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Original Article

Development and validation of a KAP questionnaire on ASCVD risk assessment among Saudi physicians: pilot study

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ABSTRACT

Assessing physicians' KAP is critical to identifying gaps in ASCVD risk assessment practices, which are often suboptimal in the Middle East. Validated tools are lacking in this region, hindering targeted interventions to improve guideline adherence and patient outcomes. To evaluate physicians' knowledge, attitudes, and practices on atherosclerotic cardiovascular disease risk through a newly developed questionnaire to enhance evaluation and prevention. This cross-sectional investigation validated a questionnaire on physicians' knowledge, attitudes, and practices in atherosclerotic cardiovascular disease possibility evaluation among statin prescribers in Hail, Saudi Arabia. Convenient sampling was used, targeting physicians with at least one year of post-residency experience. The questionnaire demonstrated strong reliability across all domains. Knowledge domain: Cronbach's Alpha >0.8, ITC 0.46–0.77, and significant correlations ($p < 0.001$, $r = 0.574$–0.825), with K6 ($r = 0.825$) and K7 ($r = 0.785$) showing strong validity. Attitude domain: Cronbach's Alpha 0.928–0.94, ITC ≥0.53, and correlations ($r = 0.611$–0.859, $p < 0.001$), with A2, A4, A7, A9 (>0.85) being the strongest. Practice domain: Cronbach's Alpha 0.916–0.933, ITC ≥0.543, and correlations ($r = 0.63$–0.90, $p < 0.001$), with P2 ($r = 0.90$) and P6 ($r = 0.835$) being the strongest. The overall questionnaire revealed excellent reliability (Cronbach's Alpha 0.931), and the KAP questionnaire was highly consistent (Cronbach's Alpha 0.913), confirming its validity for ASCVD risk assessment. The Knowledge, Attitude, and Practice (KAP) questionnaire is reliable and valid for assessing physicians' perspectives on ASCVD risk, with strong consistency and expert validation.

Keywords: Face validation, ASCVD, Content validation, KAP, Atherosclerosis

Introduction

Cardiovascular disease (CVD) is a cardiac disorder characterized by damaged vessels, structural abnormalities, and thrombosis. It primarily refers to injury or disease in the heart's principal blood arteries. It results in unexpected cardiac dysfunction and respiratory issues [1]. Cardiovascular disease is a frequent disorder and a significant contributor to health damage. Cardiovascular disease continues to be the predominant etiology of worldwide mortality, accounting for more than thirty percent of global mortality in 2015 [2].

The World Health Organization (WHO) estimates that 17.9 million cases succumbed to cardiovascular diseases (CVDs) in 2016, accounting for thirty-one percent of global mortality. Significantly, eighty-five percent of these fatalities arise from heart attacks and strokes, with more than three-quarters of cardiovascular disease deaths occurring in low and middle-income countries [3].

Hyperlipidemia is defined as an imbalance in the plasma levels of low-density lipoprotein cholesterol (LDL-C), high-density lipoprotein cholesterol (HDL-C), or triglycerides (TG) [4].

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Increased blood lipid levels are regarded as a significant modifiable risk factor for the onset of cardiovascular illnesses and atherosclerosis [5].

Atherosclerosis is a persistent inflammatory disorder of the arteries, responsible for over fifty percent of the deaths in Western countries. The procedure is predominantly lipid-driven, introduced by the accumulation of low-density lipoprotein and residual lipoprotein particles, accompanied by an active inflammatory response in specific parts of arteries, especially at locations of disrupted non-laminar flow near arterial bifurcations. This phenomenon is considered a primary contributor to ASCVD, resulting in myocardial infarctions, cerebrovascular accidents, and peripheral artery disease [6]. Atherosclerotic cardiovascular disease has a complex etiology that includes multiple factors. The primary risk factors include hypercholesterolemia (LDL cholesterol) and hypertension, DM, tobacco use, age (males over forty-five years and females over fifty-five years), male sex, and a significant family history (male relatives under fifty-five years and female relatives under sixty-five years) [7].

The Institute for Health Metrics and Evaluation (IHME) has demonstrated that cardiovascular diseases (CVDs) are the primary etiology of mortality in the Arab world. Moreover, risk factors for cardiovascular disease, involving obesity and DM, are prevalent and have been increasing globally [3].

Cardiovascular disease exacts a significant burden on cases, their families, and governments equally [8]. Consequently, the prevention and reversal of cardiovascular disease growth is a public health need. The assessment of risk for ASCVD is fundamental to primary prevention. The existing clinical practice recommendations for dyslipidaemia therapy and primary cardiovascular disease prevention advocate for a cardiovascular disease risk assessment for qualified cases [9].

