

# Prevalence, Pattern, and Attitudes of Smoking among Libyan Diabetic Males: A Clinic-Based Study

Hawa Juma El-Shareif<sup>1</sup>

<sup>1</sup>Department of Endocrine, Tripoli Medical Centre, Faculty of Medicine, Tripoli University for Medical Sciences, Tripoli, Libya

## Abstract

**Introduction:** Smoking is a major avoidable cardiovascular risk factor and is a cause of premature death worldwide. **Objectives:** To study the prevalence, pattern, and awareness of health hazards of smoking among Libyan diabetic male patients in Tripoli Medical Center, Tripoli, Libya. **Patients and Methods:** A cross-sectional, clinic-based study using a predesigned questionnaire, the participants were interviewed by the author. The interview covered personal data, and questions about their smoking status, and their awareness of smoking hazards. **Results:** The overall prevalence of current smoking was 26.4% and past smoking 40.3%. The mean age was  $50.8 \pm 14.4$  years (range 18–75 years). The mean age at which smoking started was  $18.6 \pm 5.3$  years; all current smokers were cigarette smokers. Main reason for quitting smoking was related to health issues while social and religious considerations were the main reasons for never smoking. **Conclusions:** The prevalence of smoking among Libyan diabetic patients was high; this calls for incorporating smoking cessation services within the diabetes care clinics.

**Keywords:** Cessation, diabetes, initiation, Libya, smoking

## INTRODUCTION

Diabetes imposes high economic and social costs on countries at all income levels. The estimated number in 2013 of diabetic patients was 382 million and is expected to increase by 55% by 2035.<sup>[1]</sup> The burden of diabetes is mounted, by its complications. It is the leading cause of lower-limb amputation, renal failure, and blindness. The control of associated cardiovascular risk factors and modification of lifestyle habits constitute an integral part of diabetes management, to prevent complications.<sup>[2]</sup> Smoking is a major modifiable risk factor for premature mortality. It shortens the lifespan, on average, by 10 years, and cessation before the age of 40 years decreases that loss by about 90%.<sup>[3]</sup> The rate of death from any cause among current smokers is about three times as high as among persons who never smoked.<sup>[4]</sup>

Even in patients without diabetes, urinary albumin, a marker of potential renal damage, and cardiovascular mortality increases in a dose-dependent manner with the number of cigarettes smoked per day.<sup>[5]</sup> In diabetic patients, smoking increases the risk of stroke by 30%, myocardial infarction 1.4 fold and progression to end-stage renal disease (ESRD).<sup>[6,7]</sup> Data from Libya indicate a high

prevalence of cigarette smoking among high-risk diabetic patients. A study evaluating the prevalence of risk factors in acute myocardial infarction patients admitted to the coronary care unit of Tripoli Medical Center (TMC), Libya has shown a high prevalence of current smokers 62.6%, and diabetes mellitus (DM) (42.9%), among admitted Libyan male patients.<sup>[8]</sup> In a systematic review of ten epidemiological studies, diabetic kidney disease was the leading cause of dialysis-treated (ESRD) among Libyans, the prevalence and incidence of diabetic kidney disease were 26.5% and 28.4%, respectively.<sup>[9]</sup> In a retrospective study of 5 years mortality among ESRD patients undergoing maintenance hemodialysis, diabetic nephropathy was the underlying cause in 27.4% of patients, with a mortality rate of 74.1%. The prevalence of cigarette smoking among diabetic patients was 23.3% and was associated with increased mortality risk.<sup>[10]</sup>

**Address for correspondence:** Dr. Hawa Juma El-Shareif, Department of Endocrine, Tripoli Medical Center, Faculty of Medicine, Tripoli University for Medical Sciences, Tripoli, Libya.  
E-mail: hawa\_elsharif@yahoo.com

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Smoking cessation has been shown to reduce the risk of cardiovascular disease (CVD) and death in people with diabetes and international guidelines and evidence and has strongly recommended smoking cessation in diabetic patients for better outcomes.<sup>[2,11,12]</sup> Therefore, this study was conducted to determine the prevalence and pattern of cigarette smoking among Libyan diabetic male patients attending the outpatient clinic of TMC and to assess their altitude and knowledge about smoking.

