IOSR Journal Of Pharmacywww.iosrphr.org
(e)-ISSN: 2250-3013, (p)-ISSN: 2319-4219
Volume 6, Issue 11Version. 2 (Nov 2016), PP. 73-80

Pattern of Risk Factors for Non-Communicable Diseases (NCD) in Kabul city: A Community Survey using WHO STEP-Wise Approach

Khwaja Mir Islam Saeed (MD, MSc) [1], Mohammad Hafez Rasooly (MD, MSc) [2]

[1]*Head of Grant and Service Contract Management Unit (GCMU), Ministry of Public Health, Kabul-Afghanistan, Tel: 0093700290955,* [2]*Influenza Surveillance Officer, Surveillance Department, Ministry of Public Health*

ABSTRACT:-Background: The non-communicable diseases (NCDs) are emerging pandemic which poses a major health challenges to health systems globally. This study assessed the distribution of key risk factors of NCD among the Kabul adult population in Afghanistan.

Methods and Materials: A provincial cross-sectional survey was conducted in November 2015 on the prevalence of NCD risk factors using the WHO STEPS tool. A multistage cluster sampling method was used to randomly select the 1200 participants.The study analysed sample of 1172 adults of age group 25-70 years. Demographic, socioeconomic and behavior data were collected using a structured questionnaire. Fasting venous blood sample was collected to assess the lipid profile and fasting blood sugar.

Results: Out of study subjects, 599 (51.1%) were females and 573 (48.9%) males with a general mean age of 38.6±12.2 years. Illiteracy rate was (49.6%) and 77.5% were married. Prevalence of smoking and snuff use were 8.1% and 9.8% respectively. 33.6 % and 34.7% were taking fruits and vegetables three days or more weekly. 9.4% and 20.3% were practicing vigorous and moderate physical activity correspondingly. Almost more than half (57.6%) of study respondents were overweight and obese and 9.1% were recorded raised blood sugar. The prevalence of hypertension and raised blood sugar among adult Kabul citizens was 32.3% and 9.1% respectively. Central obesity was 60 % prevalent among citizens. High level of total cholesterol, LDL, HDL and triglycerides were 30.3%, 42 2%, 52% and 41% accordingly.

Conclusion: The high prevalence of overweight and obesity, hypertension, raised blood sugar, central obesity and low levels of taking fruits and vegetable consumption are evidently important among citizens in Kabul. Prevention, treatment and control of NCDs and their risk factors in Kabul is a significant public health problem in the country. A set of interventions with a multi focused multi-sectoral approach need to be designed and implemented.

Keywords: *Non-communicable diseases, risk factors, prevalence, WHO STEPwise approach, Kabul, Afghanistan*

I. INTRODUCTION

Globally changes occur in profile of diseases. The burden of noncommunicable diseases (NCD) is currently a major challenge with human, social and economic consequences particularly in low and middle-income countries. Furthermore according to estimations it is predicted to be great public health problem in future [1-2]. Total deaths due to NCDs contributed 63% of the 57 million global deaths in 2008 and 69% of total deaths in 2012; and the projections shows an increase of further 17% over the next 10 years [3-4]. The NCDs kill population in younger age in Eastern Mediterranean Region (EMR) countries. In EMR up to 50% die from such diseases before the age of 60 years compared with less than 10% in Western Europe [5].Nearly 54 % of death occurred due to the NCDs in South East Asian Region [6]. Moreover NCDs have their own economic burden skewed towards low income countries [7-8]. Focusing on four main factors including tobacco use, physical inactivity, unhealthy diet and the harmful use of alcohol could substantially reduce the burden of NCDs [9].According to World Health Organization (WHO) NCDs are estimated to account for 37% of total deaths in Afghanistan. However in neighbouring countries it accounts for 62% of all deaths in Tajikistan, 79% of all deaths in Uzbekistan, 50% of deaths in Pakistan, and 76% of total deaths in Iran and Turkmenistan [10]. The probability of dying in age group of 30-70 due to main NCDs were 31.3% and 30.5% in 2010 and 2012 respectively in the country [2]. This was further supported by Afghanistan mortality survey (AMS) 2010 that 33.3% of all deaths in the country were attributed to NCDs [11]. Furthermore WHO estimates the number of diabetes, for instance, is expected to rise to nearly threefold in 2030 as compared with 2000 [12]. In a study among men aged 15 years and older in Kabul city the prevalence of smoking was 35% [13], while another study on prevalence and risk factors of NCDs among the older adult population (aged ≥ 40 years) in Kabul city in

