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## Association between Knowledge, Attitude and Practice on Cardiovascular Disease among Women in Kelantan, Malaysia

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### Abstract

**Introduction:** Cardiovascular disease (CVD) has been realized as a primary cause of death in women for almost a century. However, the relationship between women's knowledge, their wish and action on practicing heart healthy lifestyle is still vague.

**Aim and Objectives:** This research aimed to determine the association between knowledge and attitude, knowledge and practice and attitude and practice on cardiovascular disease among women in Kelantan.

**Methods/ Study Design:** A cross sectional study was conducted in Kelantan, Malaysia. A total of 448 women attended primary care facilities in Kelantan were included in this study. Two-stage sampling process was used to select clinics in all districts in Kelantan followed by female participants from selected clinics attendance lists. Recruited were non illiterate young adult women up to 65 years of age and without psychotic symptoms. Consented participants were given a set of validated KAP questionnaire that should be completed within 15 minutes.

**Findings:** The respondents' mean age was about 40 years with majority of them having secondary educational level and coming from low socio-economic group. Among them, 56.8% involved in tobacco products and 41.3% reported as having CVD related medical illnesses, especially obesity (23.7%) and hypertension (17.6%). About 56.2% had family history of CVD risk. Only 26.8% of them obtained the CVD information from health care workers. The good knowledge, attitude and practice score were 55.6%, 55.1 % and 51.1% accordingly. There were significant association between attitude and knowledge, practice and knowledge and practice and attitude which were found to be strong (0.10, 0.20), (0.10, 0.18) and (0.26, 0.40) 95% CI, respectively and is independent with socio-demographic and personal disease characteristic.

**Conclusion:** Positive relationship between knowledge, attitude and practice will encourage primary care doctors to take this challenge to educate, motivate community and provide full support to those who wish to modify their lifestyle.

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**Keywords:** Knowledge, Attitude, Practice, Cardiovascular disease, Women

## Introduction

Cardiovascular disease (CVD) is the leading cause of mortality not only in men but also in women worldwide despite recent advances in diagnostic and treatment regime. Heart disease is no longer a man disease per se as highlighted by initial researchers and doctors since it has been causing a vast majority of death among women as well for almost a century and more women compared to men had died of it every year since 1984.<sup>1</sup> Although there has been a decline in overall mortality for CVD, the incidence of CVD in women has been steadily increasing.<sup>2,3,4</sup> Apart from that, a lifetime CVD risk in women at the age of 40 was 1 in 3 which was almost at par with men which was 1 in 2 in developed countries.<sup>5</sup>

In Malaysia, CVD has also been the major cause of mortality since early 1970's.<sup>6,7</sup> The data from government hospitals showed that CVD death among Malaysian women in 2006 was 26.1% increasing 0.7% from 2005, which was 15.5% due to heart disease and 9.9% was due to stroke.<sup>8</sup> Currently, Malaysian women already account for about half of the country population and have achieved their life expectancy of 76.4 years, more that 16 years after they had menopause, therefore the CVD mortality and morbidity incidence are expected to increase further.<sup>9</sup>

Yet, knowledge about CVD and its risk factors still insufficient among them including those with established CHD as reported in many studies.<sup>10,11</sup> In the "Help Your Heart Stay Young" study for example, the researchers found that women's knowledge on CVD risk factors and basic lifestyle modifications were slightly lower than men.<sup>10</sup> *Oliver-McNeil et al.* also found that most of respondents could not identify their own CVD risk factors and those who were able to recognise it, reported differently from what has been documented by physician.<sup>11</sup> So the greater awareness and knowledge of gender-specific risk factors and symptoms should be enhanced in order to reduce its morbidity and mortality.

However increasing women's awareness and knowledge alone cannot lead to changes of their practice if they lack of skill and motivation. According to the behavioural model, person with a strong intention to perform (motivation), skills and availability of conducive environment, there will be a higher probability that the changes of practice will occur.<sup>12</sup> So a person with positive attitude will have greater motivation to change his or her behaviour in order to practice good things. However, in many studies, positive attitude especially regarding CVD risks was not always followed by good practice as proven in study done in Saudi Arabia.<sup>13</sup> Most respondents had positive attitude toward CVD risk factors such as smoking, high fat diet, overweight and obesity. Yet, only intention to quit smoking was found to have a relation to its practice.<sup>13</sup> In other study done among overweight UK Bangladeshi people, showed that their attitude towards exercise was good with support from their general physicians. However they would not volunteer going to the gym without referral from the physicians.<sup>14</sup>

Therefore the assessment of knowledge, attitude and practice on CVD and the association of these 3 components are considerably the most important factors in order to prevent CVD

problem since it is fatal, at 40% of all coronary events in women and 67% of all sudden deaths in women that occur in those without a history of coronary heart disease.<sup>15</sup>

Current health care service and policy in Malaysia also highlights the important of preventive measures for CVD such as adoption healthy lifestyles. Since no published local data available on the association of knowledge, attitude and practice on CVD, the aim of this study was to determine the association between knowledge and attitude, attitude and practice and knowledge of CVD and heart healthy lifestyle practice among women in Kelantan.