Various guidelines offer distinct risk score calculators for evaluating the ten-year cardiovascular risk. The 2008 Framingham General risk for cardiovascular disease calculator uses characteristics such as age, gender, total HDL cholesterol, systolic blood pressure, antihypertensive treatment, DM history, and current smoking status. The 2013 ACC/AHA risk calculator involves nearly identical parameters to the 2008 Framingham general cardiovascular diseases model; however, it distinguishes itself by involving race and exclusively assessing hard atherosclerotic cardiovascular disease risk endpoints (CHD death, nonfatal myocardial infarction, fatal & nonfatal stroke) [10].

Physicians are important in the management and prevention of cardiovascular disease (CVD). Consequently, having sufficient information and favorable attitudes regarding cardiovascular risk evaluation is crucial for enhancing case outcomes in practice [11]. Data concerning physicians' attitudes, knowledge, and practices surrounding risk evaluation for atherosclerotic cardiovascular illnesses is limited, particularly in the Middle East. This study aimed to develop and validate a questionnaire for assessing knowledge, attitudes, and practices regarding ASCVD risk assessment. The tool's psychometric properties (reliability, content/face validity) were evaluated to ensure its suitability for future KAP studies.

Materials and Methods

Study design

This research was a cross-sectional study undertaken to develop and analyse the validity of physicians' knowledge, Attitudes, and practices towards the risk assessment of atherosclerotic cardiovascular diseases questionnaire for statin-prescribing physicians in the Hail region in Saudi Arabia. For the sampling method of face validation and content validation, convenience sampling was used to select physicians to answer the content and face validation.

Inclusion and exclusion criteria

Inclusion criteria

Statin prescribers were defined as physicians actively involved in ASCVD risk assessment and statin therapy initiation, with ≥1-year post-residency experience. Specialists in cardiology and internal medicine.

Exclusion criteria

Retired Physicians, non-users of risk calculators, and incomplete survey responses.

Item development

The questionnaire on physicians' knowledge, attitudes, and practices regarding the risk assessment of ASCVD was developed in English and reviewed by seven expert statin-prescribing physicians, two senior clinical pharmacists, and one consultant clinical pharmacy lecturer in Saudi Arabia.

The questionnaire has been designed based on a comprehensive literature review and prior research studies to ensure that it effectively achieves the study objectives. The questionnaire was structured into three distinct domains: knowledge, attitude, and practice, specifically targeting physicians who prescribe statins. Statin prescribers in this study were defined as licensed physicians actively involved in cardiovascular risk management, including specialties such as internal medicine, cardiology, endocrinology, and family medicine. Eligible physicians were those who routinely assess ASCVD risk and prescribe statins for primary or secondary prevention.

The review's objective was to identify common gaps in knowledge, attitudes, and practices among physicians. This allowed us to identify the important areas for the questionnaire, ensuring that it addressed essential topics such as understanding ASCVD risk calculations and guidelines, beliefs about the importance and reliability of risk assessment, frequency of risk assessments, and patient counseling. We decided on the items for each domain based on their relevance to the target demographic,

their frequency of citation in the literature, and the need to fully understand KAP.

A thorough literature review was conducted by systematically searching and analyzing academic databases, including PubMed, Scopus, and Google Scholar, to identify relevant theories, existing instruments, and knowledge gaps related to the research topics. The process began by defining clear research objectives and developing a list of key concepts and keywords aligned with the study's focus, including "ASCVD risk," "risk calculator," "physicians," and "KAP." These keywords were used to conduct searches in the selected databases, with filters applied to refine results by relevance, date, and study type. Titles and abstracts were reviewed to select studies directly addressing the research question, which were then analyzed in detail to understand their methodologies, findings, and limitations.

Information was organized into themes corresponding to the questionnaire domains (knowledge, attitude, practice), and the quality of the literature was critically assessed to ensure the review was comprehensive and up to date. Expert input and content validation were used to refine the final questionnaire prior to data collection, ensuring it was contextually appropriate and relevant.

The development process involved two key steps: (1) item generation, content validity, and face validity, and (2) scale evaluation (reliability and construct validity). This study focused on the first step, reporting methods and results related to item generation and validation [12]. Content validity was established to confirm the accuracy and relevance of the questionnaire items, while face validity was assessed to evaluate clarity and cultural appropriateness [13].