2012, reported the prevalence of diabetes mellitus to be 13.3%, obesity was 31.2% and hypertension 46.2% [14]. A recent study on NCDs in
Jalalabad city an eastern big city of the country showed that the prevalence of overweight/obesity, diabetes and hypertension were 57.4%, 11.4% and 24.4% respectively. Among respondents, 8.0% reported being current cigarette smokers and 13.7% used mouth snuff; 69.8% and 19.6% had < 3 servings of fruits and of vegetables respectively in a week; and 33.5% and 57.8% reported vigorous and moderate physical activity respectively [15]. Recent NCD survey in 2015 in Hirat city among adult citizens of ≥ 25 years shows that 83% ate fruits less than 3 days per week and 71.4% took vegetables three days per week, almost 10% practiced vigorous physical activity and 21.6% reported doing moderate physical activity. Almost half of study respondents were overweight and obese and 52.3% were suffering from central obesity. Prevalence of blood pressure was 35.6% raised blood sugar was 9.9%, 28.4% had higher cholesterol and 45% had higher triglycerides. Furthermore high level of low density lipoprotein (LDL) and high density lipoprotein (HDL) were both 47% in both groups [16]. Although National policy for NCDs is recently designed in the country [17] but due to insufficient data it is not rich enough, while the condition could be imagined through studies conducted in neighbouring countries such as Pakistan and the Islamic Republic of Iran which have similar background [18-22]. This study aimed to identify the prevalence of risk factors for chronic NCDs in the urban adult's population of Kabul city, the capital of Afghanistan.

II. METHODS AND MATERIALS

Study Design and Population:

A cross-sectional study was conducted in November 2015 using the WHO STEP-wise approach. The instrument wasadapted which prescribes three steps for measuring NCD risk factors. STEP I measures behavioural risk factors, STEP II covers physical measurements, and STEP III measures biological risk factors [23]. All permanent residents and household members aged (25-70) years, including men and women who gave consent were included in the study. Temporary residents (resident < 6 months), inhabitants of institutionalized settings and insecure areas were excluded. Assuming the highest prevalence (50%), 95% confidence interval (CI) and margin of error of 5%, a sample size of 385 subjects was calculated to include in the study. However, considering the proportion of other risk factors and design effect (D_{eff} of 2) of cluster sampling the final sample size was increased to (2 × 600) = 1200 for the city.

Sampling Techniques and Strategy:

As the total and complete list of villages were not available, the 2015 Expanded Programme for Immunization (EPI) list of clusters was used as the sampling. The EPI list is practically used for immunization in Afghanistan currently. We used multistage cluster sampling; in the first stage, from the list we conventionally selected five districts using random number in excel sheet. In the second stage from each selected district we randomly selected the 2 cluster; later the overall sample of 1200 household distributed among these selected area (Guzar) according to the proportion to the size of household number in each districts/ areas. Finally, the number of households in each area divided by the sample size assigned for each areas, it enabled the team to select household systematically.

***Data collection*:**

The adapted questionnaire used by interviewers which covered information on demographic, behavioral and physical measurements. Using structured and field tested questionnaires the experienced and trained data collectors as couples (males and females) were recruited and trained to fill the forms, measure hypertension and waist circumference and collect blood samples in the field. A household was defined as a group of people who share the same food pot (not the same roof). In households with more than one eligible person, we used a lottery system to select only one respondent. Anthropometric measurements including height and weight were used to calculate body mass index (BMI). A BMI ≥ 30 kg/m^2 was considered asobese, 25–30 kg/m^2 as overweight and 18.5–25 kg/m^2 as normal weight [24]. A waist circumference of 94 cm for men and 80 cm for women was defined as central obesity [25]. Systolic blood pressure (SBP) 140 mmHg and diastolic pressure (DBP) 90 mmHg were considered as hypertensive. Furthermore SBP of less than 120 mmHg and DBP of less than 80 mmHg were calculated hypotensive while the group between the two were considered as pre-hypertensive [26]. Blood samples were collected the next morning after the respondent had fasted for 10–12 hours and were transported in cold boxes (2-8°C) from field to Central Public Health Laboratory (CPHL) in Kabul. A fasting blood sugar of ≥ 126 mg/dL was considered as diabetes mellitus [27]. The cut off for total biochemical markers was determined as: cholesterol 190 mg/dL, low density lipoprotein (LDL) was 100 mg/dL, high density lipoprotein (HDL) for male 40 mg/dL and female 50 mg/dL, and finally triglycerides 150 mg/dL. Data management and analysis was done using *Epi-info*, version 7 and *SPSS*, version 20.

