Medications and Lifestyles of Patients with Cardiovascular Risk Factors and/or Disease in Turkish Patients (MedLife-TR)

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Abstract

Background and Aim: Lifestyles and behavoiral patterns of patients must be known to improve public health and to prevent cardiovascular diseases (CVD). In this study, we aimed to provide insights into the lifestyles and behavioral patterns of patients applied to outpatient cardiology clinics in Turkey. **Materials and Methods:** The participants completed a self-administered questionnaire about awareness of cardiovascular (CV) risk factors and individual CV risk levels, lifestyles, and medications. **Results:** A total of 2793 patients, 52.1% of females with a mean age of 57.0 ± 14.0 years were included. The most common risk factor was hypertension. The most common CVD was coronary artery disease. The calculated CV risk level of 1041 patients (37.3%) was high, while only 20.4% of all participants identified themselves as high risk. Participants were aware that hypertension, smoking, hyperlipidemia, diabetes, sedentary, family history, and aging were risk factors for CVD. About 44% of the patients reported that they used additional salt and the majority reported that they did not consume fast food. The most commonly prescribed CV drug was beta-blockers (44.9%) and 22.4% of patients were taking minimum of 5 drugs daily. **Conclusion:** The awareness of CV risk factors and risk levels is low in the study population. Guideline recommended medications and lifestyle changes are not sufficiently implemented.

Keywords: Cardiovascular, health, lifestyle, public, risk, Turkish

INTRODUCTION

Cardiovascular diseases (CVD) are the leading cause of death and major burden on health care systems.[1,2] CVD is primarily caused by metabolic, environmental, behavioral, and social risk

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factors. There are well-known established risk factors such as diabetes mellitus, hypertension, hyperlipidemia, smoking, stress, and sedentary life. While genetic factors contribute to the onset and progression of CVD, we are now aware that many of the cardiovascular (CV) risk factors are mediated by lifestyle. Diet, exercise, adherence to medications, sleep, and other environmental factors are also important to be healthy. Approximately 80% of heart disease, stroke, and Type 2 diabetes cases can be prevented by modifying undesirable lifestyle behaviors.[3,4]

A healthy lifestyle is well defined with a lower risk of CV and metabolic morbidity; hence lifestyle modification is a cardinal component of both personalized and public health. Several lifestyle intervention studies among patients at high risk revealed that changing lifestyle could reduce the risk of diabetes mellitus and improve CV health.[5-8]

The aim of this study was to provide insights into CV risk awareness, current lifestyle habits, drug usage, and medical behavioral patterns of Turkish patients with CV risk factors and/or diseases who admitted to outpatient cardiology clinics.

MATERIALS AND METHODS

Patients admitted to the cardiology outpatient clinics for diagnostic or therapeutic purposes, who were over 18 years of age and agreed to participate in the study were included. The participants signed informed consent and completed a self-administered questionnaire in the following sections: baseline characteristics, awareness of CV risk factors and individual CV risk, lifestyle habits, medical behaviors, and CV medication. Patients from 27 hospitals in different regions of Turkey participated between November 2018 and March 2019.

On physical examination, pulse rate and blood pressure were recorded. Actual CV risk levels were calculated by the physicians according to the Framingham risk score which is a simplified and common tool for the assessment of risk level of CAD over 10 years.[9] Office scale was used for weight measurements and body mass indexes were calculated by the formula recommended by the World Health Organization (ratio of weight and height, expressed as kg/m²).

Patients performing at least 30 min of moderate exercise at least 3 days a week were defined as regular exercisers. Patients were considered hypertensive if they were on antihypertensive medications or had high blood pressure on examinations (>140/90 mmHg), performed twice for confirmation. Blood pressure measurements were done as office measurements with validated digital sphygmomanometer. Patients were considered diabetic if they were using the antidiabetic medication, or had a fasting blood glucose higher than 126 mg/dL. Hyperlipidemia was diagnosed if the patients were taking lipid-lowering drugs or their lipid levels were high according to the hyperlipidemia guidelines.[10]

History of CV interventions (percutaneous coronary interventions or bypass grafting), myocardial infarction, dysrhythmia, peripheral arterial disease, valvular heart disease (moderate or severe), cerebrovascular diseases, renal diseases, medication (including over the counter drugs) were questioned and noted after searching the medical records of study subjects.