## PATIENTS AND METHODS

All male diabetic patients who visited the clinic during the study period were included in the study after verbal consent. A questionnaire was administered through face-to-face interview and responses were recorded. Information was obtained on the following topics: demographic information including the patient's age, education level, occupation, medical history, duration of diabetes, and diabetes medication. Smoking behavior characteristics such as age of smoking initiation, duration of cigarette smoking, the average number of cigarettes smoked in a day, type of tobacco smoking, and smoking cessation attempts were captured.

Patient's perception of the effects of smoking on health and diabetes complications were assessed. Also inquiries were made about the source of information about the hazards of cigarette smoking. The never smokers were asked about the reasons for not smoking, and the smokers about the reasons for the quitting attempts. Smoking was defined as current cigarette smoking or ex-smoking based on the patient response to a close-ended question; are you a smoker, regardless of daily consumption.

Statistical analysis was performed using the Statistical Package for the Social Science (SPSS Inc., IBM, Chicago, IL, USA), 19<sup>th</sup> version. Continuous variables are expressed as mean  $\pm$  standard deviation. Categorical data are expressed as numbers and percentages.

## RESULTS

### Patient characteristics

Two hundred and sixteen diabetic male patients were interviewed, 180 (83.3%) were type 2 diabetes and 36 (16.7%) were type 1 diabetes, 45 (20.8%) were hypertensive. The mean duration of diabetes was  $6.1 \pm 6.8$  years (0.1–38.0), 69 (31.9%) were on insulin, 132 (61.1%) on oral hypoglycemic agents and 15 (6.9%) on diet control. The mean age of the study patients was  $50.8 \pm 14.4$  years (range 18–75), 102 (47.2%) were  $\geq 55$  years of age and 12 (5.6%) were  $\leq 24$  years of age [Table 1]. Among the respondents, 36 (16.7%) were illiterate, 51 (23.6%) educated to 9<sup>th</sup> grade, and 42 (19.4%) completed university education [Table 1]. 6 (2.8%) were students, 6 (2.8%) were unemployed, 45 (20.8%) were retired, and the rest were working.

### Smoking behavior

The various aspects of smoking behavior are detailed in Table 2. Among the respondents, 57 (26.4%) were current

**Table 1: The demographic characteristics of the participants**

Variables	Result
Age, mean $\pm$ SD	50.8 $\pm$ 14.4
Type-2 diabetes, n (%)	180 (83.3)
Diabetes duration (years), mean $\pm$ SD	6.1 $\pm$ 6.8
Type of treatment, n (%)	
Diet control	15 (6.9)
OHA	132 (61.1)
Insulin	69 (31.9)
Hypertension, n (%)	45 (20.8)
Age group, n (%)	
<25	12 (5.6)
25-34	18 (8.3)
35-44	39 (18.1)
45-54	33 (15.3)
55-64	63 (29.2)
$\geq 65$	39 (18.1)
Missing	12 (5.6)
BMI, mean $\pm$ SD	
Never smoked**	29.9 $\pm$ 4.1
X-smokers**	29.2 $\pm$ 4.2
Smokers	26.2 $\pm$ 3.3
Systolic blood pressure, mean $\pm$ SD	
Never smoked <sup>†</sup> **	137.8 $\pm$ 24.6
X-smokers <sup>‡</sup>	131.6 $\pm$ 20.1
Smokers	123.8 $\pm$ 21.1
Level of education, n (%)	
Illiterate	36 (16.7)
Preparatory or less	51 (23.6)
Secondary or more	45 (20.8)
High school	39 (18.1)
University	42 (19.4)
Missing	3 (1.4)
Occupation, n (%)	
Unemployed or retired	51 (23.6)
Student	6 (2.8)
Soldier	6 (2.8)
Skilled and unskilled workers	84 (38.9)
Professionals, and officers	69 (31.9)

