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# The utilization of nonprescription medications in Saudi patients with cardiovascular diseases

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## ABSTRACT

**Background:** Cardiovascular diseases (CVDs) are the most common cause of disease-related death in Saudi Arabia. The incidence of CVDs continues to increase, presenting a major health care problem. Nonprescription medications are widely used by patients with CVD and may cause adverse drug events, either by worsening the disease or by harmfully interacting with prescribed medications. We investigated the patterns of nonprescription medication utilization and the factors associated with their use in patients with CVD.

**Methods:** This was a cross-sectional study conducted at the Cardiology Clinics of an academic tertiary health care center. Participants were asked about their sociodemographic characteristics, medical history and frequency of using nonprescription medications including over-the-counter (OTC) products, dietary supplements, and herbal products. Moreover, we investigated the participants' sources of information about nonprescription medications. Multivariate logistic regression analysis was conducted to examine the predictors of nonprescription medication use.

**Results:** A total of 209 participants were interviewed. The mean age of the participants was  $56 \pm 15$  years, and 110 (52.6%) were female. Of the 209 participants, 116 (55%) reported routine use of nonprescription medications. Black seeds and garlic were the most frequently used herbal products. Acetaminophen, cold/cough remedies, and ibuprofen were the most commonly reported OTC drugs. Of the surveyed patients, 54 (46.5%) used nonprescription medications to manage cardiovascular conditions specifically. Compared with other comorbidities, diabetes mellitus was associated with a higher use of nonprescription medications.

**Conclusion:** In patients with CVD, the routine use of nonprescription medications was common for a number of reasons. Health care providers should proactively discuss nonprescription use with their CVD patients to avoid potential harmful outcomes.

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## 1. Introduction

Cardiovascular diseases (CVDs) are the most common cause of disease-related death in Saudi Arabia, similar to previous findings reported globally (Al-Omran, 2012). Although there are limited data on the incidence and prevalence of CVDs among Saudis, these indicators are expected to increase due to the increase in risk factors such as hypertension, obesity, elevated low-density lipoprotein (LDL)-cholesterol, and physical inactivity, as reported in recent studies (Alenazi et al., 2015; Gao et al., 2013; "Heart Disease Facts & Statistics | cdc.gov," n.d.; Rabito and Kaye, 2013).

The data on conventional medicine have demonstrated that the effective use of therapeutic agents for CVDs leads to better health outcomes (Amsterdam et al., 2014; Fonarow et al., 2011; Yancy

**Abbreviations:** CVD, cardiovascular disease; OTC drugs, over-the-counter drugs; CAM, complementary and alternative medicine; NSAID, nonsteroidal anti-inflammatory drug.

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et al., 2013). The recent American College of Cardiology/American Heart Association guidelines recommend medications such as beta-blockers, angiotensin-converting enzyme (ACE) inhibitors, aspirin, and high-intensity statins to prolong survival and reduce the risk of cardiovascular complications, including stroke, heart failure, and myocardial infarction (Amsterdam et al., 2014). Similarly, in patients with heart failure, guideline-directed medical therapy improves quality of life, reduces future re-hospitalizations and reduces the risk of mortality (Fonarow et al., 2011; Yancy et al., 2013).

Recent reports have suggested that the regular use of nonprescription medications to treat chronic conditions such as CVDs is common. However, this use has been associated with adverse drug events and poor adherence to prescribed medications (Bahall, 2015; Grant et al., 2012; Mattila et al., 2013; Rottlaender et al., 2007). For example, the concomitant administration of ginkgo (*Ginkgo biloba*) or garlic (*Allium sativum*) with warfarin or aspirin may enhance the risk of bleeding, representing an interaction with potentially serious outcomes (Bahall and Edwards, 2015; Wang, 2015). Many factors have been linked to nonprescription medications utilization in CVDs patients, including patients' stress and psychological state, the accessibility and affordability of nonprescription medications, and the widespread advertising of nonprescription medications as harmless therapy for controlling a number of CVDs symptoms (Grant et al., 2012; Prasad et al., 2013; Rabito and Kaye, 2013). Although data have suggested that the Saudi population has a higher utilization of nonprescription medications than those in different studies worldwide, there are no data on the use of nonprescription medications in Saudi patients with CVDs (Elolemy and Albedah, 2012). Therefore, our study investigated the utilization patterns of nonprescription medications in this important patient population.