The electrocardiography (ECG) of each patient was evaluated by the cardiologist.

Ethical statement
The study was performed in compliance with the Declaration of Helsinki.[11] and ethics approval was obtained from the local ethics committee of Istanbul Bakırkoy Dr. Sadi Konuk Training and Research Hospital (16/09/2019, 2019-18-07).

Statistical analysis
All statistical analysis was conducted using MedCalc Statistical Software version 18 (MedCalc Software bvba, Ostend, Belgium; http://www.medcalc.org; 2018). Continuous variables were presented as mean, standard deviation (SD), median, minimum and maximum values and data on frequency were presented as percentage (%) for categorical variables. Chi-square analysis was used for correlation between categorical variables. Where appropriate, categorical variables were evaluated by Fisher exact and Fisher Freeman Halton Test. $P < 0.05$ was considered statistically significant. The summary of data analysis was shared as tables. Since it was an observational, noninterventional study, there were no specific hypotheses to be tested, no comparisons and no endpoints.

RESULTS

Baseline characteristics
A total of 2793 patients, 52.1% female with a mean age of 57.0 ± 14.0 years were included. Only 10.5% of patients were university graduates. The most common risk factor was hypertension (62.5%). The most common CVD was coronary artery disease with a prevalence of 35%. On ECG, most of the patients had sinus rhytm (93,3%) and atrial fibrillation prevalence was 6,3% [Table 1]. The mean systolic and diastolic blood pressure was 130.8 ± 19.3 mmHg, 78.1 ± 11.4 mmHg respectively.

Cardiovascular risk awareness
The calculated CV risk level of 1041 patients (37.3%) was high and only 20.4% of all participants identified themselves as high risk [Table 2]. Although the risk factor with the highest awareness was hypertension, only 31.5% of the participants knew that it was a risk factor for CVD. Among participants, the ratio of awareness about CV risk factors was 22.5% for smoking, 18.0% for diabetes mellitus, and 10.6% for hyperlipidemia, <10% of the participants knew that sedentary life, genetic history, and aging were also CV risk factors [Table 3].

Lifestyle habits
The mean body mass index was 28.4 ± 4.9 kg/m², the rate of regular exercise was 35.8% [Table 4]. Most of the

Table 1: Demographic and clinical characteristics of the study population

Variable	*n* (%)
Sex	
Male	1338 (47.9)
Female	1455 (52.1)
Age (years)	
20-39	354 (12.7)
40-59	1145 (41)
≥60	1294 (46.3)
Educational status	
Primary-secondary school	1360 (48.7)
High school	446 (16.0)
University	294 (10.5)
None	693 (24.8)
Heart rhythm	
Sinus	2606 (93.3)
Atrai fibrillation	175 (6.3)
Unknown	12 (0.4)
Hyperlipidemia	
Yes	736 (26.3)
No	2002 (71.9)
Unknown	55 (2.0)
Hypertension	
Yes	1747 (62.5)
No	1027 (36.8)
Unknown	19 (0.7)
Smoking	
Yes	851 (30.5)
No	1596 (57.2)
Unknown	345 (12.4)
Diabetes mellitus	
Yes	751 (26.9)
No	2035 (72.9)
Unknown	7 (0.2)
Renal failure	
Yes	130 (4.6)
No	2645 (94.7)
Unknown	18 (0.6)
Coronary artery disease*	
Yes	978 (35.0)
No	1798 (64.4)
Unknown	17 (0.6)
Stroke/TIA	
Yes	124 (4.4)
No	2646 (94.8)
Unknown	22 (0.8)
Peripheral arterial disease	
Yes	65 (2.3)
No	2680 (96.0)
Unknown	47 (1.7)
Heart failure	
Yes	367 (13.1)
No	2335 (83.1)
Unknown	91 (3.3)

Contd...