Ethical consideration:

For this study a general approval was given by the institutional review board (IRB) of the Ministry of Public Health and informed consent was taken from each individual before the interview. The results of physical and biochemical measurements communicated to required participants and the confidentiality of the information gathered was maintained. All blood samples were stored under -80°C in CPHL after completing biochemical measurements for further testing.

III. RESULTS

In total we included 1202 adult individuals in the study of which for 30 records either epidemiological data or blood samples were not available and discorded, therefore analysis were conducted on 1172 records. Out of these, 599 (51.1%) were females and 573 (48.9%) males with a total mean age of 38.6±12.2 years; three-fourth (75%) of the study participants were aged less than 45 years. Approximately half of the respondents (49.6%) were illiterates. Majority of the study participants were married (77.5%), while 60% of women were housewives (Table 1).Table 2 represents the prevalence of various behavioral risk factors for NCD; 8.1% of the study participants were current smokers and about half of them had smoking duration of 10 years. Similarly, the general prevalence of snuff use was (9.8%) predominantly among males while it was diluted due to low prevalence of snuff use in females (2%). Sixty six percent ate fruits and 65%% ate vegetables less than three days per week. More than half (52%) of the participants used solid oil and 33% used liquid oil for cooking in their kitchen. Almost ten percent of the respondents practiced vigorous physical activity and 20.3% reported doing moderate physical activity. Approximately half (48%) of the respondents reported to walk or use bicycle for 10 minutes per day. Forty six percent of respondents (46.8%) recorded a reclining of three hours or more per day.Table 3 illustrates the prevalence of pathophysiological risk factors of study participants. About 57.5% of study respondents were either overweight or obese as combined and (60%) were suffering from central obesity. Only 11.6% and 56.1% of the respondents had low or normal blood pressure respectively while 32.2% had high blood pressure. Nine percent recorded as raised blood sugar of them the prevalence of diabetes 9.3% was for females and 8.9% for males. Approximately 30% had higher total cholesterol (TC) and 41% had higher triglycerides (TG). Furthermore, high level of low density lipoprotein (LDL) and low level of high density lipoprotein (HDL) were revealed in 42.2% and 48% of study respondents respectively.

IV. DISCUSSION

Despite of belief that NCDs are problem of affluent population, the findings of this study shows, being a low-income country, Afghanistan is suffering from high burden of noncommunicable diseases. Mostly due attention is given practically on communicable diseases in the country [28-29) while the burden of NCD is loaded on its fragile economy. The findings of this study provides information on all sorts of risk factors, except alcohol harm use, for NCDs which are not prevalent in Afghanistan. Tobacco use is moderate and there are several forms of consumption among population such as cigarette smoking, Shisha smoking, snuffing in mouth and nose etc. Prevalence of cigarette smoking and snuff use were 8.1% and 9.8% respectively. This high percentage is more skewed toward men because the prevalence among female is almost none mainly due to the cultural unacceptability of these practices among women. Having young generation more as compare to other age categories (50% of 25-35 years) could expose the adult population to tobacco use. Low cost of mouth snuff could be the reason for more use of it. Such differences are supported by other studies [30-31]. Tobacco use in terms of snuffing is comparable with Kabul, Jalalabad and Herat studies [14-16] in the country.Sex differences in risk factors were also demonstrated in Karachi in Pakistan [32] that is probably due to same cultural backgrounds. Our study revealed that almost one third of study subjects used 3 days or more in a week fruits and vegetables per week. The level of strong and moderate physical activity was one tenth and one fifth in study population while half were using bicycle or walking by foot 10 minutes per day. Whereas 46% were reclining at home for 3 or more hours per day. These findings are lower as compare to Kabul and Jalalabad studies [14-16]. Physical inactivity is the fourth leading risk factor for global mortality and has major implications on the NCDs, particularly cardiovascular diseases and the general health. It seems majority of participants didn't exercise which could be due to low awareness or less availability of open space in cities. It has been supported by earlier studies [14-16, 33]. Therefore there is a need to sensitize and actively promote physical activity in this city as well as similar populations. The findings shows approximately more than half of the adults in Kabul city were suffering from overweight and obesity (57%). These findings are supported by other studies conducted in Kabul and Jalalabad [14-16] as well as other reports [32, 34-35]. Also, females had higher BMI and waist circumference than men which put them at higher risk of NCDs. Central obesity was two times more prevalent in women as compare to men which looks a significant findings and require more analytic researches. This could be related to cultural issue in Afghan context on access to physical exercise facilities and restriction female movement outside the homes. Probably lack of awareness and considering being obese as healthy generally they are reluctant to lose weight. In this study one third of subjects were suffering from hypertension