## **Materials and Methods**

### **Study Design and Selection of the Clinics**

This study was a cross sectional study conducted in Kelantan for the last 6 months in 2010. Kelantan is one of the rural states in Malaysia with 50% of its population (1.7 million) are women and 95% are Malays. Historically, Kelantan was the only state in Peninsula of Malaysia that was led by woman. The government had set up 56 health clinics (2011b) throughout the state that are easily accessible to the local community. About 14 of it are run by Family Medicine Specialist (FMS) at the time of the study. We choose health clinics with FMS because it serves as a reference centre to the other smaller clinics nearby and it represented the population in that area. Furthermore these clinics are equipped with good facilities for CVD screening, risk assessment and monitoring. For the purpose of this study, we have randomly chosen 7 clinics with FMS after considering the feasibility and time constraint. The first part of this study has already been published in the same journal, January this year (Volume 4, Number 1) and for further details of the design and methodology, please refer to that paper.<sup>18</sup>

### **Subjects**

A total of 448 Kelantanese women ranging from 25 to 65 years old were randomly chosen from the attendance lists of 7 selected clinics. Excluded were those who were illiterate and had active psychotic diseases. Agreeable participants were enrolled into the study after signing informed consent.

### **Methods**

They were asked to answer about KAP of CVD through self-administered questionnaires, spending 15 minutes of their waiting hour at the outpatient department.

### **Self-administered questionnaire**

The questionnaires were constructed and developed based on questionnaires used in the women health study done by American Heart Association.<sup>19</sup> We obtained the approval from Harris

Interactive, a company responsible for research for certain organization such as American Heart Association. The wording and the appropriateness of the language used were discussed with experts and supervisors. Face validity was done by Family Medicine Specialist and statistician.

A set of Malay questionnaire was divided into 4 parts.

Part I consists of demographic data, patient history of cardiovascular-related disease, family history of cardiovascular-related disease and source of knowledge.

Part II consists of 3 sub-domains (26 items) for CVD knowledge (K). The sub-domains were assessment regarding risk factors, CVD symptoms and CVD assessment levels. For the responses score of 2,1,0 was given for correct, unsure and incorrect. Reversed scoring was given for negative knowledge items. The minimum score is 0 and the maximum score is 52.

Part III consists of 17 attitude items (A) asking about help seeking behaviour and the use of preventive method. For a positive attitude item, score of 2, 1, 0 for agree, neutral, not agree respectively and this score was also reversed for the negative attitude items. The minimum score is 0 and the maximum score is 34.

Part IV consists of 3 practice sub-domains. For a good practice items, score of 0, 1, 2 for never, seldom and always respectively. The scoring was reversed for negative practice items. The minimum score is 0 and the maximum score is 24.

### **Statistical Analysis**

Data was entered and analyzed using Statistical Program for Social Sciences (PASW statistic) version 18. Data was checked and cleaned before conducting descriptive analysis to investigate the socio-demographic data. Simple linear regression was used to determine potential association between knowledge, attitude and practice and later multiple linear regression were used to confirm the association after adjusting for age, ethnic, marital status, occupation, education level, household income, medical illness and family history of medical illness. The *P* value was set at  $\leq 0.05$  as a level of significant. Model fitness was used to check the assumption that overall model fitness, equal variance assumption, normality assumption and variable functional form were satisfied and to check the outliers, to make sure there was no outlier when plotting studentized residuals against the predicted value. Later the final model of the association was done to determine the interpretations of results were valid.

