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Knowledge, Attitude and Practice on Cardiovascular Disease Among the Patients and Bystanders of a Multispecialty Hospital in Ernakulam District of Central Kerala, India

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Abstract: ***Kerala has seen a steep rise in the number of people affected by non-communicable diseases especially CVDs. There has also been an increase in the number of people being brought to the hospital emergency departments with acute coronary syndrome. With those facts in our minds, the research team wanted to assess the knowledge, attitude and practice on cardiovascular disease among the patients and bystanders visiting our tertiary care health centre in a rural part of Kerala. A cross sectional study was done using convenient sampling. An expert validated structured questionnaire was given to subjects after applying the exclusion criteria. A total of 354 people participated in the study with majority of males (56.5%). The questionnaire included questions regarding the knowledge regarding cardiovascular risk factors, knowledge regarding symptoms of acute coronary syndrome, attitude towards the risk factors and finally the practices carried out by them. The collected data was entered in Microsoft Excel and was analysed using SPSS version 20 software. After the analysis of the results, regarding questions related to knowledge, 77.4% subjects knew smoking is a risk factor for CVD. Most of the subjects knew that consuming fruits and vegetables regularly can prevent CVD. Regarding questions related to attitude, 65.8% agreed that regular exercise can prevent CVD. More than half of the subjects followed healthy lifestyle. There were statistically significant differences observed in knowledge level between sexes (males having a more mean knowledge score than females, p =0.001), age (age group of 20-30 having a high mean knowledge score than other age groups from 31-60, p< 0.001), education (graduates having a more mean knowledge score than those with primary and secondary education, p<0.001) and occupation (professionals having a high mean knowledge score compared to other fields of employment that we evaluated, p<0.001). More than half of the subjects were currently smoking (57.1%). This study revealed that the population had good knowledge and attitude regarding CVD risk factors. Yet, the number of smokers was still quite high. Development of better public information system is essential for the well-being of the society. Furthermore, despite having knowledge regarding certain factors, people showed less willingness to make lifestyle changes which also affected their practices. Hence, it is necessary to study KAP of the population at regular intervals to educate the people better and to aid in the planning of health promotion activities. This study proves that even though the people have good knowledge and attitude regarding CVD, the practices for prevention are not satisfactory. The researchers suggest that better health education campaigns regarding modifiable cardiovascular disease risk factors should be carried out among the public.***

Keywords: ***Cardiovascular, Disease KAP, Kerala, India, Outpatient, Risk Factors***

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I.INTRODUCTION

Cardiovascular diseases (CVDs) are common in the general population, mainly among adults [(1)]. CVD are a group of diseases which involves the heart or the blood vessels that pass through the heart. CVD includes coronary artery disease (angina and myocardial infarction), stroke, and rheumatic heart disease, congenital heart disease, deep vein thrombosis, and peripheral artery disease [(2)]. For centuries, life anticipation was often restricted by uncontrolled epidemics. But through medical research and advancements in terms of introduction of vaccinations, antibiotics and upgrading life conditions, there occurred a transformation from communicable diseases being the common cause of death to non-communicable diseases which includes CVDs.

According to a report of World Health Organisation (WHO) in 2005, cardiovascular disease caused 17.5 million (30%) of the 58 million deaths that occurred worldwide [(3)]. Based on different epidemiological studies, several non-modifiable and modifiable CVDs risk factors have been identified. Advanced age, family history, and male gender are non-modifiable risk factors. Modifiable risk factors include smoking, hypertension, diabetes, dyslipidaemia, obesity, physical inactivity, unhealthy diets, and heavy alcohol intake [(4)]. Although the CAD risk factor prevalence is the highest in the state of Kerala, India, there are no recent studies on the prevalence of CAD in this state.

