



## Knowledge, Attitude and Barriers using Atherosclerotic Cardiovascular Disease (ASCVD) Risk Assessment Calculator in Management of Dyslipidemia among Primary Health Care Providers

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### ABSTRACT

**Objectives:** Cardiovascular disease (CVD) remains the leading cause of morbidity and mortality. The American College of Cardiology/American Heart Association (ACC/AHA) atherosclerotic cardiovascular disease (ASCVD) risk estimator is a recently developed online calculator tool for primary prevention. Family physicians, as first-line soldiers, have close contact with local community patients making preventive care management an integral part of their routine work. Therefore, we would like to assess primary health care providers' knowledge, attitude and barriers for using ASCVD risk estimator in a family health care facility. **Methods:** This was a quantitative, cross-sectional, single-center study which took place at a tertiary health care facility between December 2018 and January 2019. An English-paper-based self-administered questionnaire was distributed to all primary health care physicians (n=172). **Results:** Most of the participants were using a different type of cardiovascular risk score calculator 128 (97.7%). Among these scores, ASCVD risk assessment calculator was the highest frequently used calculator 67 (51.1%) and Framingham risk score 43 (32.8%). Study participant preferred to use mobile application 102 (77.9%) as a technical method of risk score calculation. ASCVD knowledge was significantly related to participants' clinical attitude ( $r=0.3$ ,  $p\text{-value}=0.003$ ) however, they have moderate knowledge about ASCVD risk calculator (61.7%), and only 37.3% have a positive attitude towards it. **Conclusion:** Health promotion implementation needs using powerful primary prevention of cardiovascular risk calculators. Therefore, enhancing family physician knowledge and eliminate obstacles will gradually improve their attitude towards disease prediction and prevention.

**Keywords:** Atherosclerosis cardiovascular disease (ASCVD), Primary prevention, Family physician, Dyslipidemia

**Abbreviations:** CVD: Cardiovascular Disease; ACC/AHA: The American College of Cardiology/American Heart Association; ASCVD: Atherosclerotic Cardiovascular Disease

### INTRODUCTION

Despite significant improvement in health care provided, cardiovascular disease (CVD), which may be present as coronary heart disease, stroke, or peripheral arterial disease, remains the leading cause of morbidity and mortality [1]. World Health Organization reports show that CVD is the leading cause of death globally with more than 31% CVD death-related causes in 2016. Among those, 85% were due to heart attack and stroke [2]. The prevalence of CVD and diabetes were estimated in the US population, approximately 15% of the adult population has either CVD or diabetes and around 7% have either recent acute coronary syndrome or stable coronary heart disease [3].

CVD risk prediction scores, as a tool for prevention, had significant developments in recent few years. Scientists and clinicians are aiming with such tool assessment to identify the potential therapeutic targets to promote the

implementation of cost-effective diagnostic and prognostic strategies in both primary and secondary prevention of cardiovascular disease. Worldwide, almost 80% of cardiovascular diseases incidence could be prevented with modification of lifestyle (smoking and obesity) and tightly control of other known cardiovascular risk factors such as hypertension, diabetes, and dyslipidemia [4]. In a local study, nearly half of the cohort had more than 3 cardiovascular risk factors from which, dyslipidemia was the most prevalent risk factor [5]. The American College of Cardiology/American Heart Association (ACC/AHA) Atherosclerotic cardiovascular disease (ASCVD) risk estimator is a recently developed online calculator tool for primary prevention. It can help providers in assessing the 10-years and lifetime risks for ASCVD [6].

Family physicians are the first-line soldiers that have close contact with local community patients make preventive care management an integral part of their routine work [7]. Their interactions with known CVD risk factors have a great impact on the overall prevalence and incidence of CVD with moderate reductions in several risk factors [8]. Therefore, awareness is of high importance for family physicians with CVD risk assessment tools. Family physicians' knowledge, attitude and barriers of the ASCVD risk estimator have not been thoroughly examined in developing countries. Thus, in this study we would like to assess primary health care providers' knowledge, Attitude and barriers to use ASCVD risk estimator in a family health care facility in Saudi Arabia.