Content validity

The content validity index (CVI) depends on an evaluation of the relevance of the questionnaire [13]. The content validity survey included a cover letter and Doctors' knowledge, Attitudes, and practices towards the risk assessment of atherosclerotic cardiovascular diseases, with clear and unambiguous instructions on how to score each question. Ten experts were chosen to examine the content validity of this study. To evaluate the content validity of the questionnaire, I identified experts who met specific professional and clinical criteria relevant to the study topic. I selected a total of ten experts based on their qualifications, clinical roles, and experience in managing patients at risk of ASCVD. The selection included seven physicians specialized in statin prescribing, two senior clinical pharmacists with expertise in cardiovascular pharmacotherapy, and one consultant clinical pharmacy lecturer who has academic and clinical experience in guideline-based dyslipidemia management. All experts were practicing in Saudi Arabia and had direct involvement in ASCVD risk assessment, statin prescribing, or clinical education on lipid management.

These experts were chosen to ensure that the questionnaire would be reviewed by individuals with practical, clinical, and academic expertise in ASCVD risk assessment and statin therapy. Their input helped assess the clarity, relevance, and comprehensiveness of the questionnaire items [14]. An expert reviewed and critiqued the prepared questionnaire to make sure it was a reliable and practical assessment questionnaire.

The validation form and questionnaire were distributed electronically via email, with a 4-week deadline for completion. Two reminder emails were sent to non-respondents, achieving a 100% response rate.

Content validity analysis

The assessment of content validity has been conducted by requesting the same experts to assess the relevance of each item utilizing four Likert scales (four = highly relevant, three = relevant, two = irrelevant, one = very irrelevant) [15]. For computing the CVI, the relevance rating is categorized as 1 (on a three or four-point relevance scale) or 0 (on a relevance scale of 1 or 2). The rating scores of 3 and 4 are acceptable [13].

CVI is classified into 2 types: item-level content validity index (I-CVI) & scale-level content validity index (S-CVI). There are 2 procedures for calculating the S-content validity index: the mean of the I-content validity index scores for all scale items (S-CVI/Ave) and the proportion of scale items that reach a relevance scale of three or four by all experts (S-CVI/UA). The content validity index was set at least 0.83, and the item-level content validity index and S-content validity index were both at least 80% of the CVI [15].

The CVI indices' definitions and formulas are summarized: Item-level content validity index = (The total number of experts who rated an item as three or four) / (The total number of experts), S-CVI/Ave = (Sum of I-CVI) / (Number of items in total). S-CVI/UA = (Number of items regarded as relevant by all experts) / (Number of items in total)

Face validity

Face validity was determined after content validity using the revised version of Physicians' Knowledge, Attitudes, and Practices towards the risk assessment of ASVCD diseases. Face validity process to validate the revised version of the questionnaire by an expert review [16].

Face validity was assessed with 10 participants who met the inclusion criteria (Separate group from content experts, 10 physicians meeting the same inclusion criteria as study participants (statin prescribers, ≥1-year post-residency) to identify any difficulties, ambiguities, or culturally sensitive issues within the questionnaire [17]. Participants for face validity were recruited separately from content experts, comprising 10 statin-prescribing physicians meeting the inclusion criteria. The revised questionnaire (Version 2.0) was administered in-person during departmental meetings, with real-time clarification provided by the research team. Forms were collected immediately after completion to ensure compliance.

Face validity analysis

The face validity index (FVI) was utilized for this face validity analysis. The clarity of questionnaire items was analysed using

FVI. This was conducted for the domain of knowledge, attitude, and practice. The items have been rated according to a Likert scale ranging from one (not clear) to four (very clear). For computing the FVI, the clarity rating is categorized as 1 (on a 3- or 4-point clarity scale) or 0 (on a clarity scale of 1 or 2). The rating scores of 3 and 4 are acceptable [18].

I-FVI (item-level face validity index), S- face validity index (scale-level face validity index), S-FVI/UA (scale-level face validity index, universal agreement calculation formula), and S-FVI/Ave (scale-level face validity index, averaging calculation formula) were all utilized to calculate the results.

The FVI scores are interpreted depending on the content validity index guidelines. The FVI should be at least 0.83. The acceptable score is at least 80% or higher agreement.

The I-FVI has been measured by separating the rate of agreement by the total number of items. The rater's agreement is a sum from the clarity rating, which means an item rated three or four would be transformed to clarify ('1'), and an item rated 1 or 2 would be transformed to non-clarify ('0') [18].

S-FVI/Ave has been determined with two methods. The 1st technique was to get the total I-FVI value and divide it by the number of items. The 2nd method was to get the average value of each ratter based on clarity, which was adapted from the CVI calculation method. The S-FVI/ UA has been measured by total acceptance of the number of items that had hundred percent agreement, which means they were transformed to valid ('1') as a universal agreement (UA), and the item that had not achieved hundred percent agreement was transformed to nonvalid ('0') and separated by the total number of items in each domain that was adapted from the CVI calculation method [19].