Table 1: Contd...

Variable	*n* (%)
Valvular disease (moderate-severe)	
Yes	229 (8.2)
No	2459 (88.0)
Unknown	105 (3.8)
Aortic valve diseases (stenosis or insuffiency)	
Yes	127 (4.5)
No	2550 (91.3)
Unknown	116 (4.1)
Mitral valve diseases (stenosis or insuffiency)	
Yes	351 (12.6)
No	2326 (83.3)
Unknown	116 (4.1)
Primary pulmonary hypertension	
Yes	20 (0.7)
No	2669 (95.6)
Unknown	103 (3.7)
Congenital heart diseases	
Yes	12 (0.4)
No	2699 (96.6)
Unknown	82 (2.9)
Pacemaker (VVI, DDD, VDD)	
Yes	18 (0.6)
No	2719 (98.8)
Unknown	15 (0.5)
ICD/CRT	
Yes	38 (1.4)
No	2701 (98.1)
Unknown	15 (0.5)

*History of myocardial infarctiın, percutaneous transluminal coronary interventin or coronary artery by-pass grefting. TIA: Transient ischemic attack, ICD: Implantable cardioverter defibrillator, CRT: Cardiac resynchronization therapy

patients (58.0%) stated that they did not skip any meal and didn't consume any fast food (53.9%). The most consumed bread types were white (61.0%) and bran (13.9%) bread. The frequency of using additional table salt was 44.1%. Despite 31.9% of the participants added no sugar to tea and/or coffee, 27.0% preferred 2 sugar cubes and 31.4% of them preferred 1 sugar cube. The herbal product and vitamin usage rates were low [Table 4].

Medical attitudes and drug use

Approximately one-third (36.7%) of all participants used to visit outpatient clinics with an interval of 3–6 months. More than two-thirds of participants (76.7%) get medical information from their doctors, not from medical television programs or Internet sources [Table 5]. When the drugs were examined, it was seen that only 7.6% of patients did not have a regular drug, whereas 70.0% of them were taking at least 1 drug daily and 22.5% of patients were taking more than 5 drugs per a day. Most of the patients (80.0%) stated that they use their drugs regularly (defined as using a prescribed medication suggested by the medical doctor without interruption till recovery or change in medication) [Table 5]. The most commonly used

Table 2: Assessment for cardiovascular risk

Variable	n (%)
Patients' self-reported cardiovascular risk level	
Low risk	876 (31.4)
Moderate risk	1347 (48.2)
High risk	569 (20.4)
Framingham risk level calculated by a physician	
Low risk	823 (29.5)
Moderate risk	928 (33.2)
High risk	1041 (37.3)

Table 3: Awareness of cardiovascular risk factors

Variable	n (%)
Hypertension	880 (31.5)
Hyperlipidemia	296 (10.6)
Smoking	629 (22.5)
Diabetes mellitus	502 (18.0)
Sedentary life	172 (6.2)
Heredity	166 (5.9)
Aging	146 (5.2)

drugs are shown in Table 6. The most commonly prescribed CV drug was beta-blockers (44.9%) followed by ASA (41.1%), renin-angiotensin-aldosterone system blockers, and statins. The statins were believed to be harmful by 38.4% of participants. The most common non-CV medications were proton-pump inhibitors (35.8%) and nonsteroidal anti-inflammatory drugs (24.1%).

DISCUSSION

In the present study, we found that the awareness of all CV risk factors is still low in our study population. In parallel with this, the calculated CV risk level of patients applied to cardiology outpatient clinics was high in most. CVD is the leading cause of death.[1] Although there are well-known established CV risk factors such as diabetes mellitus, hypertension, and hyperlipidemia which increase the risk of CVD, the researchers also described behavioral risk factors as well as clinically measured risk factors. Nonsmoking, high-quality diet, and exercise are in relation to a lower risk of CV and metabolic diseases.