\*\* $P < 0.005$  when compared to current smoker, <sup>†</sup> $P < 0.05$  when compared to current smoker. SD: Standard deviation, OHA: Oral hypoglycemic agents, BMI: Body mass index

smokers, 87 (40.3%) were ex-smokers, and 72 (33.3%) were never smokers. The mean age at starting of smoking was  $18.6 \pm 5.3$  years (11–35) and the mean duration of smoking was  $19.6 \pm 14.0$  years (1–51).

The prevalence of smoking was 42.9% in those younger than 40 years, 30.8% in the age group 40–49 years, 21.1% in the age group 50–59 years, and 22.7% in those older than 59 years.

Among the smokers, 138 (95.8%) were smoking cigarette tobacco, 3 (2.1%) waterpipe, and 3 (2.1%) consuming smokeless tobacco; mean amount of cigarette packets per day was  $1.2 \pm 0.7$  (0.1–3.5).

**Table 2: Smoking behavior**

Variables	Result
Smoking status, <i>n</i> (%)	
Current smoker	57 (26.4)
Ex-smoker	87 (40.3)
Never-smoked	72 (33.3)
Age of smoking initiation, mean±SD	18.6±5.3
Type of tobacco products smoked, <i>n</i> (%)*	
Cigarettes	138 (95.8)
Shisha (Waterpipe tobacco)	3 (2.1)
Smokeless tobacco	3 (2.1)
Number of cigarette smoked/day, <i>n</i> (%)	
1-15	42 (19.4)
16-30	72 (33.3)
>30	30 (13.9)
Quit thinking, <i>n</i> (%)	
No	9 (6.2)
Yes before DM	6 (4.2)
Yes after DM	87 (60.4)
Yes before and after	42 (29.2)
Smoking cessation attempt, <i>n</i> (%)	
No	12 (8.3)
Yes before DM	9 (6.3)
Yes after DM	81 (56.3)
Yes before and after	42 (29.2)
Reason for smoking cessation attempt, <i>n</i> (%)*	
Health	69 (52.3)
DM, other health problem	18 (13.6)
Friend, family's advice	18 (13.6)
Doctor's advice	3 (2.3)
Save money	15 (11.4)
For no reason	12 (9.1)
No reply	15 (11.4)

\*Participants may tick more than one choice. SD: Standard deviation, DM: Diabetes mellitus

### Knowledge and attitude toward tobacco control

The knowledge and attitude toward tobacco control data are shown in Table 3. Two hundred and one (93.1%) strongly agreed that smoking is harmful and 186 (86.1%) knew one or more of diabetes complications. One hundred and fifty (69.4%) could recognize more than two diabetes-related complications. One hundred and twenty-six (58.3%) were aware of the smoking association with renal damage, 141 (65.3%) agreed it causes retinal damage, 156 (72.2%) were aware of its association with atherosclerosis, 162 (75.0%) knew it causes myocardial infarction, and 141 (65.3%) knew it causes a stroke. In response to the question about their source of information about smoking hazards, the majority agreed that doctors 129 (59.7%), media 156 (72.2%), friends 141 (65.3%), and family 132 (61.1%) were the source of their information.

