Prevalence and Correlates of Cardiovascular Health Status among Adults in Afghanistan: Results of a National Survey in 2018

Abstract

Background: The aim of the study was to assess the prevalence and correlates of cardiovascular health (CVH) status among adults in Afghanistan. **Methods:** In a national cross-sectional household survey 3,447 adults completed CVH measurements in Afghanistan. Criteria for ideal CVH (ICVH) were physical activity, healthy diet, non-smoking, fasting blood glucose (<100 mg/dL), body mass index (<25 kg/m^2), total cholesterol (<200 mg/dL), and blood pressure (<120/<80 mmHg). **Results:** More than one-third (34.3%) of participants had 5-7 ICVH, 45.7% 3-4 ICVH, and 20% had 0-2 ICVH. In adjusted logistic regression analysis, secondary or more education (AOR: 1.80, 95% CI: 1.22-2.66) was positively associated, and older age (45-69 years) (AOR: 0.33, 95% CI: 0.26-0.42), and urban residence (AOR: 0.67, 95% CI: 0.51-0.88) were inversely associated with 5-7 ICVH. **Conclusions:** The prevalence of ICVH was low in Afghan adults. Population measures may be used to improve CVH targeting identified associated factors.

Keywords: *Adults, Afghanistan, cardiovascular health, population survey*

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Introduction

Almost one-third of global death can be attributed to cardiovascular diseases (CVDs), such as ischaemic heart disease and stroke.[1] Most of the CVD death (>75%) occur in low-resourced countries.[1] One in five individuals died from CVDs in 2016 in Afghanistan,[2] which is a low-income country with a low adult literacy rate (43%).[3]

Ideal cardiovascular health (ICVH) includes seven ideal health behaviors and factors, including physical activity, healthy diet, non-smoking, fasting blood glucose (<100 mg/dL), body mass index (<25 kg/m^2), total cholesterol (<200 mg/dL), and blood pressure (<120/<80 mmHg).[4,5] Studies showed that persons with a higher number of ICVH have a lower morbidity and mortality risk.[6] The ICVH status in Afghanistan is unknown, which, however, is needed for decision makers to enable them to provide specific preventive health policies to enhance CVH.

Global data from a systematic review show that 19.6% of the adult population had 5-7 ICVH, and 32.2% had 0-2 ICVH.[7] For example, in a national sample (≥20 years) in China 33.0% had 5-7 ICVH,[8] and in Nepal (15-69 years), 51.6% had 5-7 ICVH metrics.[9] Social and demographic factors associated with ICVH may include female gender,[7,9] decreasing age,[7,9,10] socioeconomic status,[10] and rural residence.[11] The aim of the study was to assess the prevalence and correlates of CVH status among adults in Afghanistan in 2018.

Method

Sample and procedures

This paper uses secondary data from the 2018 Afghanistan cross-sectional STEPS survey in 2018.[12] Using a three-stage cluster sampling approach (1:55 districts, 2: villages or blocks, and 3: households), a nationally representative sample of individuals 18-69 years was generated.[13] At the household level one adult (18-69 years) was randomly selected.[13] The "Ministry of Public Health Ethics Board" granted ethics approval, and participants gave written informed consent.[13] From 3,447 of 3,956 participants complete information was available on ICVH measures: "smoking status, body mass index (BMI), physical

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activity (PA), diet, total cholesterol (TC) and fasting blood glucose (FBG), and blood pressure (BP)."

Measures

Using the American Heart Association (AHA) classification,[4,5] levels of ICVH for "smoking, BMI, PA, diet, TC, BP, and FBG" were assessed.

Cardiovascular health behavior

Smoking status: "poor if current smoker, intermediate if a past smoker, and ideal if self-report of never having smoked."

Body Mass Index (BMI) was determined by using standardized anthropometric measurements.[13] BMI was "defined poor if $\geq 30\,kg/m^2$, intermediate as $25.0–29.9\,kg/m2$, and ideal BMI is $<25\,kg/m^2$."