## 2. Methods

### 2.1. Study design

A cross-sectional study was conducted in adult cardiology clinics at King Saud University Medical City, which is a tertiary hospital in Riyadh with a 900-bed capacity.

### 2.2. Study population

Subjects were adults aged 18 years or older with a documented diagnosis of a CVD, including at least one of the following: heart failure with reduced or preserved ejection fraction, chronic stable angina, acute coronary syndrome, arrhythmias, or hypertension. Subjects were required to be scheduled for regular visits and able to respond to the interview questions. Subjects were excluded if they were unable to answer the interview questions for any reason.

### 2.3. Data collection and study plan

After the study had been approved by the King Saud University Medical City Institution Review Board Committee, a pilot study was conducted with the target population to validate the survey. Patients diagnosed with a CVD at the cardiology clinic of this tertiary academic hospital who met the inclusion criteria were randomly asked to participate in the study and answer all the survey's questions. Participants were surveyed prior to their clinic appointment. The survey asked participants about their socio-demographic data (age, sex, marital status, education level, and income), comorbidities, and frequency of nonprescription medication use (including OTC products, dietary supplements, and herbal supplements). The definition of nonprescription medications in the

current study was (derived from extracted based on in accordance with) a recent published study which conducted at the University of Wisconsin in the United States of America (Mattila et al., 2013). OTC medications, was defined as drugs or natural products that can be accessed by the patients directly regardless of physician prescription, thus patients are the principal contributors in the management of their own health status (Cooper, 2013). Economic level was categorized according to the annual income by Saudi riyal into; (low: <40,000, middle: 40,000–80,000, high: >80,000). Participants were also asked about their reasons for using nonprescription medications, their most common source of information about the safety and efficacy of nonprescription medications, and whether they had discussed nonprescription medications with their health care providers.

### 2.4. Statistical analysis

Descriptive statistics were used to report the prevalence of nonprescription medication use. Percentages and frequencies were used to summarize the categorical variables, while means and standard deviations were calculated for continuous variables. Chi-square or Fisher's exact test as required and two-sample t-tests were used to summarize the relationships between demographic variables and the use of nonprescription medications for categorical and continuous data, respectively. A logistic regression model was used to assess the changes in risk of nonprescription medication use based on participants' sociodemographic characteristics and comorbidities. A value of  $p < 0.05$  was considered statistically significant. Data were entered and analyzed using IBM SPSS for Windows, version 22 (IBM Corp., Armonk, NY, USA).

## 3. Results

In total, 209 participants were interviewed; 99 (47.4%) were male and 110 (52.6%) were female. The mean age of the participants was 56.5 years (SD = 15.5). More than half of the participants had dyslipidemia, and two-thirds had hypertension. Nonprescription medication users differed significantly from non-users in osteoarthritis only ( $p = 0.025$ ). Table 1 shows the clinical and demographic characteristics of the participants.

More than half of the study participants reported regularly using at least one nonprescription medication in the last three months. Black seeds (*Nigella sativa*) were the most commonly used herbal therapy (33%), followed by garlic (*Allium sativum*) (21.5%). Cold and cough remedies (including antihistamines, decongestants, and cough medicines) were reported by 23.4%, and ibuprofen by 14.3% were the most commonly utilized OTC medications. Table 2 provides detailed information on the types of nonprescription medications used.

Of the 209 patients surveyed, a large percentage used acetaminophen regularly or irregularly (62.2%) as an OTC medication; however, acetaminophen was not included in the analysis. After the multivariate logistic regression, participants with diabetes were found to be more likely to use nonprescription medications (OR 2.18, 95%CI 1.106–4.307). Other demographic characteristics and comorbidities did not predict nonprescription medication use, as shown in Table 3.