which in an earlier study in same city the prevalence of hypertension was 46.0% [14] and in Jalalabad [15] the prevalence of hypertension was 28.4% which are comparable. Much higher prevalence of hypertension in previous Kabul study as compare to current one could due to age differences taken into account. These findings are consistent with a studies in Iran and Pakistan [20, 36]. Furthermore 9% of population has raised blood sugar which is consistent with other studies in the country [14-15]. In Punjab province in Pakistan the prevalence of diabetes was reported to be 12.1% in males and 9.8% in females which support the findings [19]. Focusing on findings of prevalence of risk factors and their impact among population we can encourage education campaigns to raise awareness on physical activity as and healthy diet as protective factors against all NCDs are recommended. Kabul city, being overcrowded in recent years, has very limited jogging as well as aerobic sport centres. Establishment of such facilities, which are lacking in urban settings particularly for women, is encouraged. Study shows that NCDs occur as a combined syndrome in the adult population meaning that many risk factors are existing in one individual. Therefore interventions are needed to target a group of risk factors rather than just one or two factors. Despite of these findings financial constraints which prevented listing of the households ahead of study, overestimation of NCD burdens due to free checking of blood pressure and blood testing, and poor security situation which forced us to exclude some areas were main limitations. However the findings of this study fill the gaps of information for policy development and the design of interventions. The findings pave the way for a nationwide study on NCDs using WHO STEP wise approach to provide full information at country level.

V. ACKNOWLEDGEMENTS

The team would like to thank Surveillance Department at the Ministry of Public Health and the WHO Kabul office for supporting the study. The CPHL is acknowledged for their processing and testing of biochemical samples.

REFERENCES

[1] World Health Organization. Preventing chronic disease: a vital investment. Geneva: WHO; 2005.

[2] WHO (2014) Global status report on non-communicable diseases 2014 Geneva: World Health Organization.

[3] World Health Organization. (2008). 2008-2013 Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases. In World Health Assembly document (A61/8):

[4] World Health Organization. Global Health Estimates: Deaths by Cause, Age, Sex and Country, 2000-2012. Geneva, WHO, 2014.

[5] The Political Declaration of the United Nations General Assembly on the Prevention and Control of Non-Communicable Diseases: Commitments of Member States and the way forward .Technical Discussion paper. Fifty-ninth session of the Regional Committee for the Eastern Mediterranean, August2012. Provisional agenda item 4(a) (EM/RC59/3) (http://applications.emro.who.int/docs/RC_technical_papers_2012_3_14578_EN.pdf, accessed 29 July 2015).

[6] Salehuddin M, Choudhury KN, Islami N, Zillurahman M, Gosh S, Majib M. Burden of Non-communicable diseases in South Asia – A clinical review. University Heart Journal.2010, July; 6(2).

[7] Global status report on noncommunicable diseases 2010.Geneva: World Health Organization; 2011 (http://www.who.int/nmh/publications/ncd_report_full_en.pdf, accessed 29 July 2015).

[8] Kankeu HT, Saksena P, Xu K, Evans DB. The financial burden from noncommunicable diseases in low- and middle-income countries: a literature review. Health Res Policy Syst. 2013 Aug 16;11:31 PMID:23947294

[9] Health systems strengthening in countries of the Eastern Mediterranean Region: challenges, priorities and options for future action. Technical discussion paper. Fifty-ninth session of the Regional Committee for the Eastern Mediterranean, October2012 (EM/RC59/Tech.Disc.1) (http://applications.emro.who.int/docs/RC_technical_papers_2012_Tech_Disc_1_14613_EN.pdf, accessed 20 December 2013).