### Smoking cessation

Among those with history of smoking, 135 (93.8%) pointed to that they have thought about quit smoking; 6 (4.2%) before diabetes and 87 (60.4%) after diabetes onset and 42 (29.2%) before and after diabetes onset [Table 3]. One hundred and

**Table 3: Participants awareness and attitude towards smoking**

Variables	Result
Smoking is harmful, <i>n</i> (%)	
Strongly agree	201 (93.1)
Lightly agree	9 (4.2)
Do not agree	3 (1.4)
I do not know	3 (1.4)
Smoking increases the risk of developing of the following diabetes complications, <i>n</i> (%)*	
Atherosclerosis	156 (72.2)
Myocardial infarction	162 (75.0)
Stroke	141 (65.3)
Renal	126 (58.3)
Retinopathy	141 (65.3)
Awareness of smoke and complication, <i>n</i> (%)*	
0	30 (13.9)
1	15 (6.9)
2	21 (9.7)
3	27 (12.5)
4	27 (12.5)
5	96 (44.4)
Source of information about smoking hazards, <i>n</i> (%)*	
Friends	141 (65.3)
Family	132 (61.1)
Doctors	129 (59.7)
Media	156 (72.2)
General fact, their observation	27 (12.5)
Reasons for not smoking, <i>n</i> (%)*	
Religious consideration	24 (33.3)
Social consideration	39 (54.2)
Health consideration	33 (45.8)
Financial factors	6 (8.3)
Cannot tolerate it	6 (8.3)
Not come in contact with	3 (4.2)

\*Participants may tick more than one choice

thirty-two (91.7%) have trails of quitting smoking, 9 (6.3%) before diabetes, 81 (56.3%) after diabetes and 42 (29.2%) before and after diabetes onset. The mean duration of quit was  $3.2 \pm 2.5$  years (1–12). In response to the question about their reasons to quit trial 69 (52.3%) said because of its harmful effect, 15 (11.4%) because of financial issues, 18 (13.6%) because of friends and family pressure and 18 (13.6%) after they got health problem. Other rare causes as hate it, not found his brand. The main reason to quit for ex-smokers was health concerns, i.e., 57 (65.4%). Reasons for not smoking among never smokers were social restrains – 39 (54.2%), health hazards – 33 (45.8%), followed by religion – 24 (33.3%).

### DISCUSSION

This study showed a high prevalence of smoking among Libyan diabetic males in TMC. About two-thirds of the interviewed diabetics were either current or past smokers. The prevalence of current smoking in this study was 26.4%, which is near to the prevalence reported from Benghazi Diabetes

Center (26.7%).<sup>[13]</sup> These figures are lower than the prevalence of current male smokers in the general population.

In the STEP survey-2009, 3625 individuals aged 25–64 years were evaluated for the prevalence of cardiovascular risk factors. The overall prevalence of smoking was 25.1%, with males being 49.6% and females 0.7%.<sup>[14]</sup> This may be due to underreporting, by diabetic patients, as respondents might understand that smoking is risky for their health and embarrassed to admit the behavior. Increased awareness of diabetic patients about the magnified health hazards associated with smoking in the presence of diabetes is another possible explanation. As reported in the STEP survey, the prevalence of smoking is higher in the younger age group. Decreasing smoking prevalence with increasing age could be due to earlier morbidity and mortality among diabetic smokers compared to nonsmoker counterparts.

Age is an important predictor and a strong motivation tool of smoking cessation due to the increasing development of aging-associated health problems and patients concern's over their health in the older age group smokers who stop smoking, still have the potential to obtain the health benefit of quitting,<sup>[15]</sup> thus continuous education and support for diabetic patients across all age groups is beneficial.

In STEP survey-2009, the average age at initiation of smoking was 19.3 years, which is similar to our study (18.6 years). Studies showed that peer pressure, curiosity and parental smoking played a role in smoking initiation, the self-affirmation of adolescents may also contribute to the increased smoking initiation risk at late adolescence.<sup>[16,17]</sup> Implementing health education programs of health hazards of smoking in schools, would increase the awareness of this vulnerable group and protect youth, from adopting this hazardous habit.