## **Results**

### **Socio-demographic and CVD risk characteristics of the respondents**

The response rate was 100%. Majority of respondents were Malay (98.4%) with the mean (SD) age of respondents were 39.9 (10.04) years. Most of them had secondary education, unemployed (49.8%) and had low household income. Around 60% of them were either active or passive smoker. 41.3% had self-reporting medical illness with the commonest was obesity (23.7%),

followed by Hypertension (17.6%) and Diabetes mellitus (10.9%). Hypertension was the highest (43.1%) reported risk in the family of the respondents followed by diabetes mellitus (30%). Details can be found in Vol. 4 No. 1(January 2012) of this journal.<sup>18</sup>

### **Source of Knowledge**

From the 448 respondents majority (75.9%) had heard about cardiovascular disease which comprised of 340 respondents and the most common source of information was from more than one source which was combination of television, health care worker and relative or patient with heart disease (48.9%) as shown in figure 1. The most common multiple sources that patient acquired the information were from patient with heart disease and book/television. About 26.8% had the information from health care worker and book/television the most common (52.2%) source of information.

### **Self reported Knowledge, Attitude and Practice on cardiovascular disease**

Figure 1-3 showed the mean (SD) for CVD knowledge score, at 36.8(7.14)[70.7%(13.76)], with the percentage of good knowledge score was 55.6% ,the median (IQR) for CVD attitude score, at 30.6(5)[88.2%(14.71)] with the percentage of good attitude score was 55.1% and the mean (SD) for CVD practice score, at 15.3(3.26)[63.7%(13.59)] with the good practice score was 51.1%.

### **Association between attitude and knowledge**

Table 2 shows strong and significant ( $p < 0.001$ ) association between attitude and knowledge independent of social demographic factors, personal history and family history of CVD and the result was valid as confirmed by the final model.

The interpretation was for every one unit increase in knowledge score, there will be 0.1 increases in attitude score on CVD among women.

### **Association between practice and knowledge**

Table 3 showed strong and significant ( $p < 0.001$ ) association can also be seen between attitude and knowledge independent of social demographic factors, personal history and family history of CVD and the result was valid as confirmed by the final model.

The interpretation was for every one unit increase in knowledge score, there will be 0.1 increases in practice score on CVD among women

### Association between practice and attitude

The association between practice and attitude was also found to be strong and significant ( $p < 0.001$ ) independent to their socio demography and risk as shown in table 4. The result was found to be valid for interpretation as confirmed by the final model.

The interpretation was for every one unit increase in attitude score, there will be 0.3 increases in practice score on CVD among women.

## Discussion

### Socio-demographic characteristic and self reported risk factors for CVD

#### Socio Demographic characteristic

Most study for CVD used age cutoff point of 30.<sup>20,21</sup> However, we used 25 years based on American Heart Association that suggested CVD risk factors should be screened in early twenties since 33.5% of the US adults age 20 years and more, already had hypertension.<sup>22</sup> If the risk is identified at an earlier age, then preventative behaviors can be established to prevent the onset and prevalence of CVD. Younger adults also possess limited knowledge and awareness of CVD as proven by study done among 875 students in Michigan high schools, only 17% identified CVD as the greatest lifetime risk and merely 14% correctly identify CVD as the greatest cause of death in women<sup>23</sup>; therefore, preventative measures cannot be taken if there is not a perceived risk of developing CVD.<sup>11,24,25</sup>

For the upper limit of age, 65 years was taken as in other studies.<sup>21</sup> Furthermore beyond the age of 60 years, half of the adult American population estimated to have one or more type of CVD<sup>22</sup> and at this point, treatment approach is more appropriate than prevention approach. The mean (SD) age for this study was 39.9(10.04) years old. Although it did not cover the whole adult population but it covered the middle age women who is at the highest to get the CVD.<sup>22</sup>

Regarding ethnicity, Malays were the predominant group (98.4%) which was more than the real percentage for Malay population in Kelantan.<sup>26</sup> So the comparison between racial differences cannot be analyzed.

Majority of them (70.5%) had secondary education level meanwhile tertiary level comprised of 14.3 % which was in contrast to the local figure, Census 2000<sup>26</sup> that 3% never attended school, 42% at primary level, 53% at secondary level and 5% had tertiary level of education. The big discrepancy was due to most patient who never attained formal education, usually cannot read and write causing them not eligible to take part in the study. This will limit the real findings. They might have some form of knowledge on CVD as proven by current study and Oliver-Mc Neil and Artinian study that education level was found to be of no influence in the knowledge.<sup>11</sup> In contrast, Kurt MR *et al.* found it positively associated with CVD knowledge, self efficacy to change health behavior and motivation to reduce CVD risk and was inversely associated with perceived CVD risk.<sup>27</sup>