[10] World Health Organization - Noncommunicable Diseases (NCD) Country Profiles, 2014.

[11] Afghanistan mortality survey 2010. Calverton (MD): Afghan Public Health Institute, Ministry of Public Health, Central Statistics Organization (Afghanistan), ICF Macro, Indian Institute of Health Management Research and World Health Organization Regional Office for the Eastern Mediterranean; 2011 (http://dhsprogram.com/pubs/pdf/FR248/FR248.pdf, accessed 29 July 2015).

[12] World Health Organization, Diabetes programme Country and regional data on diabetes Prevalence of diabetes in the WHO Eastern Mediterranean Region. (http://www.who.int/diabetes/facts/world_figures/en/index2.html. accessed 29 July 2015)

[13] Mohmand. K.A, Sharifi K, Bahram A.A. Smoking prevalence survey in Kabul City. Kabul. Social and Health Development Program.2010 (in press).

[14] Saeed KMI. Prevalence of risk factors for NCDs in the adult population of urban areas in Kabul city, Afghanistan. Cent Asian J Glob Health.2013;2(2): 10.5195/cajgh.2013.69

[15] Saeed KMI, Rasooly MH, Alkozai A. Prevalence of risk factors for noncommunicable diseases in Jalalabad city, Afghanistan, evaluated using the WHO STEP-wise approach. EMHJ. 2015; 21(11)

[16] Saeed KMI, Rasooly MH. Prevalence of Risk Factors for Non-Communicable Diseases (NCD) Using WHO STEP-Wise Approach in Herat City Afghanistan. IOSR Journal of Pharmacy (e)-ISSN: 2250-3013, (p)-ISSN: 2319-4219, www.iosrphr.org, IOSR 2016; 6(10) PP.34-40

[17] Ministry of Public Health, National Health Policy (2015-2020), Kabul Afghanistan

[18] Esteghamati A, Meysamie A, Khalilzadeh O, Rashidi A, Haghazali M, Asgari F, et al. Third national surveillance of risk factors of NCDs (SuRFNCD-2007) in Iran: methods and results on prevalence of diabetes, hypertension, obesity, central obesity, and dyslipidemia. BMC Public Health.2009; 9:167. PMID: 19480675

[19] Basti A, Fawwad A, Hakeem R, Ahmedani MYM, Zafar M. Pakistan National Diabetes Survey: prevalence of glucose intolerance and associated factors in the Punjab province of Pakistan. Journal of Primary Care Diabetes Europe. (2010).4 (2); 79–83.

[20] Safdar S, Omair A, Faisal U, Hasan H. Prevalence of hypertension in a low income settlement of Karachi, Pakistan.J Pak Med Assoc. 2004Oct;54(10):506–9. PMID: 15552283

[21] Musaiger AO. Overweight and obesity in the Eastern Mediterranean Region: can we control it? East Mediterr Health J. 2004Nov; 10(6):789–93. PMID: 16335765

[22] Veghari G, Sedaghat M, Joshaghani H, Hoseini A, Niknezhad F, Angizeh A, et al. The prevalence of obesity and its related risk factor in the north of Iran in 2006.J Res Health Sci. 2010; 10(2):116–21. PMID: 22911934

[23] Bonita R, deCourten M, Dwyer T, Jamrozik K, Winkelmann R. Surveillance of risk factors for noncommunicable diseases: the WHO STEP-wise approach. Geneva: World Health Organization; 2002 (WHO/NMH/CCS/01.2002).

[24] Obesity: preventing and managing the global epidemic. Geneva: World Health Organization; 2000 (WHO Technical Report Series No. 894).

[25] The IDF consensus worldwide definitions of the metabolic syndrome. Brussels: International Diabetes Federation; 2006 (http://www.idf.org/webdata/docs/IDF_Meta_def_final.pdf, accessed 29 July 2015).

[26] Whitworth JA; World Health Organization, International Society of Hypertension Writing Group. World Health Organization (WHO)/International society of Hypertension (ISH) statement on management of hypertension. J Hypertens.2003Nov; 21(11):1983–92. PMID: 14597836

[27] Diabetes. Fact sheet no. 312. Updated January 2015.Geneva: World Health Organization; 2015 (http://www.who.int/mediacentre/factsheets/fs312/en/, accessed 29 July 2015).

