status		
Current drinker	55	17.7
Past drinker	105	33.9
Never drinker	150	48.4
Complications		
Nephropathy	5	1.6
Retinopathy	15	4.8
Neuropathy	2	0.6
Comorbidities		
Hypertension	171	55.2
Stroke	1	0.3

Table 2. Socio demographic variables controlled with set of socioeconomic (model 3) and diabetes self-management variables (model 4) and all sets of variables (model 5)

Variables	Model 1	Model 2	Model 3	Model 4	Model5
Sociodemographic					
Age (years)					
60-69					
70-79	-26.509***	-10.172*	-9.613*	-9.375*	-10.017*
>80	-49.729***	-23.326***	-23.683***	-22.683***	-26.628***
Model summary	*R=0.458, R²=0.209*				
Sex					
Male(ref)					
Female	-12.976**	-5.978	-23.388	-5.463	-1.191
Model summary	*R=0.146, R²=0.031*				
Marital status					
Living with a partner (ref)					
Not living with a partner	-52.544***	-43.877***	-43.753***	-43.311***	-41.891***
Model summary	*R=0.648, R²=0.420*	*R=0.676, R²=0.457*			

Table 2. (continued)

Variables	Model 1	Model 2	Model 3	Model 4	Model5
Socioeconomic					
Income					
Low (ref)					
Middle	10.612	-0.774	-5.613	-5.420	-4.191
High	24.158***	11.248	2.7	1.805	-2.18
Model summary	*R=0.20,*				
	R²=0.043				
Educational level					
No schooling (ref)					
Primary	19.774***	19.575***	2.41	1.293	2.67
Secondary	25.889***	25.631***	2.504	0.955	2.031
Bachelors and above	27.813***	23.923***	2.062	0.112	2.878
Model summary	*R=0.274,*	*R=0.294,*	*R=0.680*		
	R²=0.075	*R²=0.086*	*R2=0.447*		
Diabetes self- management					
Diabetes self-management	2.334***	2.383***		0.513	0.953
Model summary	*R=0.262,*	*R=0.315,*		*R=0.686,*	
	R²=0.069	*R²=0.099*		*R2=0.453*	

Tables 3. Multiple linear analysis of medical history, diabetes self-management and socio demographic variables with total score of quality of life

Variables	Model 1	Model 2	Model 3	Model 4	Model5
Medical history					
Duration of DM					
1-5 years (ref)					
6-10 years	-3.827	-1.288	-1.253	-1.573	-1.164
More than 10 years	-5.335	1.137	1.126	5.860	5.994
Model summary	*R=0.062,*				
	R²=0.004				
Treatment regimen					
Oral hypoglycemic agent (ref)					
Insulin	-9.472	-3.206	-3.268	4.892	4.076
Both	8.208	6.60	6.15	0.712	6.445
Dietary modifications only	-10.157	-7.778	-7.712	-8.662	-4.474
Model summary	*R=0.123,*				
	R²=0.015				
Fasting blood sugar (FBS)					
<126mg/dl (ref)					
126-200mg/dl	-11.183*	-10.248*	-7.432	-2.470	-1.6
>200 mg/dl	-14.803**	-11.258*	-12.787*	-6.062	-4.693
Model summary	*R=0.174,*				
	R²=0.030				
Complications					
Yes (ref)					
No	23.351**	18.533*	8.469	2.202	2.595
Model summary	*R=0.160,*				
	R²=0.026				
Co-morbidities					
Yes (ref)					
No*	7.124	3.277	3.942	3.065	3.459
Model summary	*R=0.096,*	*R=0.240,*			
	R²=0.009	*R²=0.057*			
Diabetes self-management					
Diabetes self- management	2.334***	2.383***	2.526***	0.308	0.953
Model summary	*R=0.262,*	*R=0.315,*	*R=0.240*		
	R²=0.069	*R²=0.099*	*R²=0.026*		
Socio-demographic					
Age (years)					
60-69					
70-79	-26.509***	-10.172*		-10.496*	-10.017*
>80 years	-49.729***	-23.326**		-25.309***	-26.628***
Model summary	*R=0.458,*				
	R²=0.209				

Tables 3. (continued)

Variables	Model 1	Model 2	Model 3	Model 4	Model5
Sex					
Male(ref)					
Female *	-12.976**	-5.978		-5.987	-1.191
Model summary	*R=0.146,*				
	R²=0.031				
Marital status					
Living with a partner (ref)					
Not living with a partner	-52.544***	-43.877***		-42.084***	-41.891***
Model summary	*R=0.648,*	*R=0.676,*		*R=0.695*	
	R²=0.420	*R²=0.457*		*R²=0.459*	

Table 3 shows that, after adjusting with other medical history variables (model 2) having fasting blood sugar of 126-200mg/dl (B=-10.248) and more than 200mg/dl (B=-11.258) were associated with lower quality of life than fasting blood sugar of less than 126mg/dl and having no complications (b=18.533) were associated with higher quality of life than those having complications.

Discussion

The main aim of this study was to identify the factors influencing quality of life among elderly with type 2 diabetes mellitus. Responses of 310 type 2 diabetic populations aged 60 years and above were collected. The median age was 62 years with maximum number of respondents in the age group of 60-69 years Moderate quality of life was observed in majority of the respondents in all the domains which is similar to a study conducted in India revealing moderate quality of life.