The only one community-based study in 1993 from the rural area of the southernmost district of the state reported a CAD prevalence of 7.4 % [5]. The environment in Kerala is conducive for increasing the CAD risk factors [6]. Krishnan M N (2016) shows that there is an increased prevalence of CAD in young adults below 45 in Kerala [7]. This is significant as they found the prevalence of definite CAD as 0.9 % under the age of 45 years compared to none according to a 1993 study [5]. The risks of CVD can be decreased by the cessation of tobacco use, decreasing the level of salt in diet, eating more fruits and vegetables, regular exercises, and avoiding consumption of excess alcohol. The cardiovascular risk can also be reduced by preventing or treating hypertension, diabetes, and raised blood lipids. The strategy for prevention of chronic diseases is primarily grounded on the fact that the public must be educated regarding the diseases, the effect that the disease can have on the body, the slow progression and finally the potential complications. But in order to achieve a satisfactory outcome, understanding that the problem is multifactorial is crucial. The complex medical terminologies and explanations during a short visit at the clinic may not be appealing to the public. Hence the solution is a complex mix of interventions such as showing simple diagrams, conducting health education sessions, pamphlets and out-reach camps. To go for cessation activities of risk factors of CVDs, we should first find out the prevalence of these risk factors in the relevant area. In the light of these findings, the need to create awareness about CVD and its preventive factors among the population in Kerala is very important at present. The significance of the research work is to assess the prevalence of risk factors for CVDs in the community and to give awareness about the preventive measures. The benefit to the community is to reduce the burden of cardiovascular diseases, lessen the morbidity and mortality rate. The results obtained in this study could be used by other researchers for further research. By making the people aware of these risk factors, the occurrence of CVDs can be prevented to some extent.

II.SUBJECTS AND METHODS

A tertiary care hospital in a suburban area of Ernakulam district, Kerala state, South India was selected for this cross-sectional study. Ethics Committee Approval was obtained from the Institutional Review Board of the parent institution. The population that visited the hospital was selected. The subjects were selected based on the inclusion and exclusion criteria. Pregnant ladies, people above 60 years and below 20 years of age and those who were acutely ill were excluded. A structured and expert validated questionnaire that assess the knowledge, attitude and practices regarding cardiovascular disease was used for this study. The questionnaire which was prepared in Malayalam (mother tongue of the assessed population) essentially included four sections. The first section contains the demographic data such as age, gender, occupation, marital status and education. The second section included questions regarding the risk factors, perceptions, misconceptions and symptomatic presentation of an acute coronary syndrome. This segment measures the knowledge of the subject. The third section checks the subject's attitude towards food habits and exercise patterns. The fourth section has questions that check the actual lifestyle of the subject. This includes questions regarding smoking habit, eating habits especially fried food intake, time devoted to daily exercise and frequency of fruit and vegetable intake. Written consent was taken from the subjects before collecting the data. The questionnaire was evaluated in real-time with the subject present and a short discussion on the answers was done. For evaluating the knowledge of the study participant regarding symptoms of acute coronary syndrome, the "knowledge score" was used. Ten symptoms of ACS are given with options of 'yes', 'no' and 'don't know'. A response of 'yes' which is the correct answer is given 1 point. A response of 'no' and 'don't know' are wrong answers and are given 0 points. The total score of the responses is noted and classified into the following scoring system to evaluate the knowledge of the subject. Score less than 40 %: poor, 41 – 60 %: average, 61–80%: fair, more than 80%: good.