## MATERIALS AND METHODS

### Study Design and Population

This was a quantitative, cross-sectional, single-center study which took place at a tertiary health care facility. An English-based questionnaire was distributed to all physicians (consultant, senior staff, junior staff, and residents) in three primary health care centers following the institution. All primary health care physicians (n=172) during the study period were invited to complete the questionnaire without any exclusion criteria. Consent was agreed with the return of the completed questionnaire.

### Data Collection Technique

Data was obtained between December 2018 and January 2019 using paper-based self-administered questionnaire developed after extensive revision for the literature and in collaboration with the study co-investigators. This self-reported questionnaire facilitated the collection of comprehensive data in a short period of time. The questionnaire was constructed in an English language and consisted of 30 multiple-choice questions. These questions were passed through several revisions to check the consistency, accuracy and to estimate average answering time. The questionnaire was answered anonymously and in private. The study was conducted after obtained ethical approval of our local authority.

### Study Questions and Variables

The study questionnaire included the following domains: demographic data, cardiovascular risk scores awareness, recent clinical practice, physician knowledge about ASCVD score, assessing individual attitudes, and possible barriers (Table 1).

**Table 1 Summary of study questionnaire information**

Variables	
Demographic data	Age
	Gender
	Physician position
	Physician's years of experience
	Health care center physician works on
Cardiovascular risk score awareness	Utilization of cardiovascular risk scores
	Which score used frequently
	The technology used for calculation
Recent clinical practice (ASCVD) risk score	Familiarization with the score
	Getting training about the score

Physician knowledge about ASCVD score	The guideline recommends using the ASCVD risk score
	Timing to use
	Duration of risk estimation
	Clinical implementation score with real-life case scenarios
Assessment of physician attitude towards ASCVD: (Range from strongly agree to strongly disagree)	Easy to use
	Significantly important
	Helpful
	Easy to access
	Decision making
	Local hospital system support
Possible barriers	Lack of knowledge
	Lack of training
	Daily workload
	Time-consuming
	Availability
	Difficulties (use, access, interpretation)

### Statistical Analysis

Data were collected in categorical values. Initially, they were presented in frequencies and percentages then a group comparison was made using Pearson's Chi-square test. Two main scores were generated from the answered questions; knowledge score and attitude score.

The knowledge score was calculated based on correct answers of knowledge questions given; one point for right answers and no points gained for wrong ones for each participant. These questions (11 questions) were marked according to the American college of cardiology/American heart association (ACC/AHA) 2013 guidelines recommendations. Then, participants were labeled as excellent, moderate and low ASCVD knowledge. The attitude score was generated from answers with a positive attitude (one point) and a negative attitude (zero points) for each participant. Attitude score was computed on the basis of 7 questionnaire items.

Study results were considered to be significant if the p-value was  $\leq 0.05$ . IBM Statistics SPSS version 22 software was used to run this analysis (SPSS Inc., Chicago, IL, USA).

## RESULTS

### Study Population

The study questionnaire was sent to a total of 172 primary health care physicians (the response rate was 76.2%). The predominant gender was female 78 (59.5%) and most of the study participants were younger than 40 years 69 (55.2%). Medical degree of the majority of the responders were resident medical doctors 50 (38.2%) and their distribution across different levels was; level 1 (R1) 12 (24.5%), level 2 (R2) 14 (28.6%), level 3 (R3) 11 (22.4%), level 4 (R4) 12 (24.5%).

Most of the participants were using a different type of cardiovascular risk score calculator 128 (97.7%). Among these scores, ASCVD 67 (51.1%) and Framingham risk score 43 (32.8%) were used more often. These risk scores were presented in different platforms of interest for the participants (mobile application, personal computer, hospital electronic medical system, and paper forms) and the study participant preferred to use mobile application 102 (77.9%) as a technical method of risk score calculation.