Statistical analysis

Data have been examined utilizing SPSS, version 25.0 (IBM Corp., Armonk, NY, United States of America). This investigation utilized both inferential and descriptive analysis. Percentages have been utilized for categorical factors, whereas the median and interquartile range have been utilized for the total scores. We utilized the Kruskal-Wallis test and the Mann-Whitney U test to assess the correlation among participants' baseline characteristics and their overall knowledge, attitudes, and practices. A P value less than 0.05 signifies a statistically significant distinction.

Results and Discussion

Reliability

Knowledge

Table 1. Cronbach's Alpha if item deleted and Corrected Item-Total association (ITC) of the physicians' knowledge, attitude and practice items and correlation of the physicians' knowledge attitude, practice items with the total knowledge, attitude and and practice domain.

Knowledge	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Correlation of each item to total domain, r (p value)
K1- Physicians know the clinical variables required to estimate a patient's 10-year ASCVD risk using the SCORE (Systematic Coronary Risk Evaluation) recommended by the Saudi Dyslipidemia Guidelines (adapted from ESC/EAS 2019)?	0.61	0.838	0.706 (<0.001*)
K2- Physicians know how to apply the SCORE (Systematic Coronary Risk Evaluation) to assess 10-year cardiovascular risk in eligible patients?	0.67	0.834	0.738 (<0.001*)
K3- Physicians know how to interpret the SCORE (Systematic Coronary Risk Evaluation) risk scores and what thresholds they use to determine the appropriateness of statin therapy initiation?	0.517	0.849	0.64 (<0.001*)
K4 Physicians know that in Saudi adults aged 20–39 years, traditional ASCVD risk factors should be assessed at least every 4 years?	0.46	0.853	0.574 (<0.001*)
K5- Physicians know that the coronary artery calcium score is used to guide atherosclerotic cardiovascular disease risk assessment?	0.51	0.848	0.629 (<0.001*)
K6- Physicians know what information should be communicated to patients when explaining ASCVD risk assessment (using SCORE)results and discussing the risks and benefits of statin therapy?	0.77	0.824	0.825 (<0.001*)
K7- Physicians are aware of the modifiable and non-modifiable cardiovascular risk factors.	0.71	0.828	0.785 (<0.001*)
K8- Physicians know that total ASCVD risk estimation using the SCORE (Systematic Coronary Risk Evaluation) is recommended in Saudi Arabia, even though it has not yet been validated for the Saudi population?	0.517	0.847	0.615 (<0.001*)
K9- Physicians know that the SCORE charts classify patients into low, moderate, high, and very high cardiovascular risk categories?	0.50	0.85	0.625 (<0.001*)

Attitude	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	r (p value)
A1-Evaluating ASCVD risk is crucial in determining when to start statin therapy.	0.783	0.931	0.818 (<0.001*)
A2- The physicians are confident in the accuracy of ASCVD risk assessment tools (SCORE) in predicting patient outcomes.	0.82	0.928	0.859 (<0.001*)
A3- Physicians rely on ASCVD risk assessment scores (SCORE) as a key component in their clinical decision-making.	0.76	0.931	0.818 (<0.001*)
A4- Physicians recognize the importance of routinely performing a 10-year ASCVD risk calculation for eligible adults, but also acknowledge the need for earlier assessment in younger high-risk individuals.	0.81	0.929	0.858 (<0.001*)
A5- The physicians believe ASCVD risk assessment results are helpful for motivating patients to make lifestyle changes.	0.645	0.936	0.706 (<0.001*)
A6- I feel confident in my understanding of current ASCVD risk assessment guidelines.	0.78	0.93	0.826 (<0.001*)
A7- Educating patients about their ASCVD risk feels challenging and requires additional support.	0.809	0.928	0.851 (<0.001*)
A8-I consider ASCVD risk assessment tools to be useful aids in clinical practice, but I always interpret their results alongside patient-specific clinical judgment.	0.53	0.94	0.611 (<0.001*)
A9-Incorporating ASCVD risk scores into clinical notes and patient records is valuable for improving patient outcomes.	0.81	0.928	0.85 (<0.001*)
A10-I would be willing to attend additional training sessions on ASCVD risk assessment if offered by my healthcare organization.	0.784	0.93	0.833 (<0.001*)
Practice	**Corrected Item-Total Correlation**	**Cronbach's Alpha if Item Deleted**	**r (p value)**
P1- How often do you conduct atherosclerotic cardiovascular disease (ASCVD) risk assessments (SCORE) as part of the primary prevention of ASCVD?	0.818	0.919	0.858 (<0.001*)
P2- How often do you use ASCVD risk calculators or tools (SCORE)to guide statin therapy decisions?	0.866	0.916	0.9 (<0.001*)
P3- How frequently do you evaluate patients for existing liver diseases before prescribing statins?	0.689	0.927	0.74 (<0.001*)
P4- .How often do you review patients' current medications to identify possible drug interactions with statins?	0.543	0.933	0.63 (<0.001*)
P5- How often do you discuss the importance of adhering to statin therapy with your patients?	0.763	0.933	0.805 (<0.001*)
P6- How frequently do you review a patient's family history of cardiovascular disease before initiating statin therapy?	0.80	0.922	0.835 (<0.001*)
P7- How often do you incorporate ASCVD risk scores into your clinical notes and patient records?	0.75	0.923	0.81 (<0.001*)
P8- To what extent do you assess patients for potential side effects (e.g., history of muscle issues and risk factors for new-onset diabetes mellitus (NODM)) before starting statin therapy?	0.685	0.927	0.756 (<0.001*)
P9- How regularly do you calculate the ten-year ASCVD risk for cases aged 40 to 69 years?	0.705	0.925	0.769 (<0.001*)
P10- How frequently do you review patients' lifestyle habits (such as diet, physical activity, BMI, and tobacco use) before prescribing statins?	0.755	0.923	0.808 (<0.001*)