The prevalence of CV risk factors in a population may vary, influenced by changes in lifestyle and medical behavior over time. According to the International Diabetes Federation Diabetes Atlas, approximately half a billion people worldwide have diabetes mellitus, with the number expected to rise by 25% in 2030 and 51% in 2045.[12] The prevalence of diabetes mellitus was reported to be 13.7% in the general Turkish population in the TURDEP study,[13] in our study population it was 26.9%. The reason for this difference may be the mentioned increase of global diabetes mellitus prevalence or the fact that our study was conducted among people who applied to cardiology outpatient clinics, and did not include

the general population. While the rate of hyperlipidemia in population aged over 50 years was reported to be 32% by Onat *et al.*,[14] mean age ± SD was 57.0 ± 14.0 years and hyperlipidemia prevalance was 26.3% in this study. Ozkara *et al.* showed that 75.4% of the population aged over 60 years was hypertensive.[15] However, the mean age of our study population was under 60 years and 62.5% of the patients were hypertensive. On the other hand, smoking prevalence was higher in our study population (30.5%) compared to the adult population (27.1%) based on the World Health Organization. Global Adult Tobacco Survey.[16]

Previous studies revealed that adherence to some healthy lifestyles were associated with a decreased risk of major coronary events.[17] At that point, the knowledge level of the population regarding healthy lifestyle and awareness of CV risk is important. Hence, American Heart Association works to reduce cardiac morbidity and mortality by improving public's knowledge level and management of modifiable risk factors. Our study results showed that the majority of Turkish patients who applied to the cardiology outpatient clinic did not know their individual CV risk levels correctly. Although 37.3% of all participants had a high CV risk, only 20.4% of them defined themselves as at high risk. This may result in them not making enough efforts to change their lifestyle and behavior patterns to improve their health. For this reason, the knowledge level of the patients should be increased. As the lifestyles, medical behaviors and CV risk awareness vary among different segments of the community, all healthcare professionals have a critical duty both in the screening of CV risk factors and in consulting for changing risky behaviors. Health-care providers should advise for lifestyle modification.[18,19] Although it was evidenced that modifying medical behaviors improve health outcomes and reduce health-care costs, lifestyle counseling in physicians' offices is not routinely carried out, physicians give this kind of advice in only 34% of clinical visits.[20,21] Our study results also showed that the primary source of medical information is physician visits. Therefore, during these visits, medical advice about dietary habits, smoking, and physical activity should be improved to achieve a healthy lifestyle and to prevent CVD.

When compared between developed and developing countries, lifestyles, medical behaviors, and CV risk awareness differ among communities and this may also contribute to the national differences in the prevalence of CVD. For example, when looking at food consumption, it is seen that the recommended amount of vegetables (400 g/day) or fruit (300 g/day) is consumed by only 0.4% of countries. Besides, only 20% of countries meet red meat consumption recommendations (<100 g/week).[22] While recommended food intake goals (400 g/day for vegetables, 28.35 g/week for nuts/seeds, 50 g/day for whole grains, 100 g/week for seafood, 100 g/week for red meats) could not be achieved; fruit, nuts, and seed intake increased from 1990 to 2010, consuming whole grains decreased globally and the consumption of red meat also increased.[22] Besides all these, to achieve an improvement in

Table 4: Lifestyle habits of participants

Variable	n (%)
Regular exercise*	
Yes	999 (35.8)
No	1794 (64.2)
Body mass index (kg/m²), mean±SD	2791
	28.42±4.98
Consumption of herbal products	
Yes	397 (14.2)
No	2395 (85.8)
Consumption of vitamins/nutritional supplements	
Yes	477 (17.1)
No	2316 (82.9)
Number of sugar cubes used in tea or coffee	
None	890 (31.9)
1	877 (31.4)
2	753 (27.0)
3	208 (7.4)
>3	65 (2.33)
Using additional table salt for meals	
Yes	1232 (44.1)
No	1561 (55.9)
Type of preferred bread	
White	1703 (61.0)
Bran	389 (13.9)
Rye	130 (4.6)
Corn flour	14 (0.5)
Whole wheat	343 (12.3)
Farmhouse	187 (6.7)
None	27 (1.0)
Frequency of fast food consumption (hamburger, pizza, French fries etc.)	
>1 time a week	204 (7.3)
Once a week	351 (12.6)
Once a month	732 (26.2)
None	1506 (53.9)
Number of meals per a day	
2	673 (24.1)
3	1503 (53.8)
5	617 (22.1)
Skipped meal	
Breakfast	258 (9.2)
Lunch	767 (27.5)
Dinner	148 (5.3)
None	1620 (58.0)