Healthy diet: "Poor healthy diet is defined as <2 servings of fruit and vegetables (FV)/day, intermediate as 2-<4.5 FV/day, and an ideal diet as ≥ 4.5 FV servings/day."[14]

Physical activity (PA): "Poor = None, Intermediate = 1–149 min/wk moderate intensity or 1–74 min/wk vigorous intensity or 1–149 min/wk moderate + vigorous, ideal = ≥ 150 min/wk moderate intensity or ≥ 75 min/wk vigorous intensity or ≥ 150 min/wk moderate + vigorous." PA was sourced from the "Global Physical Activity Questionnaire."[15]

Cardiovascular health factors

Total cholesterol (TC): poor is "TC $\geq 240\,mg/dL$, intermediate is TC $200–239\,mg/dL$ or treated to TC $<200\,mg/dL$ and ideal TC is $<200\,mg/dL$ and without any cholesterol-lowering medication." TC levels were determined by an enzymatic method.[13]

Blood pressure (BP) (mean of 2 of 3 readings): poor is "BP $\geq 140/\geq 90\,mmHg$, intermediate is systolic BP 120–139 mmHg or diastolic BP 80–89 mmHg or treated to BP $<120/<80\,mmHg$, and ideal BP is defined as BP $<120/<80\,mmHg$ and without any antihypertensive medication."[13]

Fasting blood glucose (FBG): poor is "glucose $\geq 126\,mg/dL$, intermediate is glucose 100–125 mg/dL or treated to $<100\,mg/dL$, and ideal is $<100\,mg/dL$ and without any glucose-lowering medication." FBG levels were determined by glucose oxidase method.[13]

The seven CVH components were each classified as 1 = ideal, and 0 = not ideal, and grouped into 0-2, 3-4, and 5-7 ICVH without any previous CVD.

History of CVD was based on a positive response to the question, "Have you ever had a heart attack or chest pain from heart disease (angina) or a stroke (cerebrovascular accident or incident)?"[12]

Social and demographic information consisted of educational level, sex, age, residence status, and number of adult members in household (as indicator for economic status).[13,16]

Statistical procedures

Differences in proportions were calculated using Pearson Chi-square tests and Student's t-tests for men differences. Logistic regression was used to estimate predictors of 5-7 ICVH. $P < 0.05$ was considered significant. Using "STATA software version 14.0 (Stata Corporation, College Station, TX, USA)" statistical analyzes were applied, considering the multi-stage sampling and weighting of the data.

Results

Participants

The participants were 3,447 18-to-69-year-olds (median age: 32 years; IQR 23-43), 55.4% were male, 59.9% had no education, 56.3% resided in urban areas, and 60.1% had ≥ 5 adult household members. Compared to men, women had lower education, higher self-reported hypertension, higher BMI, total cholesterol and FBG [see Table 1].

Proportion of ICVH

One in five (20%) of respondents had 0-2 ICVH, 45.7% had 3-4 ICVH, and 34.3% had 5-7 ICVH; 0.5% had zero, 3.7% one, 8.5% two, 20.1% three, 29.6% four, 27.5% five, 10.0% six, and 0.25 all seven ICVH. A significant larger proportion of women had ideal smoking, ideal diet, and ideal blood pressure than men, while men had significantly higher ideal BMI, physical activity, and total cholesterol than women. [see Table 2].

Associations with 5-7 ICVH

In adjusted logistic regression analysis, secondary or more education (Adjusted Odds Ratio-AOR: 1.80, 95% Confidence Interval-CI: 1.22-2.66) was positively, and older age (45-69 years) (AOR: 0.33, 95% CI: 0.26-0.42), and urban residence (AOR: 0.67, 95% CI: 0.51-0.88) were inversely associated with 5-7 ICVH [see Table 3].

Discussion

In this national sample of 18-to-69-year-olds in Afghanistan, the prevalence of 5-7 ICVH (34.3%), was higher than globally (19.6%),[7] in Iran (16%),[17] similar to China (33.0%),[8] and lower than in Nepal (51.6%).[9] The proportion of ideal TC (87.2%), ideal smoking (85.1%), and ideal FGP (78.9%) were the highest and healthy diet (3.3%) and ideal BP (31.5%) were the lowest in this study, which compares with global results.[7] The estimates of ideal PA (55.3%) and ideal BMI (57.1%) in this study seem higher than global figures of PA (40.6%) and BMI (40.3%).[7] In local studies in Afghanistan, a lower prevalence of ideal BMI has been observed, e.g., in Kabul (25-70 years, in 2015) (42.4%),[18] in Jalalabad (25-65 years) (42.6%),[19] and in five major cities (25-70 years) (47.3%).[20] The low prevalence of ideal PA (31.5%) in this national study seems

Table 1: Sample characteristics of participants aged 18-69 years, Afghanistan, 2018