Table 1 demonstrates strong internal consistency within the knowledge domain, with Cronbach's Alpha values exceeding 0.8 for all items if deleted, suggesting highly reliability. The Corrected Item-Total Correlation (ITC) values range from 0.46 to 0.77, with most values above 0.5, indicating acceptable to strong item correlations with the total score. **Table 1** indicates high reliability in the attitude domain, with Cronbach's Alpha values varying from 0.928 to 0.94 if any item is deleted, highlighting minimal impact on the scale's consistency. Corrected ITC values are mostly strong, with A8 (ITC = 0.53) being the lowest but still acceptable. **Table 1** indicates strong reliability in the practice domain, with Cronbach's Alpha values

varying from 0.916 to 0.933 if any item is deleted, suggesting the scale remains strong. Corrected ITC values are mostly strong, with P4 (ITC = 0.543) being the lowest but still acceptable.

Also, there is significant correlations ($p < 0.001$) between individual knowledge items and the total domain score, which ranges from $r = 0.574$ to $r = 0.825$. Items such as K6 ($r = 0.825$) and K7 ($r = 0.785$) demonstrate strong correlations, highlighting their validity within the knowledge construct. **Table 3** reveals significant correlations ($p < 0.001$) between attitude items and the total score, which range from $r = 0.611$ to $r = 0.859$. A2, A4, A7, and A9 show particularly strong correlations (>0.85), highlighting their validity in assessing physicians' attitudes. **Table 3** shows significant correlations ($p < 0.001$) between practice items and the total score, ranging from $r = 0.63$ to $r = 0.90$. Items like P2 ($r = 0.90$) and P6 ($r = 0.835$) exhibit particularly strong relationships, reinforcing their relevance to the practice construct.

Table 2. Total Cronbach's Alpha of the physicians' knowledge domain.

Reliability Statistics of knowledge domain		
Cronbach's Alpha	**Cronbach's Alpha Based on Standardized Items**	**N of Items**
0.857	0.86	9
Reliability Statistics of attitude domain		
Cronbach's Alpha	**Cronbach's alpha depending on Standardized Items**	**N of Items**
0.938	0.939	10
Reliability Statistics of practice domain		
Cronbach's Alpha	**Cronbach's Alpha Based on Standardized Items**	**N of Items**
0.931	**0.934**	**10**
Reliability Statistics for all KAP questionaire		
Cronbach's Alpha	**Cronbach's Alpha Based on Standardized Items**	**N of Items**
0.913	0.878	29

Table 2 confirms the knowledge domain's reliability, with a Cronbach's Alpha of 0.857 and standardized items at 0.86. **Table 2** reveals high overall reliability, with a Cronbach's Alpha of 0.938 and standardized items at 0.939. **Table 2** confirms excellent overall reliability, with a Cronbach's Alpha of 0.931 and standardized items at 0.934 also there is strong reliability for the combined Knowledge, Attitude, and Practice (KAP) questionnaire, with a Cronbach's Alpha of 0.913 and standardized items at 0.878. This indicates the questionnaire is highly internally consistent across all domains, making it a reliable tool for assessing physicians' KAP regarding ASCVD risk assessment.