*3 days a week, at least 30 min

Table 5: Medical behaviours and drug usage of patients

Variable	n (%)
Source of medical information	
Consulting a physcian	2141 (76.7)
TV programs	208 (7.4)
Newsletters and magazines	22 (0.8)
Searching the web	180 (6.4)
Not interested	242 (8.7)
Time interval for applying to a healthcare professional (months)	
<3	604 (21.6)
3	856 (30.7)
3–6	1024 (36.7)
>6	308 (11.0)
Number of drugs used in a day	
0	212 (7.6)
1	380 (13.6)
2	387 (13.9)
3	438 (15.7)
4	423 (15.2)
5	323 (11.6)
>5	627 (22.5)
Regular use of drugs	
Yes	2218 (80.0)
No	554 (20.0)
Opinion about statins	
Harmful	1072 (38.4)
Not harmful	1355 (48.5)
No idea	365 (13.1)

public health, it must be kept in mind that it is recommended to focus not only on what should be eaten or not but also on public education, nutrition policies, and research. Countries should create cost-effective public health programs to address modifiable risk factors and minimize CVD-related disability and early death.

Public policies, educational initiatives or clinical interventions aimed at both improving healthy lifestyle awareness and changing medical behaviors should take place among the priority objectives.[23] Unfortunately, the scientific communities give inconsistent messages about nutrition and exercise. While healthcare professionals report that exercise improves CV health, there are also some controversial issues about intense endurance exercise and CV risk.[24] However, over the past 30 years, significant gains have been made in tobacco control worldwide[25] and smoking trends are better than diet and exercise trends.

In addition, another health problem is noncompliance with drug therapy. Despite effective therapies exist, adherence to drug schedules is still inadequate. Misinformation on the internet, television, and newspapers worsen drug compliance. In our study population, even if 80% of participants report that they use their drugs regularly, outpatient pharmacy data shows that only 43% of patients conform to statins, 40% to beta-blockers, and 38.8% to angiotensin-converting enzyme inhibitors or angiotensin receptor blockers.[26] The figures in low-income countries are worse, for example, only < 5% of some Africans use statins given for secondary prevention.[27]

There are some limitations of this study. First, only patients who admitted to outpatient cardiology clinics were included in the study, hence the results may not reflect all segments of the society. Furthermore, we are aware about the fact that Framingham's risk score underestimates the risk status of patients under the age of 30. Yet, to our knowledge, there are no validated risk scores in this age group Hence, all patients

Table 6: Medications of patients	
Drug	***n* (%)**
ACE-i/ARB	
Yes	619 (22.2)
No	2157 (77.2)
Unknown	17 (0.6)
BB	
Yes	1255 (44.9)
No	1518 (543)
Unknown	20 (0.7)
Ivabradin	
Yes	42 (1.5)
No	2730 (97.7)
Unknown	21 (0.7)
CCB	
Yes	468 (16.8)
No	2310 (82.7)
Unknown	15 (0.5)
Diuretics (alone)	
Yes	259 (9.3)
No	2519 (90.2)
Unknown	15 (0.5)
Spironolactone	
Yes	168 (6.0)
No	2610 (93.5)
Unknown	14 (0.5)
Alfa blocker	
Yes	77 (2.8)
No	2699 (96.6)
Unknown	17 (0.6)
Eplerenon	
Yes	11 (0.4)
No	2767 (99.1)
Unknown	15 (0.5)
RAAS blocker + CCB	
Yes	204 (7.03)
No	2574 (92.2)
Unknown	15 (0.5)
RAAS blocker + diuretics	
Yes	571 (20.4)
No	2207 (79.0)
Unknown	15 (0.5)
RAAS blocker + CCB + diuretics	
Yes	30 (1.1)
No	2748 (98.4)
Unknown	15 (0.5)
BB+diuretics	
Yes	29 (1.0)
No	2749 (98.4)
Unknown	15 (0.5)
Long-acting nitrate	
Yes	106 (3.8)
No	2671 (95.6)
Unknown	16 (0.6)
Trimetazidine	
Yes	154 (5.5)