Variable	n (%)		
	Total	Men	Women
All	3447	1868 (55.4)	1579 (44.6)
Age in years			
18-29	1232 (43.1)	642 (44.5)	590 (41.4)
30-44	1044 (32.7)	514 (33.0)	530 (32.4)
45-69	1147 (24.1)	699 (22.5)	448 (26.2)
Education			
None	1932 (59.9)	751 (44.6)	1181 (78.7)*
Primary or less	594 (16.4)	413 (21.1)	181 (10.7)
Secondary or more	921 (23.7)	704 (34.3)	217 (10.6)
Adult household members			
1-2	660 (10.8)	367 (12.0)	293 (9.4)
3-4	1160 (29.1)	623 (29.4)	537 (28.8)
≥5	1627 (60.1)	878 (58.6)	749 (61.8)
Residence			
Rural	1661 (43.7)	935 (42.8)	726 (44.8)
Urban	1786 (56.3)	933 (57.2)	953 (55.2)
Self-reported CVD	258 (9.7)	165 (11.8)	93 (7.1)
Self-reported diabetes mellitus	333 (7.3)	122 (7.5)	92 (7.0)
Self-reported hypertension	752 (23.1)	299 (16.5)	453 (31.2)*
Self-reported high cholesterol	214 (10.1)	149 (6.7)	184 (14.4)*
Use of anti-hypertensive drug	444 (15.1)	170 (8.6)	274 (23.0)*
Use of hypoglycemic drug	71 (1.8)	54 (0.8)	17 (3.0)
Use of lipid-lowering drug	52 (2.3)	21 (1.3)	31 (3.6)
	M (SD)	M (SD)	M (SD)
Mean systolic blood pressure, mmHg	126.3 (16.2)	126.7 (16.2)	125.8 (19.4)
Mean body mass index, kg/m^2	25.2 (6.0)	24.4 (5.0)	26.1 (7.0)*
Mean total cholesterol, mg/dl	146.6 (39.9)	140.5 (37.5)	154.2 (41.5)*
Mean fasting plasma glucose, mg/dl	88.9 (28.8)	86.5 (28.8)	91.1 (40.4)*

* $P < 0.05$, men versus women

to be confirmed in local studies, e.g., in five major cities in Afghanistan (25-70 years, 32.4% hypertension),[19] and in Kabul (≥40 years, 46.2% hypertension).[18] The prevalence of poor smoking among men (14.5%) and among women (2.6%) in this study compares with a study in five major cities in Afghanistan (14.1% among men and 2.7% among women).[20]

In line with previous studies,[7,9-11] the prevalence of ICVH decreased with age, and increased with higher education, and those residing in rural areas. Unlike some previous studies,[7,9,10] this study did not find significant sex and economic status (proxy adult household members) differences in the prevalence of ICVH. The overall nonsignificant sex differences may be attributed to a higher rate of ideal smoking, ideal diet, and ideal BP among women than men, and a higher rate of ideal BMI, PA, and TC among men than women. To improve ICVH in the Afghan adult population, multidisciplinary interventions are needed targeting CVH behaviors, such as health promotion of diet, weight control, physical activity, and smoking cessation, as well as screening and management of high blood pressure and blood sugar.[17,20]

Study limitations

In contrast to the five components of the AHA healthy diet, this study only assessed one component (fruit and vegetable consumption), and future studies all components should be included. The measure of household income had too many missing cases, and we could therefore not include a better measure of economic status. Additional limitations refer to the cross-sectional design of the study and the self-report of some parts of data collected.

Conclusion

We found a low proportion of ICVH among the adult population in Afghanistan. Interventions targeting both the general population and identified risk groups should be implemented to improve ICVH in Afghanistan.

Acknowledgment

Table 2: Cardiovascular health (CVH) metrics distribution (prevalence, %)