### Knowledge about ASCVD Risk Score

Several questions were stated to test the general knowledge about the utility of ASCVD risk score calculator. Each correct answer was recorded as one point and the overall points were recalculated for all study participants. Furthermore, knowledge level was determined based on the score gained; low knowledge 15 (13.0%), moderate knowledge 71 (61.7%) and excellent knowledge 29 (25.2%). There was no statistical difference of levels of knowledge between study age groups, different gender, medical positions and years of experience.

### Attitude toward ASCVD Risk Score

Another set of questions, 6 questions, were designed to assess participant behavior towards using ASCVD cardiovascular risk score. These answers were regrouped into; negative attitude 14 (11.1%), neutral attitude 65 (51.6%) and positive attitude 47 (37.3%). Among the study population, the years of experience, gender, age groups, and medical positions didn't affect the attitude towards ASCVD risk score significantly. However, ASCVD knowledge was significantly related ( $r=0.3$ ,  $p=0.003$ ) with participants' clinical attitude (Figure 1).

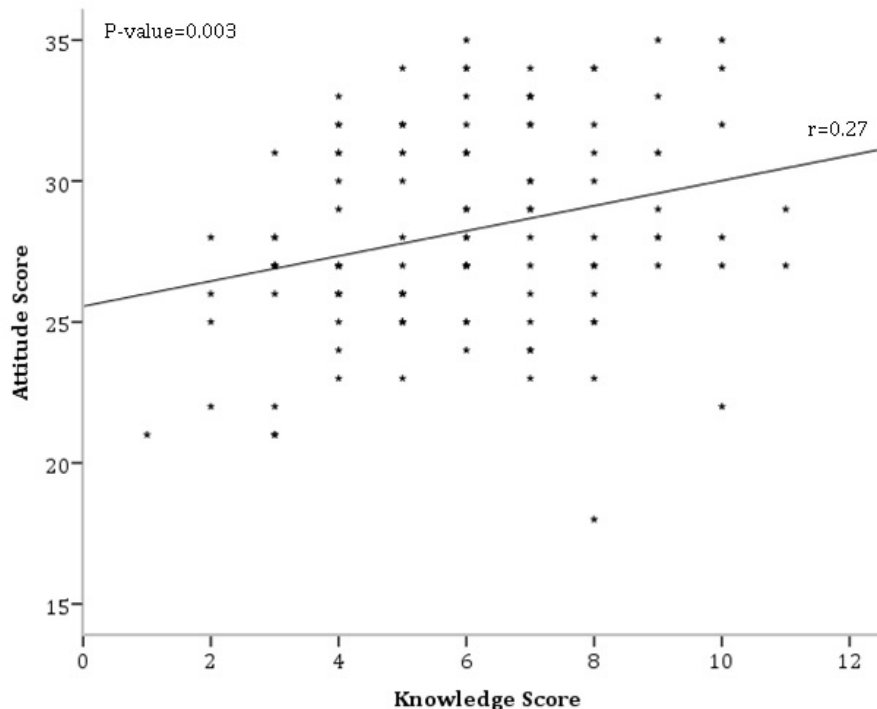


Figure 1 Relationship between physicians general knowledge about ASCVD and their clinical attitude

### Obstacles and Difficulties

The study questionnaire highlighted some points that might reflect the limited utility of the ASCVD cardiovascular risk score; lack of knowledge about such cardiovascular risk score (47.3%), lack of training provided (52.7%), using of score will increase workload (74.0%), it is time consuming (43.5%), calculator was not provided in the e-medical system (58.0%), difficult to use the score (13.7%) and difficulty in the interpretation of the score results (10.7%).