At the end of the discussion, subjects were given a leaflet with necessary information regarding modifiable risk factors of CADs. (Refer fig. 1)

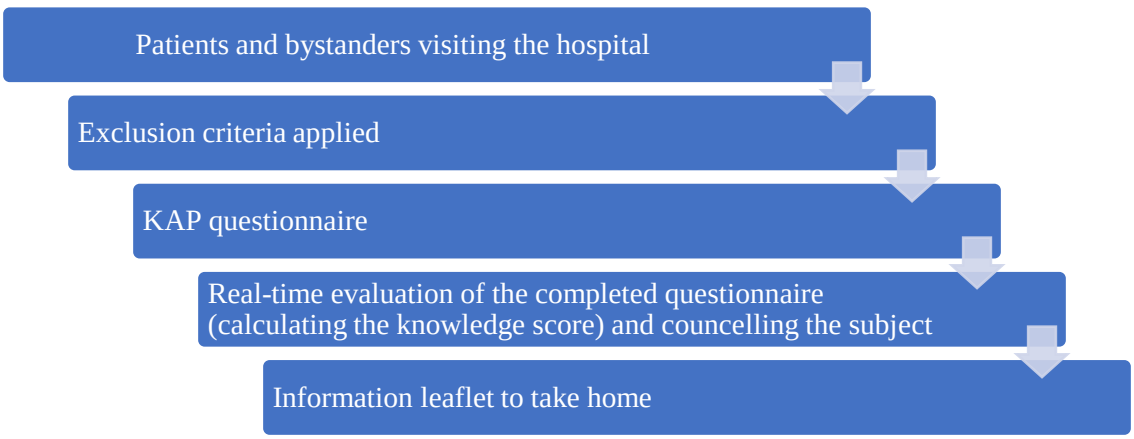

Fig 1. Flowchart showing the structure of the study.

III.RESULTS

The collected data was entered in Microsoft Excel and was analysed using SPSS version 20 software. Descriptive statistics are expressed in percentage and frequencies. Chi square test of significance is applied to test the association between various variables and p value less than 0.05 is considered statistically significant.

1. Socio-demographics:

A total of 354 people participated in the study and consisted more of males than females. Most of the people belonged to the age group of 31-40 years and majority of the study population had a secondary school education. (Refer table 1)

Table1: Socio-Demographics

Gender	n	%
Female	154	43.5
Male	200	56.5
Marital status		
Unmarried	80	22.6
Married	274	77.4
Education		
Primary	56	15.8
Secondary	170	48.0
Graduate	128	36.2
Occupation		
Unemployed	32	9.0
Homemaker	122	34.5
Skilled labourer	88	24.9
Shop/ Business	16	4.5
Professional	96	27.1
Age group		
20-30	64	18.1
31-40	112	31.6
41-50	106	29.9
51-60	72	20.3

2. Knowledge regarding cardiovascular risk factors:

The questions that scored the highest number of correct replies were “cardiovascular disease is related to heart and blood vessels” (true, n = 217, 61.3%) and “smoking is the risk factor of cardiovascular disease” (true, n = 233, 65.8%). One of the questions that scored high ‘false’ response is “high density lipoprotein (HDL) is a good type of cholesterol” (false, n = 201, 56.8%). (Refer table 2)

Table 2: Knowledge regarding CVD

Statements	True n(%)	False n(%)	Don’t Know n(%)
CVDs is related to heart and blood vessels	217 (61.3)	113 (31.9)	24 (6.8)
Most cardiovascular diseases are hereditary	153 (43.2)	160 (45.2)	41 (11.6)
CVD is the leading cause of death	202 (57.1)	80 (22.6)	72 (20.3)
CVD is the disease of woman only	96 (27.1)	210 (59.3)	48 (13.6)
CVD can occur to young people	121 (34.2)	193 (54.5)	40 (11.3)
Smoking is the risk factor for CVD	233 (65.8)	72 (20.3)	49 (13.8)
Doing housework as exercise is enough for a day	145 (41.0)	137 (38.7)	72 (20.3)
If you are slim, no need to exercise	192 (54.2)	130 (36.7)	32 (9.0)
Eating fruits and vegetables protects against CVD	169 (47.7)	128 (36.2)	57 (16.1)
Irregular eating patterns has no harm on health	177 (50.0)	161 (45.5)	16 (4.5)
High Density Lipoprotein (HDL) is a good type of cholesterol	64 (18.1)	201 (56.8)	89 (25.1)