All current smokers were cigarette smokers, history of oral tobacco and shisha (waterpipe tobacco) smoking each was reported by 3.4% of ex-smokers. Waterpipe tobacco smoking is more prevalent in Lebanon, Syria, Egypt, and Jordan. The prevalence of waterpipe smoking in these countries ranges from about 20%–69%.<sup>[18]</sup>

Majority (93.1%) of the interviewed patients strongly agreed that smoking is harmful to their health, and all never smokers and 78.9% of the current smokers strongly agreed that smoking is harmful. Furthermore, more than two-thirds of the interviewed patients were aware of the link between smoking and three or more of the diabetes-related complications.

Smoking is a well-recognized risk factor for the development of lung disease, CVD, cancer, as well as stroke.<sup>[3]</sup> Smoking may also be associated with the development and progression of microvascular complications of diabetes.<sup>[19]</sup> Smoking cessation greatly decreases cardiovascular morbidity and mortality and the risk of developing other smoking-associated diseases such as pulmonary diseases and malignancy.<sup>[20]</sup>

Studies showed that awareness of smoking harm alone is not enough to encourage people to stop smoking.<sup>[21,22]</sup> Consistent with other studies, religion was a frequent reason for not smoking among never smokers (33.3%), but not the motive to quit smoking.<sup>[23]</sup> In the present study, health was the most frequent motivator to quit smoking, this is consistent with findings from other studies.

Similarly, among the health-related reasons, awareness of the smoking-related health hazard, and desire to maintain health was the most common reason to stop smoking (52.3%), followed by the presence of current medical illness (13.6%).<sup>[23]</sup> Barriers to sustained smoking cessation among diabetics include fear of weight gain, depression, and stress related to diabetes.

The present study showed that smokers have lower body mass index than never smokers and that their systolic diastolic blood pressure was significantly lower when compared with never smokers. Although the temporary weight gain observed after smoking cessation, increases the risk of new-onset type 2 diabetes, and deterioration of glycemic control this risk gradually declines over time and not mitigate the benefits of smoking cessation on decreasing the total and cardiovascular mortality.<sup>[24,25]</sup> Patients surveyed admitted that their source of information about smoking hazards were media (72.2%), friends (65.3%), family (61.1%), and doctors (59.7%), but only 5.3% of the current smokers and none of the ex-smoker admitted that doctors' advice was the main reason for smoking cessation.

Several studies have shown the importance of physicians in assisting patients in their smoking cessation efforts. The lack of time in the busy clinic may preclude physicians from playing an active in smoking cessation. Although newly diagnosed diabetics are usually motivated, at the time of diagnosis, to seek healthier lifestyles, including quit smoking, even when motivated, there are relapses and failures. Our study has shown that most smokers have failed past quit trails. Smoking quitting is a dynamic process rather than a single event, the presence of professional support increases the long-term success rate.<sup>[23,26]</sup> Tobacco cessation programs that provide assistance, advise, and follow up for smokers will increase the percentage of sustained abstinence. Implementation of regulations such as cigarette excise taxes can discourage young people from starting tobacco use and help smokers quit.<sup>[27]</sup>

The study has some noteworthy limitations; a cross-sectional study design, data being collected by the questionnaire are prone to recall and response bias, the questionnaire was administered by interviewers and thus there was a risk of interviewer bias, and the small sample size and clinic-based settings may not reflect the general prevalence and attitude to smoking among people with diabetes.

## CONCLUSIONS

The prevalence of smoking among Libyan diabetic patients is high; this calls for adopting education campaigns on smoking

hazards. Despite patients' awareness of the health hazards of smoking and their attempts to quit smoking, failure to maintain permanent abstinence points to the need to establish smoking cessation clinics in diabetes care facilities. A larger trials on tobacco use among the Libyan diabetic patient will help to understand its burden in this high-risk group and will set an important foundation for health authorities and policymakers to formulate prevention and control strategies.

### Author contribution

Single author.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

### Compliance with ethical principles

Ethical approval was obtained from institutional authorities of Tripoli Medical Center. Verbal consent was taken from all participants.

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### Reviewers:

Issam M Hajjaji (Tripoli, Libya)  
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