### DISCUSSION

Our study was set out to explore family physicians' knowledge and attitude towards CVD risk assessment calculator, and to identify the barriers associated using this calculator in primary prevention management. ASCVD risk assessment calculator was the highest frequent used calculator; however, the majority of the participants have a moderate knowledge about it, and only one-third had a positive attitude towards the score. Although increasing knowledge level was associated with improvement of physician attitude, increasing the workload, unavailability on the electronic medical system and lack of training were barriers against ASCVD risk calculator use.

Low-cost strategies that effectively communicate CVD risk is of a high priority especially in low and middle-income countries [9]. The 2013 ACC/AHA guidelines focus on ASCVD risk reduction, using a pooled cohort equation to calculate patient's 10-year risk score, and lifetime risk for primary ASCVD, which is used for the management of high-risk patients and to guide initiation of statin therapy [10-12]. Although equation does not include "novel" risk markers and elderly patient were underrepresented, its advances provided are worthy of mention; it provides a specific weight to males and females with different risk factors prevalence and different underlying ASCVD event rates. This equation is recommended for decision making between clinician and patient for prevention with statin medications in particular [13-15].

The average ASCVD risk calculation completion rate was 14.2% from internal medicine clinic reports which reflected a gap in the implementation of AHA/ACC blood cholesterol guidelines [16]. This percentage is far lower compared to what we found in our results where more than half of the family physicians were using the ASCVD risk calculator. Additionally, participants of the current study showed a high knowledge level about ASCVD risk score calculation compared to Bakhai study [16]. In a recently published study, 57% of the participated primary care physicians indicated that they were aware of the ASCVD risk estimator which is considered higher compared to ours [17]. They found that the ASCVD risk score was mainly used to treat the indigent population. That can be explained by the significant burden of illness in low socio-economic class and the complexity of their diseases which makes physician look for better management ways [18,19]. Our research does not highlight such point which can be thoroughly assessed in future studies; it is recommended to ascertain the reasons for this discrepancy and to ensure that all physicians are aware of such tool regardless of the patient socioeconomic status.

The results of our study come in agreement with Ontario study where around 96% of primary care physicians were aware of at least one CVD risk score. Doroodchi study showed years of experience, and a number of patients seen were inversely associated with following the guideline recommendations, but there was no significant association between knowledge level and years of experience of the participated physicians [20]. Furthermore, medications cost and adherence, inadequate time for counseling, knowledge, and skills to recommend dietary changes were cited as the significant barriers to CVD [20]. This was more or less in accordance with the barriers reported in the current study. Another study reported that physicians cited fear regarding risk assessment over-simplification or overuse of medical therapy (54%), and believing that the numerical information resulting from prediction rules is frequently not helpful for decision making as key reasons why risk assessment was not implemented [21].

In our analysis, over 40% of family physicians were not aware of the ASCVD risk estimator and were not using it. That highlights indication and the need for education as it pertains to improving their attitude and patient care provided. Efforts to increase the knowledge and awareness of ASCVD among practicing physicians may be beneficial in improving patient care, especially the high-risk population. Different educational training methods include handouts, tele-lectures, and live-lectures that explain in-details the tool which will aid providers in their practice. Additionally, using real case examples will help visualization of the tool implication.

Our study is not without limitations. First, it was a single-center study which affects its generalizability to different other regions. Secondly, the data obtained was self-reported and the probability of biasing cannot be ruled out. The cross-sectional survey design of the current study does not allow for causal inferences to be drawn and future study designs like cohort and longitudinal designs are needed. However, to the best of our knowledge, our study is considered the first to assess the knowledge, attitude, and barriers to use of ASCVD among PCPs in Saudi Arabia.

## CONCLUSION

Health promotion implementation needs using powerful primary prevention of cardiovascular risk calculators. Therefore, enhancing family physician knowledge and eliminate obstacles will gradually improve their attitude towards disease prediction and prevention. Further research is needed to understand how to increase the overall awareness and use of the ASCVD risk estimator among family care physicians, as well as to promote the ways in which these tools can improve patient outcomes.

## DECLARATIONS

### Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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