In this study, both the age group 70-79 years and >80 years revealed lower quality of life compared to younger age group 60-69 years in all five models with and without controlling for other variables. This finding is in accordance with other studies conducted in Nepal and in Asia which suggest lower quality of life among older age group compared to younger age group. It appears that advancing age does affect some aspects of health-related quality of life in people with diabetes, which may be due to increasing amount of co-morbidity, psychosocial morbidity and physical disability, including poor social freedom, impaired cognitive function and increased medical service use in old age.

Similarly, not living with a partner was associated with lower quality of life score than living with a partner in all the models. This finding is congruent with that of Tajvar and Hanestad who reported that unmarried, widowed, separated/divorced people or those living alone had lower quality of life than the individuals who were married and were living with a partner [6].

Studies have reported that socioeconomic status (measured by income and educational level) of people having higher education and higher income to be associated with higher quality of life [7]. Whereas current study revealed highest quality of life among secondary level education on controlling educational level with income (model 2) in multivariate analysis (lowering the quality of life score of bachelors and above). This finding is unexpected of and counter intuitive in light of findings of current literature. A possible reason for this unanticipated finding may be due to interaction of higher education with income in such a way that despite of having higher education, they might not be satisfied with their income which in turn might have lowered their quality of life score.

Diabetes self-management showed positive statistically significant association with quality of life with and without controlling for confounders in (model 1 and model 2, model 3 respectively). A reasonable explanation for this expected

association of higher self-management with higher quality of life is due to the fact that effective management with better glycemic control and hence less disease burden leading to better quality of life outcome [8].

Never drinkers remained significantly associated with quality of life after adjusting with diabetes self-management with further reduction of quality of life score indicating lower quality of life compared to current drinkers. This result of current drinkers having better quality of life is justified by the evidence that moderate consumption of alcohol has been reported to decrease the risk of diabetes by approximately 30% and it is only instances of prolonged heavy alcohol intake where alcohol was shown to have delirious effect [9]. Two possible assumptions can be made from current and past studies that current drinkers have better quality of life probably either due to better glycemic control and fewer number of complications or due to the associations that have been identified relate to effects of social interaction which might have resulted in higher quality of life among them. However, the current study does not enable us to examine the association of type of drinking and social interaction on quality of life that would strongly reinforce this finding in greater detail and that future researches are needed addressing the fore mentioned factors.

After adjusting fasting blood sugar more than 200mg/dl and having no complications with medical history (duration, treatment regimen, fasting blood sugar, complications and co morbidities) and diabetes self-management score, the quality of life score reduced. Similar findings have been observed in other studies, which report that lower fasting blood glucose levels have shown association with less fatigue and fewer self-reported symptoms of hyperglycemia which reduced diabetes burden and increased treatment satisfaction, resulting in better quality of life compared those having higher blood sugar levels [10]. Similar results have been observed in other studies in line with the results of this study regarding complications which report that the incidence and severity of diabetes complications have significant impact on quality of life [7].

Multivariate analysis demonstrated convenient hours of operation to be positively associated with quality of life in all the models (before and after controlling for confounders) indicating higher quality of life scores for those who perceive the operating hours of the health care facility to be convenient for them. This is consistent with a national health care quality report of US which address the importance of timeliness and its impact on health status and quality of life [11].

Health center as location of getting care was statistically significant when adjusted with all set of variables (model 5) with increase in quality of life score. This might have resulted due to the fact that elderly people with chronic disease face problems with access and ability to go to appointments with lack of financial support [12] and therefore less cost and ease of approach to the nearest health care facility might have resulted in higher quality of life scores than going to hospital or private clinic.

The current study has several limitations; HbA1c which is a better indicator of glycemic level could not be recorded due to unavailability of the record at the time of the interview. There were many missing values on question 21 (regarding sex life of the individual) it being a sensitive question, widow/widower, divorcee and unmarried participants preferred not to answer and therefore could not be recorded. As the study area was chosen by purpose, and the sampling took in account only OPD patients, the findings of the study cannot be generalized for the whole diabetic population of Kathmandu valley and such design might have biased our results in a way that we recruited a sample of better off elderly people. The cross-sectional nature of this study made it difficult to identify cause effect relationship and

variations at different point of time. Though diabetes self-management questionnaires have been validated in other countries, this is the first study to use this questionnaire in Nepal and that few questions might not have been suitable in Nepalese context.

Conclusion

Several factors contribute to affect quality of life of elderly with diabetes and more attention should be paid to all aspects of their life in addition to health such as their economic status, lifestyle and accessibility to health care services. Among several factors diabetes self-management is one critical factor among diabetic population which is essential to enhance wellbeing, achieve good glycemic control with fewer complications and distress and hence improve quality of life. It is hoped that this survey could add to the existing literature on QOL of old people in Nepal and findings from this study will assist clinicians, policies makers, concerned bodies of disease prevention and control, and others in developing targeted interventions for elderly patients in order to add quality to their life and bring about positive and constructive experience of ageing.

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