Of the 116 participants who reported routine use of nonprescription medications, 54 (46.5%) indicated that they had used nonprescription medications specifically to manage a cardiovascular condition. In this study, routine use means on a regular basis such as daily or weekly which was explained to the participants. Regarding physician-patient relationships, 31.6% of the patients visited more than one physician during the same period. Moreover, only 22.5% had discussed their use of nonprescription medications

**Table 1**  
Baseline characteristics of the study population.

Characteristic	Total population n = 209 (%)	Nonprescription medication use		P Value
		Users n = 116 (%)	Non-users n = 93 (%)	
Age, years (Mean ± SD)	56.5 ± 15.5	55.8 ± 15.3	57.9 ± 15.3	0.599
Sex				0.587
Male	99 (47.3)	53 (25.3)	46 (22)	
Female	110 (52.6)	63 (30.1)	47 (22.4)	
Marital status				0.858
Married	163 (78)	91 (43.5)	72 (34.4)	
Unmarried	46 (22)	25 (11.9)	21 (10)	
Education level				0.783
No education	60 (28.7)	33 (15.7)	27 (12.9)	
Elementary school	38 (18.2)	18 (8.6)	20 (9.5)	
Middle school	24 (11.5)	13 (6.2)	11 (5.2)	
High school	31 (14.8)	18 (8.6)	13 (6.2)	
Higher education	56 (26.8)	34 (16.2)	22 (10.5)	
Income				0.521
Low income; <40,000	101 (48.3)	52 (24.8)	49 (23.4)	
Medium income; 40,000–80,000	31 (14.8)	18 (8.6)	13 (6.2)	
High income; >80,000	77 (36.8)	46 (22)	31 (14.8)	
Comorbidities				
Dyslipidemia	149 (71.3)	85 (40.6)	64 (30.6)	0.479
Hypertension	140 (67.0)	78 (37.3)	62 (29.6)	0.930
Rheumatic heart disease	6 (2.9)	4 (1.9)	2 (0.9)	0.695
Heart failure	58 (27.8)	33 (15.7)	25 (11.9)	0.802
Ischemic heart disease	30 (14.4)	18 (8.6)	12 (5.7)	0.592
Arrhythmia	57 (27.3)	29 (13.8)	28 (13.3)	0.410
Thromboembolic disorders	76 (36.4)	43 (20.5)	33 (15.7)	0.813
Valvular heart disease	39 (18.7)	22 (10.5)	17 (8.1)	0.899
Diabetes mellitus	104 (49.8)	51 (24.4)	53 (25.3)	0.061
Renal insufficiency	37 (17.7)	22 (10.5)	15 (7.1)	0.593
Osteoarthritis*	108 (51.7)	68 (32.5)	40 (19.1)	0.025
Asthma/COPD	18 (8.6)	12 (5.7)	6 (2.8)	0.319
Other	23 (11)	17 (8.1)	6 (2.8)	0.060
Family history of DM/HTN	162 (77.5)	89 (42.5)	73 (34.9)	0.761

COPD, chronic obstructive pulmonary disease; HTN, hypertension.

**Table 2**  
Frequency of using nonprescription medications.

Most frequently used nonprescription medications	Nonprescription medication users = 116 n (%)
Herbal medicines	
Black seeds ( <i>Nigella sativa</i> )	69 (33)
Garlic ( <i>Allium sativum</i> )	45 (21.5)
Rosemary ( <i>Rosmarinus officinalis</i> )	1 (0.5)
Ginkgo ( <i>Ginkgo biloba</i> )	1 (0.5)
OTC products	
Cold/cough remedies	49 (23.4)
Ibuprofen	30 (14.3)
Diclofenac	22 (10.5)
Dietary supplements	24 (11.5)
PPI/antacids	14 (6.6)

OTC, over-the-counter; PPI, proton pump inhibitor.

with their health care providers during follow-up visits. Very few patients, 2.4% of the sample, reported that their physicians recommended using nonprescription medications.