Table 3. The relevance ratings on the item scale by ten experts for KAP

Item No	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	Expert 8	Expert 9	Expert 10	Experts in Agreement	I-CVI	UA
Q1	4	3	2	3	3	3	3	4	3	4	9	0.9	1
Q2	3	4	4	4	4	4	4	4	4	3	10	1	0
Q3	4	4	4	4	4	4	4	3	3	4	10	1	1
Q4	4	4	4	4	4	4	4	4	4	4	10	1	1
Q5	4	4	4	4	4	3	4	4	4	4	10	1	1
Q6	4	2	3	4	3	4	4	4	4	4	9	0.9	0
Q7	3	4	4	3	4	4	4	4	4	3	10	1	1
Q8	4	4	4	4	4	4	4	4	4	4	10	1	1
Q9	4	4	4	4	4	4	3	4	4	4	10	1	1
Q10	4	3	4	4	4	4	4	4	4	3	10	1	1
Q11	4	3	3	4	3	3	4	3	3	4	10	1	1
Q12	4	4	4	4	4	4	4	4	4	4	10	1	1
Q13	4	4	4	4	4	4	4	4	4	4	10	1	1
Q14	4	4	4	4	3	4	4	4	4	4	10	1	1
Q15	4	4	4	4	4	4	4	4	4	4	10	1	1
Q16	3	4	4	4	4	4	3	3	4	4	10	1	1
Q17	4	4	4	4	4	4	4	4	4	4	10	1	1
Q18	4	4	3	4	4	3	4	4	4	4	10	1	1
Q19	4	4	4	4	4	4	4	4	4	4	10	1	1
Q20	4	4	4	4	4	4	4	4	4	4	10	1	1
Q21	4	4	4	3	4	4	4	4	4	4	10	1	1
Q22	4	3	4	4	3	3	4	4	4	4	10	1	1
Q23	4	4	4	4	4	4	4	4	4	4	10	1	1
Q24	3	4	4	4	4	4	3	4	3	4	10	1	1
Q25	3	4	4	4	4	4	4	3	4	4	10	1	1
Q26	3	3	4	3	4	4	4	4	4	4	10	1	1
Q27	4	4	4	4	3	4	4	4	4	3	10	1	1

Q28	3	4	3	4	4	4	4	4	4	4	10	1	1
Q29	3	4	4	4	4	4	4	4	4	4	10	1	1
Proportion relevance	29/29= 1	29/29= 1	28/29= 0.965	28/29= 0.965	29/29= 1	29/29= 1	29/29= 1	29/29= 1	29/29= 1	29/29= 1		S-CVI/Av= 28.8/29= 0.993 S-CVI/UA= 27/29=0.93	

Table 3 highlights excellent content validity, with Item-Level Content Validity Index (I-CVI) values ranging from 0.9 to 1, indicating high agreement among experts on item relevance. The Scale-Level Content Validity Index (S-CVI/UA = 0.93) and average S-CVI (S-CVI/Av = 0.993) further confirm strong expert consensus. The proportion of relevant items is ≥0.965 for most questions, underscoring the questionnaire's validity and relevance in assessing physicians' KAP.

Face Validity Index (I-FVI)

Table 4. FVI on knowledge, attitude and practice by 10 Respondents: Items Rated as 3 or 4 on Clarity Scale

Item No. (Knowledge)	Respondent Agreement	I-FVI	Interpretation
K1	10	1.00	Appropriate
K2	10	1.00	Appropriate
K3	10	1.00	Appropriate
K4	10	1.00	Appropriate
K5	10	1.00	Appropriate
K6	10	1.00	Appropriate
K7	10	1.00	Appropriate
K8	10	1.00	Appropriate
K9	10	1.00	Appropriate
Item No. (Attitude**)**	Respondent Agreement	I-FVI	Interpretation
A1	10	1.00	Appropriate
A2	10	1.00	Appropriate
A3	10	1.00	Appropriate
A4	10	1.00	Appropriate
A5	10	1.00	Appropriate
A6	10	1.00	Appropriate
A7	10	1.00	Appropriate
A8	10	1.00	Appropriate
A9	10	1.00	Appropriate
A10	10	1.00	Appropriate
Item No. (Practice**)**	Respondent Agreement	I-FVI	Interpretation
P1	10	1.00	Appropriate
P2	10	1.00	Appropriate
P3	10	1.00	Appropriate
P4	10	1.00	Appropriate
P5	10	1.00	Appropriate
P6	10	1.00	Appropriate
P7	10	1.00	Appropriate
P8	10	1.00	Appropriate
P9	10	1.00	Appropriate
P10	10	1.00	Appropriate