Health metrics	Sub-category	Total sample (n=3447) %	Men (n=1868) %	Women (n=1579) %	Chi-square P
Smoking	Poor	9.2	14.5	2.6	<0.001
	Intermediate	5.7	9.2	1.4	
	Ideal	85.1	76.3	96.0	
Body mass index	Poor	17.1	11.8	23.7	<0.001
	Intermediate	25.7	25.9	25.5	
	Ideal	57.1	62.3	50.8	
Diet	Poor	58.9	54.6	64.2	0.013
	Intermediate	37.8	43.4	30.7	
	Ideal	3.3	1.9	5.1	
Physical activity	Poor	16.4	5.0	30.6	<0.001
	Intermediate	28.3	31.4	24.5	
	Ideal	55.3	63.6	44.9	
Total cholesterol	Poor	4.5	3.3	6.0	<0.001
	Intermediate	8.3	4.8	12.6	
	Ideal	87.2	91.9	81.4	
Blood pressure	Poor	25.2	21.8	29.3	<0.001
	Intermediate	43.4	50.3	34.8	
	Ideal	31.5	27.9	35.9	
Fasting plasma glucose	Poor	8.7	6.5	11.3	0.205
	Intermediate	12.5	12.7	12.1	
	Ideal	78.9	80.7	76.6	
Poor CVH (0-2 ideal metrics)		20.0	19.7	20.4	0.290
Intermediate CVH (3-4 ideal metrics)		45.7	45.3	46.1	
Ideal CVH (5-7 metrics)		34.3	35.0	33.5	

Table 3: Associations with meeting 5-7 ideal cardiovascular health metrics

Variable	Crude OR (95% CI)	P	Adjusted OR (95% CI) [1]	P
All				
Age in years				
18-29	1 (Reference)	0.009<0.001	1 (Reference)	0.037<0.001
30-44	0.60 (0.41, 0.88)		0.62 (0.40, 0.97)	
45-69	0.32 (0.15, 0.42)		0.33 (0.26, 0.42)	
Sex				
Female	1 (Reference)	0.677	1 (Reference)	0.528
Male	1.07 (0.79, 1.44)		0.89 (0.63, 1.27)	
Education				
None	1 (Reference)	0.795<0.001	1 (Reference)	0.832
Primary or less	0.96 (0.70, 1.32)		0.96 (0.67, 1.38)	0.003
Secondary or more	2.04 (1.40, 2.97)		1.80 (1.22, 2.66)	
Adult household members				
1-2	1 (Reference)	0.586	1 (Reference)	0.460
3-4	1.17 (0.66, 2.10)	0.446	1.23 (0.70, 2.16)	0.346
≥5	0.81 (0.47, 1.39)		0.77 (0.44, 1.33)	
Residence				
Rural	1 (Reference)	0.002	1 (Reference)	0.004
Urban	0.66 (0.52, 0.86)		0.67 (0.51, 0.88)	
Men				

Contd...

Variable	Crude OR (95% CI)	*P*	Adjusted OR (95% CI) [1]	*P*
Age in years				
18-29	1 (Reference)	0.120<0.001	1 (Reference)	0.225<0.001
30-44	0.64 (0.37, 1.12)		0.66 (0.33, 1.30)	
45-69	0.38 (0.27, 0.55)		0.38 (0.25, 0.59)	
Education				
None	1 (Reference)	0.145	1 (Reference)	0.074
Primary or less	0.76 (0.52, 1.10)	0.008	0.71 (0.49, 1.03)	0.078
Secondary or more	1.76 (1.16, 2.67)		1.49 (0.96, 2.33)	
Adult household members				
1-2	1 (Reference)	0.566	1 (Reference)	0.531
3-4	1.25 (0.58, 2.71)	0.756	1.28 (0.59, 2.77)	0.557
≥5	0.89 (0.42, 1.88)		0.79 (0.35, 1.76)	
Residence				
Rural	1 (Reference)	0.246	1 (Reference)	0.417
Urban	0.79 (0.53, 1.18)		0.84 (0.54, 1.29)	
Women				
Age in years				
18-29	1 (Reference)	0.003<0.001	1 (Reference)	0.011<0.001
30-44	0.55 (0.37, 0.81)		0.59 (0.39, 0.88)	
45-69	0.26 (0.15, 0.46)		0.27 (0.17, 0.44)	
Education				
None	1 (Reference)	0.191<0.001	1 (Reference)	0.186<0.001
Primary or less	1.51 (0.81, 2.79)		1.55 (0.81, 2.97)	
Secondary or more	3.14 (1.80, 5.52)		2.74 (1.53, 4.90)	
Adult household members				
1-2	1 (Reference)	0.824	1 (Reference)	0.471
3-4	1.06 (0.62, 1.83)	0.191	1.22 (0.71, 2.09)	0.331
≥5	0.71 (0.43, 1.19)		0.76 (0.44, 1.32)	
Residence				
Rural	1 (Reference)	<0.001	1 (Reference)	<0.001
Urban	0.53 (0.37, 0.76)		0.49 (0.32, 0.73)	

OR=Odds Ratio; CI=Confidence Intervals; [1]Adjusted for all variables in the table

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