The majority of the study participants assumed that nonprescription medications were harmless, and many believed that they improved general health and were widely available (61.7%, 58.2%, and 41.1%, respectively). **Table 4** provides the most common reasons that study participants used nonprescription medications. Advice from friends and family was the most common primary source of information about nonprescription medications, reported by more than half of nonprescription medication users (57.7%), followed by media and advertising (44.5%), and the patients themselves (36.5%). **Table 5** presents the study participants' primary sources of information about nonprescription medications. How-

**Table 3**  
Predictors of nonprescription medication use.

Variable	OR	95%CI
Age (years)	1.01	0.98–1.04
Income		
Low income	Reference	
High income	1.06	0.42–2.63
Level of education		
No education	Reference	
Elementary school	0.71	0.27–1.88
Middle school	0.76	0.27–2.11
High school	0.72	0.27–1.90
Comorbidities		
Heart failure	0.79	0.40–1.54
Ischemic heart disease	0.82	0.35–1.93
Hypertension	0.94	0.47–1.90
Dyslipidemia	0.6	0.26–1.31
Diabetes mellitus	2.2	1.11–4.30

**Table 4**  
Reasons for using nonprescription medications.

Reason	Patients completed the survey = 175 n (%)
Harmless	108 (61.7)
Improve general health	102 (58.2)
Widely available and easy to use	72 (41.1)
Side effects of prescribed medications	50 (28.5)
More beneficial than prescribed medications	39 (22.2)
Other reasons	10 (5.7)

**Table 5**  
Source of information about nonprescription medications.

Source	Patients completed the survey = 175 n (%)
Family and friends	101 (57.7)
Media and advertising	78 (44.5)
Patients themselves	64 (36.5)
Other patient	49 (28)
Healthcare provider	43 (24.5)
CAM practitioner	38 (21.7)

CAM, complementary and alternative medicine.

ever, because these were the last questions in the survey, 34 participants didn't answer them.

#### 4. Discussion

Our study identified a high frequency of nonprescription medication utilization in patients with CVDs. Compared with previous reports from North America, this study showed a similar frequency but with different patterns (Mattila et al., 2013; Prasad et al., 2013). In a systematic review of complementary and alternative medicine (CAM), the frequency of herbal supplement use ranged between 2% and 46%; the prevalence in our study was 43%, which falls within this range (Grant et al., 2012). Our study showed that black seeds (*Nigella sativa*) were the most utilized herbal medicine (33%). This finding differed from previous reports and is unique to our patient population (Amira and Okubadejo, 2007; Bahall, 2015; Mattila et al., 2013; Prasad et al., 2013). The high use of black seeds could be explained by religious factors and the use of prophetic medicine (Al-Tibb-e-Nabawi) (Ahmad et al., 2013; Elolemy and Albedah, 2012). This type of nonconventional medicine is derived from the holy Qura'an and the prophet Mohammed guide (Hadith) to treat or diagnose different diseases (Ahmad et al., 2013; AlRawi et al., 2017; Saniotis, 2012). Furthermore, this study showed that despite its potential drug-herb interactions, garlic (*Allium sativum*) was used as a supplement by 21.5% of Saudi patients, and this prevalence was higher than the 11.7% reported among patients at Mayo Clinic in Minnesota (Prasad et al., 2013). However, a similar prevalence was reported in a Nigerian study with a hypertensive population, in which 21% used garlic (Amira and Okubadejo, 2007).

A recent study of 161 heart failure patients reported that 50% of the patients used acetaminophen for pain relief, compared to the 62.2% in our population. This difference might be explained by the different cardiac-related problems in our study population. However, in the same study, cold/cough remedies were also one of the most frequently reported OTC medications, used by 17.3% of the patients; this is in accordance with the findings of the present study, although cold/cough remedies were more frequently used, at 23.4% (Mattila et al., 2013). Additional studies are needed to investigate the use of cold/cough remedies in patients with other CVDs. A cross-sectional study in the US reported that 75.4% of the participants used dietary supplements, differing from our findings (11.5%) in this CVDs population (Prasad et al., 2013).

Many questions have emerged regarding the safety of OTC medications in CVDs patients, especially nonsteroidal anti-inflammatory drugs (NSAIDs). A recent national cohort study in Taiwan showed that the use of NSAIDs in hypertensive patients increased the risk of chronic kidney disease. Furthermore, this risk was higher for patients with diabetes mellitus, myocardial infarction, or with aspirin and statin use in the last year (Hsu et al., 2015). These factors are important to consider, as the prevalence of hypertension was very high in the current study (67%).