3. Knowledge regarding symptoms of acute coronary syndrome:

Almost all the study participants recognised ‘chest pain’ to be a symptom of acute coronary syndrome (ACS) (97.7%). Other symptoms such as ‘neck pain / jaw pain’, ‘shortness of breath’, ‘light headedness / fainting’, ‘restlessness’, ‘arm pain’ were answered correctly by more than 60% of the study population. ‘Indigestion’ as a symptom of ACS was not known by 72.9 % of the study population. Similarly, 63.8 % of the population were unaware of ‘upper abdominal pain’ as a symptom. (Refer table 3)

Table 3. Knowledge regarding symptoms of ACS.

Symptoms	Yes n(%)	No, Don’t know; n (%)
Chest pain	346 (97.7)	8 (2.3)
indigestion	96 (27.1)	258 (72.9)
Neck/jaw pain	257 (72.6)	97 (27.4)
Nausea/ vomiting	168 (47.5)	186 (52.5)
Shortness of breath	240 (67.8)	114 (32.2)
Light-headedness	216 (61.0)	138 (39.0)
Unusual fatigue	192 (54.2)	162 (45.8)
restlessness	217 (61.3)	137 (38.7)
Upper abdominal pain	128 (36.2)	226 (63.8)
Arm pain	216 (61.0)	138 (39.0)

Overall, only 20.3 % people had good knowledge regarding the symptoms of ACS. (Refer fig. 2). There is statistically significant association between the knowledge score and socio-demographic factors (age, sex, education and occupation). Study subjects with high mean knowledge belongs to the age group of 20 -30 years (mean score: 8.88, SD: 0.30, p <0.001); male sex (mean score: 6.32, SD: 2.039, p=0.001); graduate (mean score: 8.13, SD: 1.057, p <0.001); professional (mean score: 8.33, SD: 0.948, p< 0.001). Study subjects with low mean knowledge belongs to the age group 41 - 50 years (mean score: 3.74, SD: 2.02, p<0.001); female sex (mean score: 5.27, SD: 2.829, p=0.001); primary education (mean score: 4.86, SD: 0.645, p< 0.001); unemployed (mean score: 4, SD: 1.760, p< 0.001). (Refer tables 4-7)

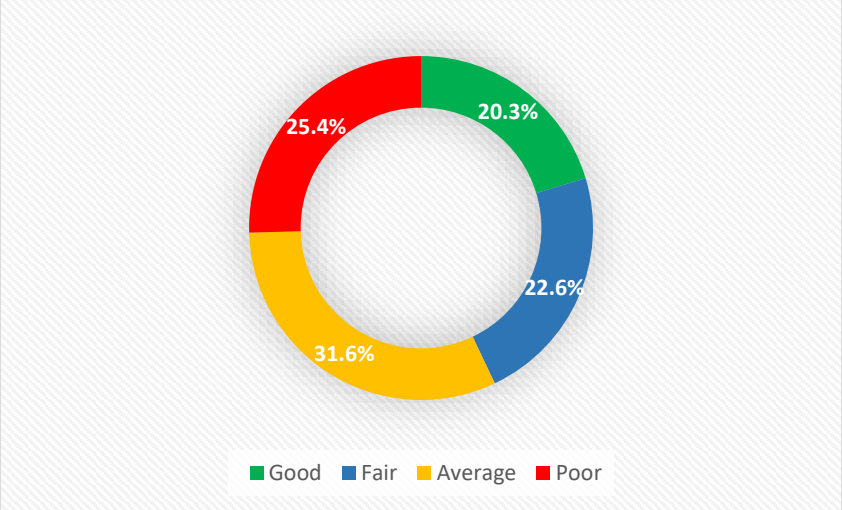

Fig. 2: Knowledge score of the study population.

Table 4: Association between education and knowledge.