In terms of household income, it was based on percentage distribution households by income class, Malaysia<sup>28</sup> which was categorized into every RM 500 interval, but we simplified it into 3 categories. Comparing to the income census, nearly half of the respondents' income is below RM 1000 compared to only 7.3% showed in the census. The poverty index line in Kelantan based on the Ninth Malaysia Plan 2006-2010 is RM 675<sup>29</sup>, so for more feasibility, the income was round up to below RM1000 (approximately 320 US Dollars) as a low income. Similarly income was also found to be of no influence in knowledge in the present study as shown in other study by *Oliver-McNeil and Artinian*.<sup>11</sup>

Certain study showed that marital status influenced the CVD knowledge<sup>30</sup>, however the present study showed that there was no association between knowledge and marital status, it may be due to the majority of the respondents in this study were married (85.6%).

Self reported smoking in the present study account for 3.1% whereas passive smokers were estimated to be 53.6%. It corresponded with the prevalence study of smoking among males and females in the World Health Organization's (WHO's) Western Pacific Region (WPR) which revealed that 4% of Malaysian female was a smoker.<sup>31</sup> Apart from that the present study also showed that smoking had no influence in knowledge on CVD as shown in other study by *Tiwari R.*<sup>32</sup> The percentage of self reported passive smoker in the present study is higher than in WHO's WPR study on the prevalence in Malaysian men which was 41%.<sup>31</sup> This is quite frightening as a meta-analysis epidemiological study showed that passive smoking is associated with a small increase in the risk of coronary heart disease.<sup>33</sup> In relation to the high prevalence of cigarette smoking among men in Malaysia, it may lead to high prevalence of passive smokers especially among women and subsequently will lead to increase incidence of coronary heart disease.

Self reported obesity (23.7%), hypertension (17.6%) and DM (10.9%) in this study corresponded to our local prevalence studies which were 25.8%, 13.9% and 10.5% respectively.<sup>34,35,36</sup> However, the percentage of high cholesterol was low (1.8%). The possible reasons are hyperlipidaemia is an asymptomatic disease, that leads to delay in screening activities as reported in *Noraza et al.* that among those who did optimal CVD screening, only 73.6% did check their cholesterol levels.<sup>37</sup>

### **Source of background CVD information**

In the present study 75.9% of women reported that they had information about CVD in the past one year which was compatible to the awareness study done in the US female population which was 85%.<sup>38</sup> Nearly all respondents had access to variety of sources of information regarding CVD, within their own family, communities and in the wider atmosphere such as media or internet. Electronic and printed media (52.2%) were more common sources of knowledge than health care worker (26.8%) as the accessibility of these two sources are wider and easier.

This finding is almost similar with the study done by *Mosca et al.* in 2004 that only 24% women reported that they obtained the information from health care providers.<sup>39</sup> It may be due to

physicians have limited time during consultation and increase in workload as reported in study done among 2500 primary care physicians in US.<sup>40</sup>

### **Knowledge, Attitude and Practice on cardiovascular disease**

About half of the respondents studied in Kelantan had low education and income levels, had average knowledge, attitude and practice on CVD. Further discussion on this topic; please refer to the initial paper published in the same journal, January this year.<sup>18</sup>

### **Association between attitude and knowledge**

We found a significant association between attitude and knowledge that corresponded with the study done by Smalley et al.<sup>41</sup> This study was conducted on adolescent male (141) and female (207) assessing the attitude for obesity, smoking, high fat diet and self reported health behaviour for exercise, smoking and fast food consumer. Both studies showed the increment of knowledge will increase attitude score of the respondents toward CVD risk reduction. Thus the increment in the CVD knowledge do motivates the respondents to change their attitude positively.

### **Association between practice and knowledge**

Knowledge is an important part that promote behaviour changes and people must have adequate and correct information on CVD risk factors in order to implement preventive behaviour as found in current study and other supporting studies.<sup>42,43</sup> Jafary et al. showed there was an association between poor knowledge with lacking of preventive practice.<sup>42</sup> Similarly, the same result were found in a study done among hospital nurses that assessed knowledge and attitude about heart disease and cholesterol.<sup>43</sup> In contrast, Avis NE et al. found that knowledge does not necessarily lead to risk-reducing behavior.<sup>44</sup> Meanwhile, Oliver McNeil et al. in 2002 found that there were no relationship between knowledge risk and risk reduction behavior.<sup>11</sup> The strengths of relationship between CVD knowledge and health practice can varies depending on health practice at the study site, methodology and the questionnaires used. On the other hand, our finding from comprehensive KAP questionnaire and supporting studies concluded that in order to improve CVD prevention, we need to improve CVD knowledge in our population first.