[28] Health management information system (HMIS). In: Annual Report 1391. Kabul, Afghanistan: Ministry of Public Health; 2012

[29] Disease early warning system (DEWS) surveillance. In: Annual Report. Kabul, Afghanistan: Afghan National Public Health Institute, Ministry of Public Health; 2013.

[30] WHO STEPS. Chronic disease risk factor surveillance. Data book, I.R. Iran 1388 (2009) [Internet] (http://www.who.int/chp/steps/Iran_DataBook_2009.pdf?ua=1, accessed 29 July 2015).

[31] Pan B, Chen X, Wu X, Li J, Li J, Li Y, et al. Prevalence of noncommunicable diseases and their risk factors in Guangzhou, China. Prev Chronic Dis. 2014; 11:130091

[32] Stevens GA, Singh GM, Lu Y, Danaei G, Lin JK, Finucane MM, et al.; Global Burden of Metabolic Risk Factors of Chronic Diseases Collaborating Group (Body Mass Index). National, regional, and global trends in adult overweight and obesity prevalence. Popul Health Metr. 2012; 10(1):22–2. PMID: 23167948

[33] Nath A, Garg S, Deb S, Ray A, Kaur R. A study of the profile of behavioral risk factors of nonommunicable diseases in an urban setting using the WHO steps 1 approach. Ann Trop Med Public Health. 2009;2:15–9.

[34] Finucane MM, Stevens GA, Cowan MJ, Danaei G, Lin JK, Paciorek CJ, et al.; Global Burden of Metabolic Risk Factors of Chronic Diseases Collaborating Group (Body Mass Index). National, regional, and global trends in body-mass index since 1980: systematic analysis of health examination surveys and epidemiological studies with 960 country-years and 9•1 million participants. Lancet. 2011 Feb 12; 377(9765):557–67. PMID: 21295846

[35] Garg A, et al. Prevalence of Risk Factors for Chronic Non-communicable Diseases Using WHO Steps Approach in an Adult Population in Delhi. J Family Med Prim Care. 2014 Apr-Jun; 3(2): 112–118.

[36] Haghdoost AA, Sadeghirad B, Rezazadehkermani M. Epidemiology and heterogeneity of hypertension in Iran: a systematic review. Arch Iran Med. 2008 Jul; 11(4):444–52.

Table 1: Frequency distribution of demographic characteristics of the study participants, Kabul city (N=1172)

Variables	Categories	Female		Male		Total	
		N	%	N	%	N	%
Age							
	25-34	301	50.3	291	50.8	592	50.5
	35-44	158	26.4	131	22.9	289	24.7
	45-54	89	14.9	76	13.3	165	14.1
	55+	51	8.5	75	13.1	126	10.8
Level of Education							
	Illiterate	370	62.8	205	36	575	49.6
	Primary and unofficial	86	14.6	116	20.4	202	17.4
	Secondary school	72	12.2	154	27	226	19.5
	High school and over	43	7.3	75	13.2	118	10.2
	Refused	18	3.1	20	3.5	38	3.3
Job Categories							
	Official Employees	53	8.9	120	21.1	173	14.8
	Students	7	1.2	10	1.8	17	1.5
	Private Business	5	0.8	50	8.8	55	4.7
	Worker/Farmer	1	0.2	76	13.3	77	6.6
	Jobless	9	1.5	52	9.1	61	5.2
	Housework	356	59.7	12	2.1	368	31.6
	Unable to work/DKN	165	27.7	250	43.9	415	35.6
Monthly Income in AFN							
	Less than 10000	5	3.8	11	13.9	16	7.6
	More than 10000	127	96.2	68	86.1	195	92.4
Marital Status							
	Single	54	9.1	82	14.5	136	11.7
	Married	460	77.7	437	77.2	897	77.5
	Widow/Widower	43	7.3	11	1.9	54	4.7
	Divorced	4	0.7	2	0.4	6	0.5
	Refused	31	5.2	34	6	65	5.6

Table 2: Frequency distribution of behavioral risk factors for noncommunicable diseases among the study participants, Kabul city (N=1172)