Education	n	Mean	SD	Median	Minimum	Maximum	*P* value
Primary	56	4.86	0.645	5	4	6	<0.001
Secondary	170	4.49	2.374	5	1	8	
Graduate	128	8.13	1.057	9	6	9	
Total	354	5.86	2.466	6	1	9	

Table 5. Association between occupation and knowledge

Occupation	n	Mean	SD	Median	Minimum	Maximum	*p* value
Unemployed	32	4	1.76	5	1	5	<0.001
Home maker	122	4.56	2.715	4	1	9	
Skilled labourer	88	5.55	1.312	6	3	8	
Shop/ Business	16	6.5	0.516	6.5	6	7	
Professional	96	8.3	0.948	9	7	9	
Total	354	5.86	2.466	6	1	9	

Table 6. Association between age and knowledge

Age group	n	Mean	SD	Median	Minimum	Maximum	*p* value
20-30	64	8.88	0.3	9	8	9	<0.001
31-40	112	7.21	1.02	7	6	9	
41-50	106	3.74	2.02	4	1	7	
51-60	72	4.22	1.41	5	1	6	
Total	354	5.86	2.47	6	1	9	

Table 7: Association between sex and knowledge

Sex	n	Mean	SD	Median	Minimum	Maximum	*p* value
Female	154	5.27	2.829	6	1	9	0.001
Male	200	6.32	2.039	6	1	9	
Total	354	5.86	2.466	6	1	9	

4. Attitude regarding cardiovascular disease risk factors:

More than 50% of the people strongly agreed that 'smoking is bad for health' (54.8%). Many voted 'uncertain' to questions like 'controlling stress can avoid to getting any disease' (50.3%), 'I can manage my stress' (48%), 'sometime eating super late at night is good' (45.2%), and 'prefer to play with laptop instead of doing exercise' (36.2%). Overall, the study population's attitude towards preventing the risk factors of CVD is satisfactory. (Refer table 8)

Table 8: Attitude regarding cardiovascular disease risk factors

Statements	SD n(%)	D n(%)	U n(%)	A n(%)	SA n(%)
Smoking is bad for health	24 (6.8)	40 (11.3)	16 (4.5)	80 (22.6)	194 (54.8)
Exercise regularly to maintain health	16 (4.5)	48 (13.6)	57 (16.1)	64 (18.1)	169 (47.7)
Controlling stress can avoid getting disease	24 (6.8)	24 (6.8)	178 (50.3)	48 (13.6)	80 (22.6)
Walking can benefit health	32 (9.0)	64 (18.1)	48 (13.6)	64 (18.1)	146 (41.2)
Avoid carbonated soft drinks	40 (11.3)	32 (9.0)	40 (11.3)	168 (47.5)	74 (20.9)
I can manage my stress	64 (18.1)	32 (9.0)	170 (48.0)	32 (9.0)	56 (15.8)
Less oily food is good for health	32 (9.0)	56 (15.8)	42 (11.9)	168 (47.5)	56 (15.8)
Fruits and vegetables are good for health	56 (15.8)	32 (9.0)	26 (7.3)	104 (29.4)	136 (38.4)
Eating very late at night is good for health	32 (9.0)	24 (6.8)	160 (45.2)	88 (24.9)	50 (14.1)
Prefer to use laptop/ mobile than exercise	40 (11.3)	32 (9.0)	128 (36.2)	88 (24.9)	66 (18.6)

SD: Strongly Disagree, D: Disagree, U: Uncertain, A: Agree, SA: Strongly Agree

5. Practices regarding cardiovascular disease risk factors.

In this study, 15.8 % walks every day for 10 minutes and only 9 % does exercise for at least 20 minutes. 52.3 % people frequently eat snacks in between meals. Meanwhile, 4.3 and 2.5 percent of the population never includes fruits and vegetables respectively in their diet. Majority of the respondents had poor practices towards risk factors of cardiovascular diseases. (Refer table 9)

Table 9: Practices regarding cardiovascular disease risk factors.