### **Association between practice and attitude**

The present study found that there was a significant association between positive attitude toward CVD prevention and implimentation of practice on CVD risk reduction similar to the study by Robinson et al. among individuals with CVD that positive health attitude was associated with healthy behaviours.<sup>45</sup> They measured the attitude toward health using 2 questions as compared to our study which assessed the attitude with a score of multiple questions. Based on this study we



had to put more effort on improving the practice toward CVD risk reduction by conducting the healthy behaviour program at our clinic.

## **Conclusion**

It is important to recognise the relationship between a patient's knowledge, attitudes, and behaviour which are complex and needs to be taken into account when planning any strategy for preventing disease. Significant and positive associations between knowledge, attitude, practice found in this study is hope to encourage health care providers to take this challenge to educate, motivate community and provide full support to those who wish to modify their lifestyle. This data will provide the information data for the policy maker and primary care providers to make a comprehensive primary and secondary prevention programs regarding CVD prevention for women in our setting.

There are several recommendations that we can offer to improve the knowledge, attitude and practice on CVD among women in our population by the empowerment of health promotion, lifestyle modification and prevention programme on CVD among women. We should re-design our campaign to make it more interesting and meaningful than what had already been done. The awareness programme regarding CVD should be done not only at health centre but also in work place and public through campaign, seminars and health camp. Combination with motivators, educators and other resources may make CVD course or camping more practical, informative and lively. Apart from that, we have to relocate the CVD screening team to actively identify the target group for CVD risk reduction and intervention. We also can create self-screening corner in our clinic for blood pressure, blood glucose and weight (BMI) self-checking while in the waiting area. We also should encourage them to do it at home as well.

In term of the limitation of this research, this study only provided the basic data on knowledge, attitude and practice about CVD in women particularly in Kelantan and cannot be generalized to other part of Malaysia. It was conducted within a limited period of time for such a large study population to cover, which may influence or cause bias in sample selection which we tried to reduce the bias by using stratified random sampling method. Regarding questionnaire generated for this study, it did use the forced-choice method (yes, no and not sure), so a participant with no knowledge still has a 50 percent chance of getting the correct answer. There was also a possible over reporting or under reporting of their CVD risk and the reported attitude and practice regarding CVD may be not truly represent their actually believes and practice. We encourage further intervention study to be done to find out the effective methods to boost knowledge, attitude and practice on CVD lifestyle modification among women. Similar study among adolescent age group should also been carried out in order to determine their knowledge on CVD, attitude and their healthy life style practice in earlier age in order to provide early intervention.

**Competing interests:** None

### **Authors' contributions**

- a. Conception and Design : Harmy MY and Rosediani M
- b. Acquisition of Data and Analysis : Ranimah Y
- c. Interpretation of Data : Rosediani M and Ranimah Y
- d. Drafting of manuscript : Rosediani M
- e. Critical revision and final approval of completed of manuscript : Rosediani M and Ranimah Y and Harmy MY

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**Table 1: Association between attitude and knowledge on CVD**

Variable	Simple Linear Regression			Multiple Linear Regression		
	b <sup>a</sup> (95%CI)	t stat <sup>c</sup>	p-value	b <sup>b</sup> (95% CI)	t stat <sup>c</sup>	p-value
Knowledge	0.2 (0.10, 0.20)	6.03	< 0.001	0.1(0.08,0.18) <0.001	4.85	

<sup>a</sup> Crude regression coefficients<sup>b</sup> Adjusted regression coefficients after controlling for age, ethnic, marital status, occupation, education level, household income, self reported medical illness and family history of medical illnessCoefficient of determination ( $r^2$ )=0.075<sup>c</sup> t statistic**Table 2: Association between practice and knowledge on CVD**