Table 6: Contd...	
Drug	***n* (%)**
No	2624 (93.9)
Unknown	15 (0.5)
Ranolazine	
Yes	82 (2.9)
No	2696 (96.5)
Unknown	15 (0.5)
Statins	
Yes	803 (28.7)
No	1975 (70.7)
Unknown	15 (0.5)
Ezetimibe	
Yes	19 (0.7)
No	2759 (98.8)
Unknown	15 (0.5)
Fenofibrate	
Yes	66 (2.4)
No	2712 (97.1)
Unknown	15 (0.5)
Omega-3fatty acids	
Yes	15 (0.5)
No	2763 (98.9)
Unknown	15 (0.5)
ASA	
Yes	1148 (41.1)
No	1630 (58.4)
Unknown	15 (0.5)
Clopidogrel	
Yes	366 (13.1)
No	2412 (86.4)
Unknown	15 (0.5)
Prasugrel	
Yes	22 (0.8)
No	2755 (98.7)
Unknown	15 (0.5)
Ticagrelor	
Yes	63 (2.3)
No	2715 (97.2)
Unknown	15 (0.5)
Warfarin	
Yes	89 (3.2)
No	2689 (96.3)
Unknown	15 (0.5)
NOAC	
Yes	137 (4.9)
No	2641 (94.6)
Unknown	15 (0.5)
Oral antidiabetics	
Yes	559 (20.0)
No	2219 (79.4)
Unknown	15 (0.5)
Insulin	
Yes	214 (7.7)
No	2561 (91.7)
Unknown	17 (0.6)

Contd...

Table 6: Contd...

Drug	*n* (%)
Amiodarone	
Yes	21 (0.7)
No	2757 (98.7)
Unknown	15 (0.5)
Class-1 antiarrhythmics	
Yes	23 (0.8)
No	2754 (98.6)
Unknown	15 (0.5)
Digoksin	
Yes	65 (2.4)
No	2674 (97.1)
Unknown	15 (0.5)
Antidepressants	
Yes	223 (8.1)
No	2514 (91.3)
Unknown	17 (0.6)
Oral NSAIDs (except ASA)	
Yes	665 (24.1)
No	2072 (75.2)
Unknown	17 (0.6)
PPIs	
Yes	986 (35.8)
No	1752 (63.6)
Unknown	15 (0.5)

Yes: Taking the drug, No: Not taking the drug, ACE-i/ARB: Angiotensin-converting enzyme inhibitors/angiotensin receptor blockers, CCB: Calcium channel blockers, RAAS: Renin-angiotensin aldosterone system, ASA: Acetylsalicylic acid, NOAC: New oral anticoagulants, PPIs: Proton-pump inhibitors, BB: Beta-blocker

were evaluated according to Framingham's score. In addition, in some parts of the country, the fact that people speak different local languages may have affected the comprehensibility and accuracy of the questionnaire. Furthermore, access to medical records of some patients (especially echocardiography reports) was limited.

CONCLUSION

Despite these limitations, this study provides us valuable real-life data in terms of lifestyle habits, awareness of both CV risk factors and individual CV risk levels of patients admitted to cardiology outpatient clinics. The results obtained from this study could inspire researchers for future public health studies in the CV field.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patients have given their consent for clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity.

Conflicts of interest

There are no conflicts of interest.

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