For patients with heart failure, the regular use of NSAIDs is harmful and associated with deterioration in patient status (Yancy et al., 2013). Moreover, patients who concurrently use war-

farin and NSAIDs are at an increased risk of bleeding (Holbrook et al., 2012).

Nearly half of nonprescription medication users reported that they used these medications to manage their CVDs; this finding is consistent with other reports that indicated that up to 44.2% of patients used complementary therapies for CVDs symptoms (Prasad et al., 2013).

Moreover, the small proportion of CVDs patients who discussed nonprescription therapies with their physician (22.5%) appeared to reflect an underreporting and lack of awareness of health care providers regarding their patients' use of CAM (Grant et al., 2012).

To understand the perceptions and characteristics motivating cardiac patients to use nonprescription therapies, two questions in the survey asked patients about their reasons for using nonprescription medications and their sources of information. Despite the evidence indicating the occurrence of adverse events due to drug-drug interactions and herb-drug interactions, patient perceptions about the safe use of nonprescription medications remain influential (Grant et al., 2012). More than half of this study population (61.7%) believed that nonprescription medications were harmless. These results support a previous study on coronary artery disease in which patients stated that their primary reason for using CAM was that it had fewer side effects than prescribed medications (Chu et al., 2013). Other important findings of our study pertain to users' sources of information about nonprescription medications. Of the 175 participants who completed this question, 57.7% received information about nonprescription medications from family and friends and 44.5% from media and advertising. In contrast, a lower proportion of participants (24.5%) consulted a health care provider including a pharmacist, physician, or nurse about their nonprescription use. Similar data have been reported by Mandreker Bahall, who found that family (52.4%) and friends (46.5%) were the main sources of information, whereas the least common source of information was clinic staff (2.2%) (Bahall, 2015).

We recognize that our study has several limitations, including the fact that it may have been difficult for patients to recall the nonprescribed medications used in the last three months. Patients were surveyed at a single hospital, which might not be representative of the overall population of cardiac patients in Saudi Arabia. This limitation may be minimal, as a recent study on traditional medicine use among neurological patients at the same hospital reported that a considerable proportion of the surveyed patients lived outside Riyadh city (Mohammad et al., 2015). Therefore, the present findings may be generalized to the Saudi population. Despite these limitations, notable strengths of this study include the involvement of different CVDs, the random selection of participants to minimize bias, and the relatively homogenous distribution of male and female participants.

#### 5. Conclusion

This is the first study to assess the use of nonprescription medications in patients with CVDs in Saudi Arabia. Our study indicated that nonprescription medication use was common among adults with CVDs, and the factors and patient behaviors associated with this use were identified. We recommend that clinicians consider the results of this study and spend more time discussing nonprescription medication use to ensure patient safety and medication effectiveness, as these changes should have a positive influence on clinical practice and economic burden.

Further research is needed to determine the health-related costs of personal use of nonprescription medications and costs spent to manage the adverse events resulting from this use.

## 6. Declarations

### Ethics approval and consent to participate

All participants provided written informed consent. The study was approved by the King Saud University Medical City Institution Review Board Committee, reference number: 16/0105/IRB.

### Availability of data and material

All data generated and analyzed during the current study are available and included in this published article.

### Competing interests

The authors declare that they have no competing interests.

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### Authors' contributions

ES conducted the study and collected the data. KA designed and coordinated the study and performed the data analysis. Both authors participated in the interpretation of the results and the drafting and approval of the final manuscript.