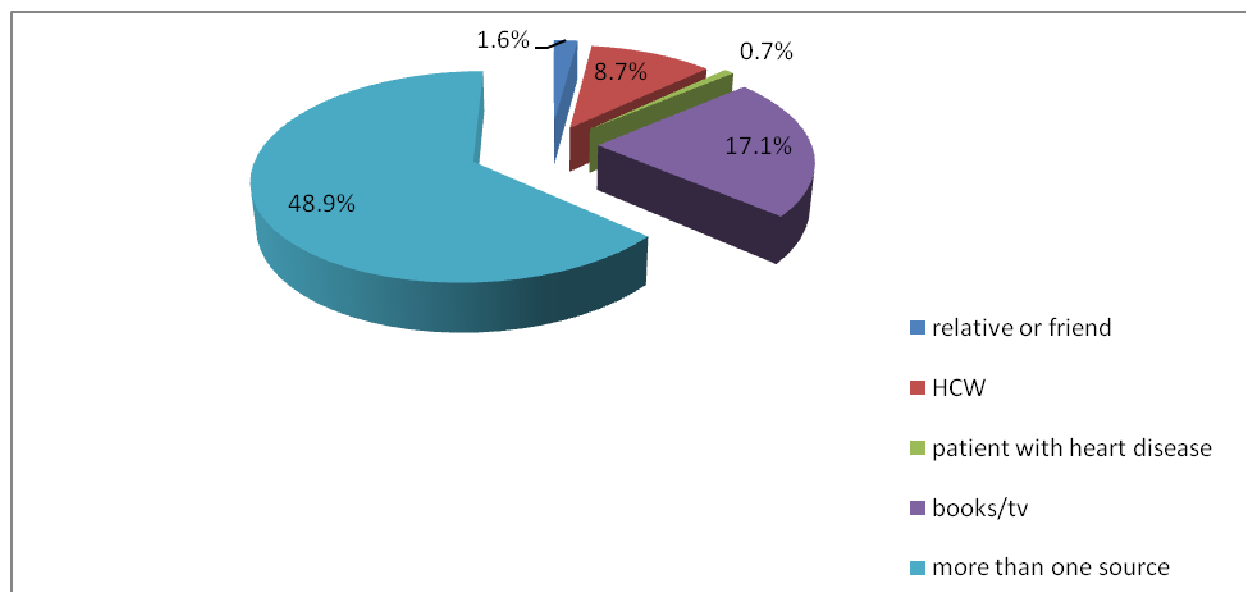
Variable	Simple Linear Regression			Multiple Linear Regression		
	b <sup>a</sup> (95%CI)	t stat <sup>c</sup>	p-value	b <sup>b</sup> (95% CI)	t stat <sup>c</sup>	p-value
knowledge	0.1(0.10, 0.18)	6.73	< 0.001	0.1(0.07,0.15) <0.001	5.34	

<sup>a</sup> Crude regression coefficients<sup>b</sup> Adjusted regression coefficients after controlling for age, ethnic, marital status, occupation, education level, household income, self reported medical illness and family history of medical illnessCoefficient of determination ( $r^2$ )=0.092<sup>c</sup> t statistic**Table 3: Association between practice and attitude on CVD**

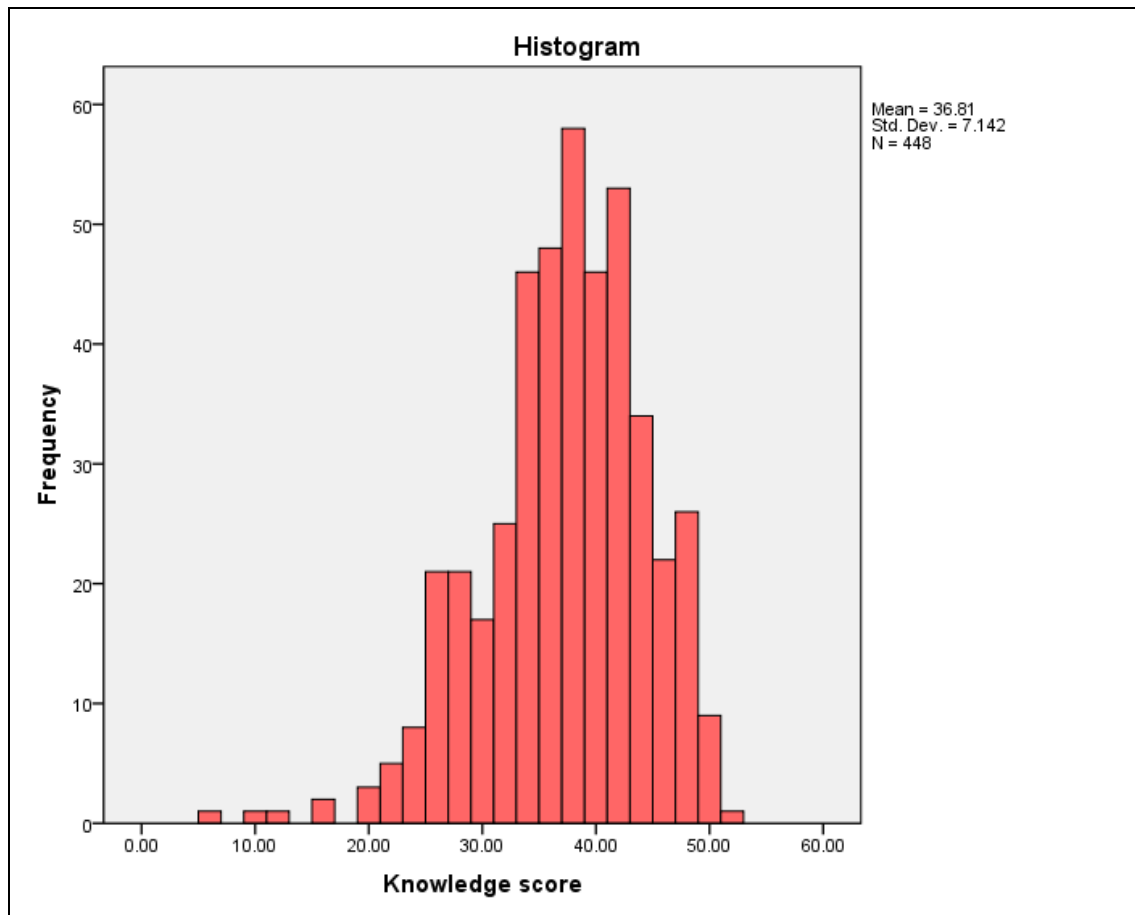
Variable	Simple Linear Regression			Multiple Linear Regression		
	b <sup>a</sup> (95%CI)	t stat <sup>c</sup>	p-value	b <sup>b</sup> (95% CI)	t stat <sup>c</sup>	p-value
Attitude	0.3 (0.26, 0.40)	9.30	<	0.3(0.20,0.34)	7.70	