Statements	Always n(%)	Frequently n(%)	Seldom n(%)	Never n(%)
How often do you smoke?	88 (24.9)	42 (11.9)	72 (20.3)	152 (42.9)
Do you spend your leisure time to exercise at least 20 minutes	32 (9.0)	80 (22.6)	80 (22.6)	162 (45.8)
Do you walk for 10 minutes daily?	56 (15.8)	48 (13.6)	170 (48.0)	80 (22.6)
Does your daily activities include vigorous activity?	48 (13.6)	49 (13.8)	32 (9.0)	225 (63.6)
How often do you take fruits in your diet?	80 (22.6)	185 (52.3)	73 (20.6)	16 (4.5)
How often do you take vegetables in your diet?	249 (70.3)	64 (18.1)	33 (9.3)	8 (2.3)
How often do you eat fast food?	81 (22.9)	32 (9.0)	176 (49.7)	65 (18.4)
Do you like to eat in between main meals? (snaking)	72 (20.3)	185 (52.3)	49 (13.8)	48 (13.6)
Do you eat fried foods as your main course?	64 (18.1)	72 (20.3)	186 (52.5)	32 (9.0)
How often do you feel stressful?	89 (25.1)	97 (27.4)	88 (24.9)	80 (22.6)

IV.DISCUSSION

Non-communicable diseases (NCDs) result in two thirds of deaths worldwide. They are a cause of chronic disability [8] and are a major health and economic concern. In India, cardiovascular disease is currently the leading cause of mortality and is responsible for 28 % of all deaths [9]. There is presently very limited data available about the knowledge, attitude and practice of the rural population in the state of Kerala, India regarding cardiovascular diseases.

Our study population included more males than females. This is probably due to the fact that in Indian rural areas, males usually accompany patients to the hospital. Also since this is a rural area, almost half of the population has a secondary school education (48%). Education has a deep impact on the level of knowledge a person has about cardiovascular diseases. Of the 43.5 % of females who participated in the study, 34.5 % mentioned that they are home makers. Rest of the 9 % females were professionals. Also, roughly a quarter of the population are doing small scale businesses like shops. Almost all of the study population were able to answer all the questions in the questionnaire. No questions were omitted. It was also found that men have a better knowledge score than women. Men scored 6.32 while women scored 5.27. This finding directly correlates with the high literacy rate among males in Kerala. Association of good knowledge with male gender and higher educational status was also reported in the study done by Mirza et al. in Bangladesh [10]. Literacy rate in Kerala has seen upward trend and is at 94.00 percent as per 2011 population census. Of that, male literacy stands at 96.11% while female literacy is at 92.07 % [11]. Study population has a good level of knowledge about cardiovascular diseases. Majority have perfectly identified smoking as a risk factor and answered doing exercise and including fruits and vegetables in the diet will prevent cardiovascular diseases. This finding is consistent with another study done in Malaysia which reports that 87.1% of the study population thinks that smoking is a risk factor for CVD [12]. Since the study took place in a hospital, most of the people visiting may be aware of the common health conditions. Also, due to the widespread social media usage, coupled with the very high literacy rate in the state, our study population expressed high level of knowledge.

Poor knowledge about CVD in this study is about High-Density Lipoprotein (HDL). Only 18.1% people correctly answered the question. More than half (56.8%) thought that HDL is bad and 25.1% answered “don’t know”. Most of the subjects agreed that they have heard about “good” and “bad” cholesterol beforehand. But they were unable to distinguish the medical terms while filling out the questionnaire. The attitude of the study population was satisfactory. 77.4% agreed on “smoking is bad for health”. This finding is consistent with a study conducted in rural Kerala, in which 70% of the participants had a positive attitude pertaining to this issue [13]. This finding gives hope that people have an understanding regarding the risk of the habit of smoking. Smoking is the leading cause of CVD and a lot of other diseases in the world. 39% people agrees that “eating super-late at night is good”; which is alarming.