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## References

- Ahmad, A., Husain, A., Mujeeb, M., Khan, S.A., Najmi, A.K., Siddique, N.A., Damanhour, Z.A., Anwar, F., 2013. A review on therapeutic potential of *Nigella sativa*: a miracle herb. *Asian Pac. J. Trop. Biomed.* 3, 337–352. [https://doi.org/10.1016/S2221-1691\(13\)60075-1](https://doi.org/10.1016/S2221-1691(13)60075-1).
- Al-Omran, M., 2012. Atherosclerotic disease and risk factor modification in Saudi Arabia: a call to action. *Vasc. Health Risk Manag.* 8, 349–355. <https://doi.org/10.2147/VHRM.S32783>.
- Alenazi, S.A., Koura, H.M., Zaki, S.M., Mohamed, A.H., 2015. Prevalence of obesity among male adolescents in arar Saudi Arabia: future risk of cardiovascular disease. *Indian J. Commun. Med.* 40, 182–187. <https://doi.org/10.4103/0970-0218.158864>.
- AlRawi, S.N., Khidir, A., Elnashar, M.S., Abdelrahim, H.A., Killawi, A.K., Hammoud, M. M., Fetters, M.D., 2017. Traditional Arabic & Islamic medicine: validation and empirical assessment of a conceptual model in Qatar. *BMC Complement. Altern. Med.* 17, 157. <https://doi.org/10.1186/s12906-017-1639-x>.
- Amira, O.C., Okubadejo, N.U., 2007. Frequency of complementary and alternative medicine utilization in hypertensive patients attending an urban tertiary care centre in Nigeria. *BMC Complement. Altern. Med.* 7, 30. <https://doi.org/10.1186/1472-6882-7-30>.
- Amsterdam, E.A., Wenger, N.K., Brindis, R.G., Casey, D.E., Ganiats, T.G., Holmes, D.R., Jaffe, A.S., Jneid, H., Kelly, R.F., Kontos, M.C., Levine, G.N., Liebson, P.R., Mukherjee, D., Peterson, E.D., Sabatine, M.S., Smalling, R.W., Zieman, S.J., Anderson, J.L., Halperin, J.L., Albert, N.M., Bozkurt, B., Curtis, L.H., DeMets, D., Fleisher, L.A., Gidding, S., Guyton, R.A., Hochman, J.S., Kovacs, R.J., Ohman, E.M., Pressler, S.J., Sellke, F.W., Shen, W.K., Stevenson, W.G., Wijeyesundera, D.N., Yancy, C.W., 2014. 2014 AHA/ACC guideline for the management of patients with non-ST-elevation acute coronary syndromes: a report of the American