0.001

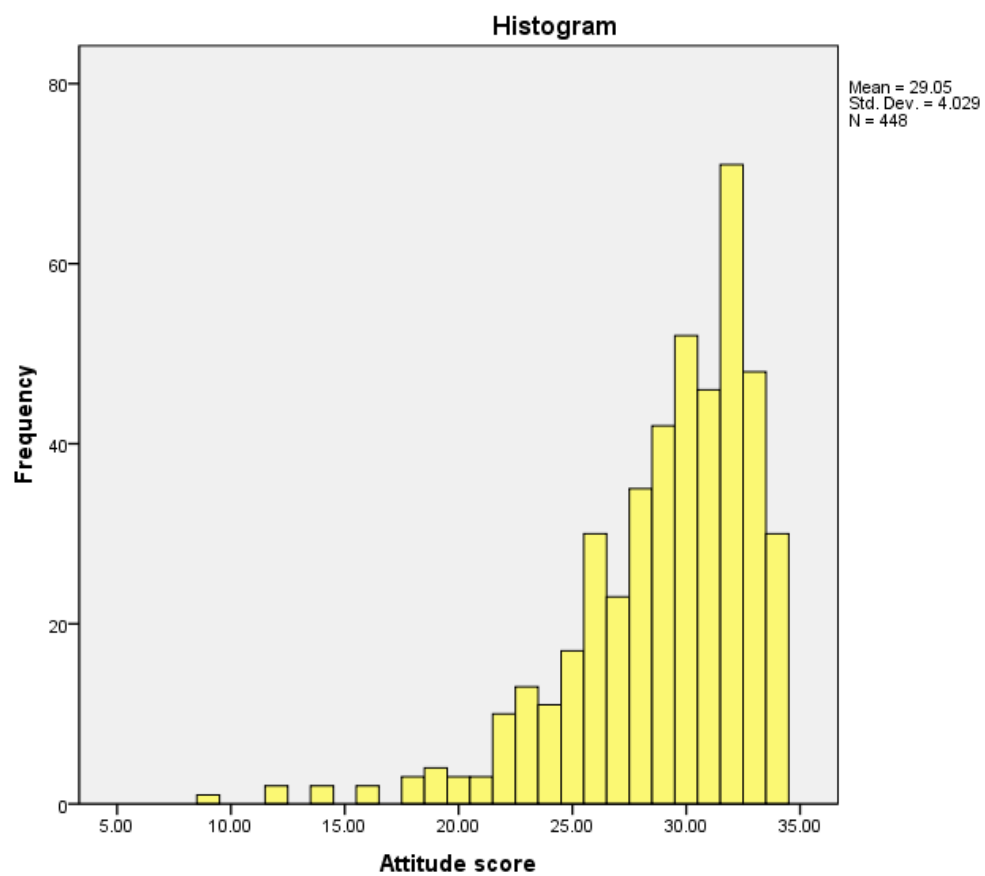
&lt;0.001

<sup>a</sup> Crude regression coefficients<sup>b</sup> Adjusted regression coefficients after controlling for age, ethnic, marital status, occupation, education level, household income, self reported medical illness and family history of medical illnessCoefficient of determination ( $r^2$ )=0.161<sup>c</sup> t statistic**Figure 1:** Percentage distribution source of knowledge