Modernization and industrialisation have led the way for opening fast-food chains and 24-hour shops. People eating late at night will usually consume their food in one of these shops. These fast-food shops serve food rich in trans fats [14]. This trans fats can greatly reduce the level of HDL in the body, thus creating another risk factor for the development of CVD. 68.4% agreed on avoiding carbonated soft drinks. This is also a good sign. The carbonated drinks which are widely available, are having very high content of sugar in them and consuming them will lead to the obesity epidemic. Nevertheless, attitude toward vegetables and fruits intake among the subjects is highly positive. Most of the study participants consumed fruits and vegetables daily as a part of their diet. However, other preventive practices were not frequently carried out, which indicated that the participant's behavioural activities to prevent CVD were not optimal. It is worth notice that 45.8% of people were not doing exercise for at least 20 minutes. Furthermore, the number of subjects that took fast food everyday was quite low. However, most of the subjects were having fried food almost every day. This is highly related to the eating habits of people in south India. Oily food is not good for health as it can increase the bad cholesterol level in the body. Moreover, it can also cause accumulation of fat in the body and will lead to obesity if coupled with physical inactivity. Most of the people (77.4%) agreed that smoking is a risk factor. The similar finding was uncovered on a study conducted on 110 individuals in the rural areas of Lahore, Pakistan in 2018 [15]. On analysing the data, 57.1% of our study population was currently smoking. Even though people were aware that smoking causes health problems, they continued to smoke. This shows that a strong smoking cessation campaign must be carried out in the community to raise awareness.

V.CONCLUSION

Prevention of CVD risk factors in the community is extremely important. The study population showed a good level of knowledge and a satisfactory attitude regarding the risk factors of cardiovascular diseases and their prevention. But the practices of the subjects regarding this matter were not optimal. There is significant association between knowledge regarding CVD risk factors with age, sex, education and occupation. This study proves that the current smoking cessation campaigns are not making a difference. More effective plan should be implemented to curb the use of tobacco within the community.

LIMITATIONS

India is very diverse in a variety of parameters including socioeconomic strata, cultural and dietary habits, extent of education, and ethnicity, and therefore, it is difficult to make generalisations based on results from a rural area.

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1. Andrew Spiro, Aqueel Usman, Asif Ajmal, Thanh D. Hoang, Mohamed K. M. Shakir, "Asymptoma)c and Biochemically Silent Pheochromocytoma with Characteris)c Findings on Imaging", Case Reports in Endocrinology, vol. 2020, Article ID 8847261, 4 pages, 2020. https://doi.org/10.1155/2020/8847261
2. Ameer Khan, A.A., Thomas, A., Karothukuzhy Kunjumohamed, N.M., Jayaprakash,V.P., & Du[, J.. A study on es)ma)ng the Cardio Vascular Disease risk among medical students in central Kerala; The INTERHEART method.. Journal of Clinical and PrevenYve Cardiology. 2018, Volume 7, Pages 144-7

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1. Mohamed K.M. Shakir, MD, ***Nesrin Mohamed, MD***, Nicole Vietor, MD, Vinh Q. Mai, DO, Thanh Duc Hoang, DO, Walter Reed National Military Medical Center, Bethesda, MD, USA. ; ***Acute Cadiovascular Complications From Testosterone Therapy****; Published in ENDO 2019 Web Program, Session P32- Male Reproduction: From Bench to Bedside.* Journal of the Endocrine Society (JES).
2. Ameer Khan, A.A., Thomas, A., ***Karothukuzhy Kunjumohamed, N.M.***, Jayaprakash,V.P., & Dutt, J.. ***A study on estimating the Cardio Vascular Disease risk among medical students in central Kerala****; The INTERHEART method.* Journal of Clinical and Preventive Cardiology. 2018, Volume 7, Pages 144-7

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