- college of cardiology/American heart association task force on practice guidelines. *Circulation*. <https://doi.org/10.1161/CIR.000000000000134>.
- Bahall, M., 2015. Complementary and alternative medicine usage among cardiac patients: a descriptive study. *BMC Complement. Altern. Med.* 15, 100. <https://doi.org/10.1186/s12906-015-0610-y>.
- Bahall, M., Edwards, M., 2015. Perceptions of complementary and alternative medicine among cardiac patients in South Trinidad: a qualitative study. *BMC Complement. Altern. Med.* 15, 99. <https://doi.org/10.1186/s12906-015-0577-8>.
- Chu, F.-Y., Yan, X., Zhang, Z., Xiong, X.-J., Wang, J., Liu, H.-X., 2013. Features of complementary and alternative medicine use by patients with coronary artery disease in Beijing: a cross-sectional study. *BMC Complement. Altern. Med.* 13, 287. <https://doi.org/10.1186/1472-6882-13-287>.
- Cooper, R.J., 2013. Over-the-counter medicine abuse – a review of the literature. *J. Subst. Use* 18, 82–107. <https://doi.org/10.3109/14659891.2011.615002>.
- Elolemy, A.T., Albedah, A.M.N., 2012. Public knowledge, attitude and practice of complementary and alternative medicine in Riyadh region, Saudi Arabia. *Oman Med. J.* 27, 20–26. <https://doi.org/10.5001/omj.2012.04>.
- Fonarow, G.C., Yancy, C.W., Hernandez, A.F., Peterson, E.D., Spertus, J.A., Heidenreich, P.A., 2011. Potential impact of optimal implementation of evidence-based heart failure therapies on mortality. *Am. Heart J.* 161 (1024–1030), e3. <https://doi.org/10.1016/j.ahj.2011.01.027>.
- Gao, Z.-Y., Qiu, Y., Jiao, Y., Shang, Q.-H., Xu, H., Shi, D.-Z., 2013. Analysis on outcome of 3537 patients with coronary artery disease: integrative medicine for cardiovascular events. *Evid. Based. Complement. Alternat. Med.* 2013, 162501. <https://doi.org/10.1155/2013/162501>.
- Grant, S.J., Bin, Y.S., Kiat, H., Chang, D.H.-T., 2012. The use of complementary and alternative medicine by people with cardiovascular disease: a systematic review. *BMC Pub. Health* 12, 299. <https://doi.org/10.1186/1471-2458-12-299>.
- Heart Disease Facts & Statistics | cdc.gov [WWW Document], n.d. URL <<http://www.cdc.gov/heartdisease/facts.htm>> (accessed 10.7.16).
- Holbrook, A., Schulman, S., Witt, D.M., Vandvik, P.O., Fish, J., Kovacs, M.J., Svensson, P.J., Veenstra, D.L., Crowther, M., Guyatt, G.H., 2012. Evidence-based management of anticoagulant therapy. Antithrombotic therapy and prevention of thrombosis, 9th ed.: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. *Chest* 141. doi: 10.1378/chest.11-2295.
- Hsu, C.C., Wang, H., Hsu, Y.H., Chuang, S.Y., Huang, Y.W., Chang, Y.K., Liu, J.S., Hsiung, C.A., Tsai, H.J., 2015. Use of nonsteroidal anti-inflammatory drugs and risk of chronic kidney disease in subjects with hypertension: nationwide longitudinal cohort study. *Hypertension* 66, 524–533. <https://doi.org/10.1161/hypertensionaha.114.05105>.
- Mattila, M., Boehm, L., Burke, S., Kashyap, A., Holschbach, L., Miller, T., Vardeny, O., 2013. Nonprescription medication use in patients with heart failure: assessment methods, utilization patterns, and discrepancies with medical records. *J. Card. Fail.* 19, 811–815. <https://doi.org/10.1016/j.cardfail.2013.10.009>.
- Mohammad, Y., Al-Ahmari, A., Al-Dashash, F., Al-Hussain, F., Al-Masnoun, F., Masoud, A., Jradi, H., Mohammad, Y., Al-Ahmari, A., Al-Dashash, F., Al-Hussain, F., Al-Masnoun, F., Masoud, A., Jradi, H., 2015. Pattern of traditional medicine use by adult Saudi patients with neurological disorders. *BMC Complement. Altern. Med.* 15, 102. <https://doi.org/10.1186/s12906-015-0623-6>.
- Prasad, K., Sharma, V., Lackore, K., Jenkins, S.M., Prasad, A., Sood, A., 2013. Use of complementary therapies in cardiovascular disease. *Am. J. Cardiol.* 111, 339–345. <https://doi.org/10.1016/j.amjcard.2012.10.010>.
- Complementary and Alternative Medicine and Cardiovascular Disease: An Evidence-Based Review, 2013
- Rottlaender, D., Scherner, M., Schneider, T., Erdmann, E., 2007. Multimedikation, compliance und zusatzmedikation bei patienten mit kardiovaskulären erkrankungen. *Dtsch. Medizinische Wochenschrift* 132, 139–144. <https://doi.org/10.1055/s-2007-959300>.
- Saniotis, A., 2012. Islamic medicine and evolutionary medicine: a comparative analysis. *J. Islam. Med. Assoc. North Am.* 44, 1–9. <https://doi.org/10.5915/44-1-8780>.
- Wang, X. Long, 2015. Potential herb-drug interaction in the prevention of cardiovascular diseases during integrated traditional and western medicine treatment. *Chin. J. Integr. Med.* 21, 3–9. <https://doi.org/10.1007/s11655-014-1892-5>.
- Yancy, C.W., Jessup, M., Bozkurt, B., Butler, J., Casey, D.E., Drazner, M.H., Fonarow, G. C., Geraci, S.A., Horwich, T., Januzzi, J.L., Johnson, M.R., Kasper, E.K., Levy, W.C., Masoudi, F.A., McBride, P.E., McMurray, J.J.V., Mitchell, J.E., Peterson, P.N., Riegel, B., Sam, F., Stevenson, L.W., Tang, W.H.W., Tsai, E.J., Wilkoff, B.L., 2013. 2013 ACCF/AHA guideline for the management of heart failure: a report of the american college of cardiology foundation/american heart association task force on practice guidelines. *Circulation* 128. <https://doi.org/10.1161/CIR.0b013e31829e8776>.