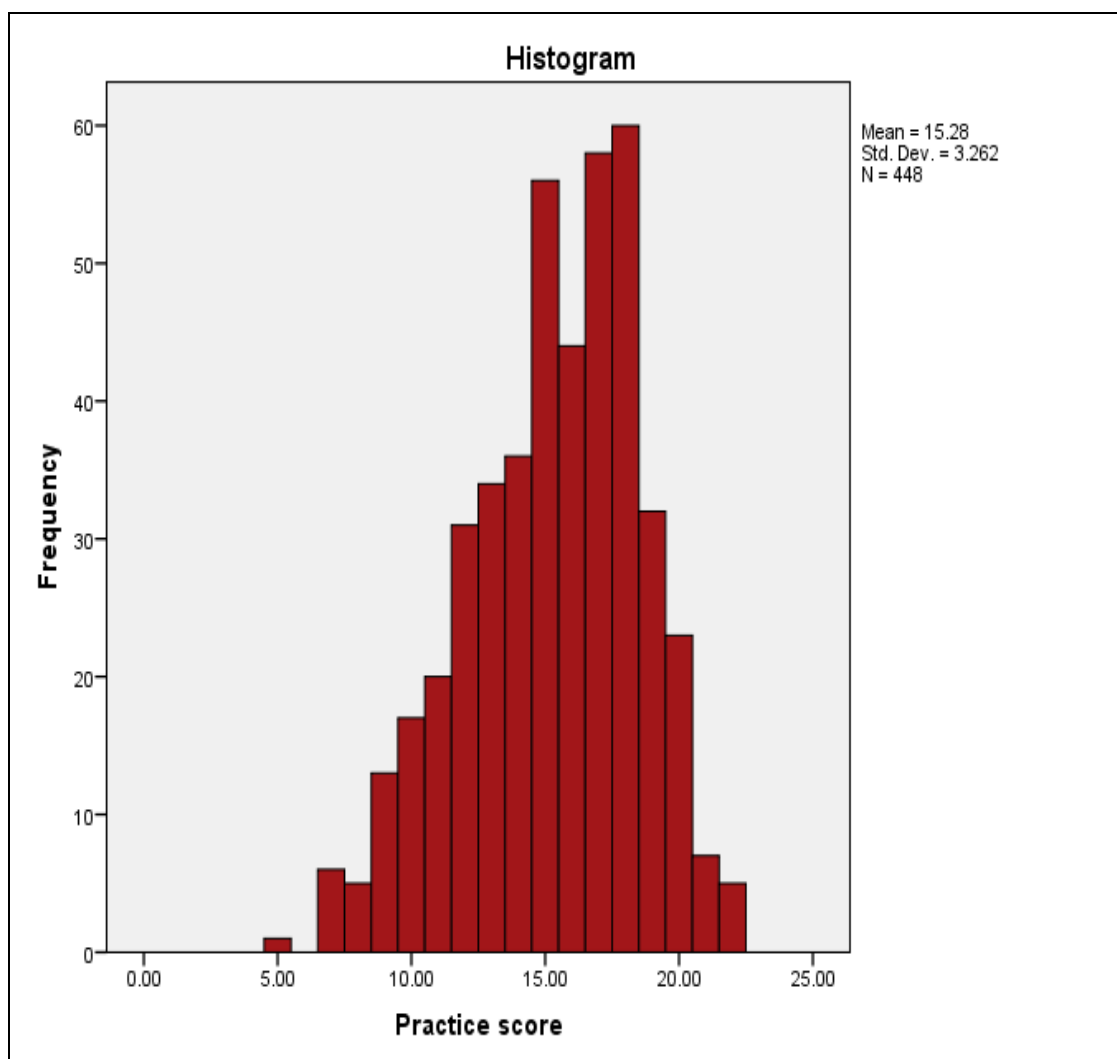




**Figure 2:** Distribution for knowledge score



**Figure 3:** Distribution for attitude score



**Figure 4:** Distribution for practice score