Variables	Categories	Female		Male		Total	
		N	%	N	%	N	%
Cigarette Smoking Status							
	No	595	99.5	480	83.9	1075	91.9
	Yes	3	0.5	92	16.1	95	8.1
Duration of smoking in years							
	< 10 years	7	100	56	50.5	63	53.4
	10 - 20 years	0	0	36	32.4	36	30.5

	≥ 20 years	0	0	19	17.1	19	16.1
Mouth Snuff Status							
	No	585	98	467	82.1	1052	90.2
	Yes	12	2	102	17.9	114	9.8
Fruit taking (days per week)							
	< 3	372	64.7	378	68.1	750	66.4
	≥ 3	203	35.3	177	31.9	380	33.6
Vegetables taking (days per week)							
	< 3	406	68.8	350	61.6	756	65.3
	≥ 3	184	31.2	218	38.4	402	34.7
Type of Kitchen Oil							
	Liquid	174	29.2	214	37.7	388	33.3
	Solid	326	54.7	281	49.5	607	52.1
	Both	95	12.3	70	12.3	165	14.2
	Refused	1	0.5	3	0.5	4	0.3
Vigorous Physical Activity							
	No	550	92.1	507	88.9	1057	90.6
	Yes	47	7.9	63	11.1	110	9.4
Moderate Physical Activity							
	No	449	75.1	481	84.5	930	79.7
	Yes	149	24.9	88	15.5	237	20.3
Pedal or bicycle for 10 Minutes per day							
	No	403	67.3	206	36	609	52
	Yes	196	32.7	366	64	562	48
Reclining/siting (hours per day)							
	< 3	296	52.1	301	54.3	597	53.2
	≥ 3	272	47.9	253	45.7	525	46.8

[1,2] One serving is amount of fruits or vegetables taken once, [3] Physical activity in ten minutes caused high heart beats or respiration, [4] Physical activity in ten minutes caused moderate heart beats or respiration

Table 3: Frequency of pathophysiological risk factors for NCDs of study participants, Kabul city (N=1172)

Variables	**Categories**	**Female**		**Male**		**Total**	
		N	%	N	%	N	%
Basic Mass index (in kg/m square)							
	Underweight[1]	16	2.7	17	3	33	2.8
	Normal weight[2]	211	35.2	254	44.3	465	39.7
	Overweight[3]	196	32.7	236	41.2	432	36.9
	Obesity I[4]	117	19.5	57	9.9	174	14.8
	Obesity II[5]	42	7	7	1.2	49	4.2
	Obesity III[6]	17	2.8	2	0.3	19	1.6
Central Obesity (excluding Pregnancy)							
	No	123	20.5	346	60.4	469	40
	Yes	476	79.5	227	39.6	703	60
Blood Pressure (including under treatment)							
	Hypotensive[7]	100	16.7	36	6.3	136	11.6
	Normotensive[8]	279	46.6	378	66	657	56.1
	Hypertensive[9]	220	36.7	159	27.7	379	32.2
Blood Sugar elevated[10] (Diabetes Mellitus including under treatment)							
	No	543	90.7	522	91.1	1065	90.9
	Yes	56	9.3	51	8.9	107	9.1

Total Cholesterol							
	<190 mg/dL	409	68.3	408	71.2	817	69.7
	≥ 190 mg/dL	190	31.7	165	28.8	355	30.3
LDL							
	<100 mg/dL	348	58.1	330	57.6	678	57.8
	≥100 mg/dL	251	41.9	243	42.4	494	42.2
HDL(borderline 40 mg/dL for male and 50mg/dL for female)							
	<40 and 50mg/dL	233	38.9	330	57.6	563	48
	≥40 and 50mg/dL	366	61.1	243	42.4	609	52
Triglycerides (missing=25)							
	<150 mg/dL	362	60.4	329	57.4	691	59
	≥150 mg/dL	237	39.6	244	42.6	481	41

[1] BMI <18.5, [2] BMI 18.5-24.9, [3] BMI 25-29.9, [4] BMI 30-35, [5] BMI 35-40, [6] BMI >40, [7] Systolic Blood Pressure (SBP) 120mmHg and Diastolic Blood Pressure (DBP) 80mmHg, [8] SBP 120-140mmHg and DBP 80-90mmHg, [9] SBP≥140mmHg and DBP≥ 90mmHg, [10] FBS ≥ 126mg%