Table 4 showed that all items (K1–K9) achieved an Item-level Face Validity Index (I-FVI) of 1.00, indicating that all 10 respondents rated each item as either "3" or "4" on the clarity scale. This suggests excellent clarity and appropriateness of all

knowledge-related questionnaire items, with no need for item modification or rewording. The consistent maximum score across all items supports the content's face validity and implies a strong consensus among respondents regarding item understandability. All attitude items (A1–A10) demonstrated an Item-level Face Validity Index (I-FVI) of 1.00, with full agreement from all 10 respondents rating each item as clear (score 3 or 4). This reflects a very high level of clarity and face validity, indicating that all attitude items were deemed appropriate and well-constructed. The uniformity in scores suggests no revisions are necessary, and the items are well understood by the target population. All practice-related items (P1–P10) obtained an Item-level Face Validity Index (I-FVI) of 1.00, indicating unanimous agreement among the 10 respondents that each item was clear and appropriate (rated 3 or 4). This reflects excellent face validity of the practice domain items, confirming that the wording and structure are clear, understandable, and relevant to the intended construct. No modifications are recommended.

This study introduces the first validated Knowledge, Attitudes, and Practices (KAP) questionnaire tailored for ASCVD risk assessment among physicians in the Middle East. While prior tools exist globally, none have been specifically designed or validated for the Middle Eastern context. Regional disparities in healthcare infrastructure, cultural perceptions of risk communication, and variations in guideline adoption necessitate a localized tool. For instance, our questionnaire uniquely integrates statin prescribing behaviors and updated ASCVD risk thresholds, aligning with Saudi Arabia's clinical practices. This addresses critical gaps in prior tools, which often lack regional specificity and updated guidelines.

Knowledge

The current study demonstrated strong internal consistency within the knowledge domain, with Cronbach's Alpha values exceeding 0.8 for all items if deleted, suggesting high reliability. The Corrected Item-Total Correlation (ITC) values range from 0.46 to 0.77, with most values above 0.5, indicating acceptable to strong item correlations with the total score. Confirm the knowledge domain's reliability, with a Cronbach's Alpha of 0.857 and standardized items at 0.86.

In agreement with Al-Ashwal *et al.* [20], who evaluated the physicians' knowledge, attitudes, and practices according to ASCVS risk evaluation, findings indicated that knowledge was superior among consultants, cases from the cardiology department, and those with over nine years of experience; overall, physicians exhibited a low level of knowledge. It is advisable for physicians to have exercise and continuing medical education on cholesterol treatment and 1ry preventive clinical practice guidelines. The computed Cronbach's alpha for awareness was 0.70.

Furthermore, Abebe *et al.* [21] evaluated the extent of cardiovascular disease risk variables alongside public awareness, attitudes, and practices, discovering a robust correlation among knowledge levels and various characteristics. Cases with higher education levels, who didn't regularly add salt to their meals, involved moderate to high incomes, have been utilized in government positions, and performed fewer daily hours of sedentary activity, attained higher knowledge scores.

Similar findings were revealed in our study; Gharaibeh *et al.* [22] found that almost half of the patients who used statins for the secondary prevention of ASCVD were undertreated, and there was a lack of knowledge among physicians.

The present study demonstrated significant correlations ($p < 0.001$) between individual knowledge items and the total domain score, which ranged from $r = 0.574$ to $r = 0.825$. Items such as K6 ($r = 0.825$) and K7 ($r = 0.785$) demonstrate strong correlations, highlighting their validity within the knowledge construct.

The results indicated that improving physicians' understanding in these areas could help address knowledge gaps and enhance clinical practices, which may lead to better outcomes for patients at risk of ASCVD [23].

Also, Rababa'h *et al.* [24] revealed that domain appraisals participants' general awareness of atherosclerosis cardiovascular disease risk calculator, along with the recognition of the significance of such awareness in pharmacy practice, there were significant correlations ($p < 0.001$) between individual knowledge items and the total domain score.

Attitude

Our findings revealed high reliability in the attitude domain, with Cronbach's Alpha values ranging from 0.928 to 0.94 if any item is deleted, highlighting minimal impact on the scale's consistency. Corrected ITC values are mostly strong, with A8 (ITC = 0.53) being the lowest but still acceptable. High overall reliability, with a Cronbach's Alpha of 0.938 and standardized items at 0.939 [25-27].

Our findings revealed significant correlations ($p < 0.001$) between attitude items and the total score, which ranged from $r = 0.611$ to $r = 0.859$. A2, A4, A7, and A9 show particularly strong correlations (>0.85), highlighting their validity in assessing physicians' attitudes.

In line with Al-Ashwal *et al.* [20], a strong positive disposition towards CVS risk assessment has been seen, with a computed Cronbach's alpha of 0.81 for attitude.

Additionally, Rababa'h *et al.* [24] demonstrated a favorable disposition among pharmacists regarding the significance of their involvement in controlling cases with dyslipidemia. Nearly half of the participants (47.0 percent) showed assertiveness and preparedness to deliver health preventative consultations for cardiovascular disease to the case. Their investigation enhances the existing literature about pharmacists' knowledge, awareness, and attitudes toward cardiovascular disease risk assessment and lipid-lowering medications.

Mastourah *et al.* [28] evaluated the knowledge, attitudes, and obstacles faced by primary health care professionals in utilizing the ASCVD risk estimator inside a family health care facility. It has been revealed that knowledge of ASCVD was substantially correlated with participants' clinical attitudes; they have a

positive attitude about the ASCVD risk calculator, 37.3% towards it [29-33].

Practice

The present study indicated strong reliability in the practice domain, with Cronbach's Alpha values varying from 0.916 to 0.933 if any item is deleted, suggesting the scale remains strong. Corrected ITC values are mostly strong, with P4 (ITC = 0.543) being the lowest but still acceptable. Confirms excellent overall reliability, with a Cronbach's Alpha of 0.931 and standardized items at 0.934 [34-36].

In support of Al-Ashwal *et al*. [20] found that Practices were more prevalent among participants, consultants from the cardiology department, cases with over nine years of experience, and those who indicated adherence to a particular guideline for cholesterol control or the utilization of a risk calculator in their practice. Physicians exhibited inadequate practices. The computed Cronbach's alpha for the patients-physician discussion practice was 0.71.

This study showed significant correlations ($p < 0.001$) between practice items and the total score, ranging from $r = 0.63$ to $r = 0.90$. Items like P2 ($r = 0.90$) and P6 ($r = 0.835$) exhibit particularly strong relationships, reinforcing their relevance to the practice construct. There was a strong reliability for the combined Knowledge, Attitude, and Practice (KAP) questionnaire, with a Cronbach's Alpha of 0.913 and standardized items at 0.878. This indicates the questionnaire is highly internally consistent across all domains, making it a reliable tool for assessing physicians' KAP regarding ASCVD risk assessment.

In line with Al-Ashwal *et al*. [20], it was revealed that the computed Cronbach's alpha for risk assessment practices was 0.75. Physicians who reported counseling a higher number of cases daily had diminished risk assessment and counseling techniques.

Similarly, Abebe *et al*. [21] discovered that only 56.4 percent of cases had an excellent knowledge score about cardiovascular disease risk factors. In comparison to the investigation performed in Bonga, Ethiopia, the percentage of high atherosclerosis cardiovascular disease risk cases receiving the main statin preventative medication (42.93 percent, CI: 0.380757–0.4792542) has been found to be comparable to forty percent [37]. In contrast to the investigation performed at Jimma Medical Centre, Ethiopia (36.6 percent), this analysis revealed a greater percentage of high atherosclerosis cardiovascular disease risk cases receiving main statin preventative medication (42.93 percent, CI: 0.380757–0.4792542) [38]. The relatively greater percentage of cases receiving 1st statin preventive treatment, despite a similar context, can be attributed to the temporal disparity between the two investigations, which facilitates enhanced knowledge and improved practices, potentially explaining the observed distinctions. The present study showed excellent content validity, with Item-Level Content Validity Index (I-CVI) values ranging from 0.9 to 1, indicating high agreement among experts on item relevance. The Scale-Level Content Validity Index (S-CVI/UA = 0.93) and average S-CVI (S-CVI/Av = 0.993) further confirm strong expert consensus. The proportion of relevant items is ≥0.965 for most questions, underscoring the questionnaire's validity and relevance in assessing physicians' KAP.

In accordance with Jovanovic [39] found that the quantitative analysis Item-Level Content Validity Index has been calculated [40]. The content Validity Index values showed strong concordance between experts and satisfactory content validity. The content validity index aids in determining whether to exclude, modify, or maintain an item [41, 42]. To achieve optimal content validity, the minimum recommended value for the Content Validity Index (CVI) is an Item-CVI (I-CVI) of no less than 0.78 [43].

Conclusion

This study successfully developed and validated a reliable, culturally adapted KAP questionnaire for assessing physicians' perspectives on ASCVD risk assessment in Saudi Arabia. The tool's strong psychometric properties (Cronbach's $\alpha = 0.913$) and expert consensus on content validity (S-CVI/UA = 0.93) establish it as a foundational resource for future interventions targeting guideline adherence and ASCVD prevention in the Middle East.

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Informed consent to participate was obtained from all participants prior to data collection via a structured Google Form, which included a clear consent statement approved by the ethics committee.

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