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Predominance of customary risk factors in myocardial infarction patients of different age groups at tertiary health care hospital, Lahore, Pakistan

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Abstract

Cardiovascular disease (CVD) and its risk factors are growing problem in developing countries. CVD are the main cause of death in most countries and there is global increase during last two decades. This study was aimed to evaluate the relationship between major risk factors of myocardial infarction (MI) and subjects of different age groups GI (31-40 years), GII (41-50 years), GIII (51-60 years), GIV (61-70 years), GV (71-80 years) admitted at Punjab Institute of Cardiology Lahore, Pakistan. Data were collected from MI subjects by using a demographic questionnaire from 2019-2020 and epidemiological patterns were analyzed. From data analysis, various age groups of MI subjects showed association with risk factors like diabetes, hypertension, smoking, family history and life style. Overall association between age and risk factors was 20%. In case of Diabetes as risk factor, subjects of G IV showed maximum odd ratio > 1 i.e. 1.25, while in hypertension GV showed odd ratio is > 1 i.e. 1.37. Other risk factors like smoking, family history and life style of GIII had odd ratio > 1, i.e. 1.85, 1.4 and 1.30 respectively. This study concluded that among the MI subjects irrespective of gender major risk factors like diabetes, hypertension, smoking, family history and life style is correlated to different age groups. Thus control over these risk factors can play a vital role for the prevention of myocardial infarction. The increasing prevalence and that of major risk factors, especially the increase in prevalence of MI in under developed districts of Punjab Pakistan, there is need for urgent policy and health system to control and response appropriate for the situation.

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Introduction

Cardiovascular diseases (CVD) are the leading cause of disease burden and deaths. It globally accounted for 17.9 million deaths in 2015; with the number of attributed deaths increasing from 12.3 million in the year 1990 to more than 17.6 million in 2016. Metabolic risk factors, such as elevated cholesterol levels, type 2 diabetes mellitus (henceforth diabetes), and hypertension are the most prevalent and unequally distributed across populations (Lara *et al.,* 2018).

Furthermore the factors like smoking; suboptimal diet and abuse of alcohol are also major risk factors for cardiovascular diseases (Kira *et al.,* 2019; Vasan *et al.,* 2005). The development of CVD mainly depends upon (75-90%) the presence or absence of these traditional risk factors (Ravi *et al.,* 2011). Age is a recognized and considered to be a traditional risk factor. There is an incremental acquisition of various CVD risk factors with aging in an individual's lifespan. To assess individual's risk of CVD, there are several risk prediction scores but all of these contain "age" as a predictor. These risk scores assessed that older age is associated with greater risk of CVD (Petrie *et al.,* 2018).

Diabetes being a comorbid of CVD is major cause of mortality and morbidity often aggravated by hypertension. Accordingly, hypertension and diabetes are closely interlinked due to similar risk factors, such as vascular inflammation, endothelial dysfunction, obesity, arterial remodeling, atherosclerosis and dyslipidemia (Spencer *et al.,* 2008). It is also well known risk factor for ischemic stroke and coronary heart disease (Schramm *et al.,* 2008) but its effectiveness varies by sex, age or levels of conventional risk factors is uncertain (Lancet *et al.,* 2010; Valerio *et al.,* 2016). In most of CVD cases with stroke and myocardial infarction, hypertension is considered the most significant risk factor (John *et al.,* 2018).

Hypertension is an important worldwide health challenge due to its high prevalence and contribution in cardiovascular and chronic kidney disease (Bauman *et al.,* 2017; Young *et al.,* 2016; Stamatakis *et al.,* 2019). Globally hypertension is major preventable risk factor for disability and premature death. In 2000 it has been estimated globally that 26.4% or 972 adult populations had hypertension. National reports showed that since 2000 the prevalence of hypertension is steady or decreasing in high-income countries but increasing in low- and middle-income countries (Ekelund *et al.,* 2016; Grundy *et al.,* 1999; Ralston *et al.,* 2016). Hypertension has constant, age linked risk of mortality from ischemic heart disease. In developed countries 30% of adults have history of hyper tension. There is an independent association between hypertension and adverse cardiac outcome after acute myocardial infarction (MI) (Yusuf *et al.,* 2014). Modern data from National Health and Nutrition Examination Survey showed that only 32% of adults aged 40-59 years have hypertension, compared to 70% for older adults (Clark, 2013).

From south Asian countries including Sri Lanka the available information is limited and unorganized. This described CVD to be an increasing epidemic while deaths have been increased 66% in low and middle income countries since 1990.during past two decades CVD was increased globally and hypertension being major risk factor renal failure, stroke, coronary artery disease and heart failure (WHO, 2013).

Globally there is a continuous rise in prevalence of Type 2 diabetes and obesity due to lifestyles that is linked with high caloric intake and low energy expenditure, especially in developing and lowers income countries. It has been estimated that by 2040 the probability of T2D increase will be 415 to 642 million. Hypertension and T2D are easy to diagnose yet they are complex and heterogeneous phenotypes linked with an increased risk of life threatening cardiovascular disease. Their recurrent coexistence in the same individual is not a coincidence, as the pathophysiology of both conditions is shared, mainly those related to obesity and insulin resistance (Lancet, 2018).

Physical activity has well-known protective effects on health, and its potential benefits extent across the prevention, treatment and management of cardiovascular disease (CVD) (Yusuf *et al.,* 2004).

Sedentary behavior (SB) shows the lowest end of the physical activity spectrum and generally defined as a low energy expenditure of <1.5 metabolic equivalents (MET) in a reclining posture or sitting during waking hours (Rawshani *et al.,* 2018). Analysis of large population data has shown the combined association of sitting and physical activity (Murabito *et al.,* 2005). By increasing the physical activity the association between sitting and all cause CVD mortality was gradually decreased. The CVD mortality can be nullified with per day equivalent to >60 to 75 minutes moderate-intensity physical activity (Steven *et al.,* 2001). Internationally 80 percent cardiovascular infection was found in low-wage and center wage nations while the data about coronary illness hazard factors were observed in created nations. CVD was more compelling on low and center pay nations than high wage nations, while their social example is relatively lesser known (Lloyd-Jones *et al.,* 2004). The increasing burden of non-communicable diseases (NCDs) and high disease severity has alarmed UN, in middle income and low income countries as compare to high income countries (Ogurtsovaa *et al.,* 2017; Kearney *et al.,* 2005; Lawes *et al.,* 2008). WHO developed goals for prevention and control of NCDs in 2013, which had 25% relative decrease in prevalence of high blood pressure, 25% relative decrease in overall mortality from cardiovascular diseases, halting the increase in obesity and diabetes to assure the access of relevant drugs and medical counseling to 50% of CVD patients by 2025 (GBD, 2013; Devi *et al.,* 2013; Egan *et al.,* 2010). Pakistan is among developing country where people are facing poor health conditions as well as low socio economic status. CVD prevalence is rising throughout Pakistan due to multiple unexplained risk factors. Therefore the current study was conducted with an aim to identify the potential risk factors effecting myocardial infarction patients of different age groups admitted in hospitals.

Materials and methods

For data collection, a demographic Performa was designed comprised of possible risk factors. The data was collected from pre diagnosed Myocardial infarction patients admitted in Punjab institute of Cardiology Lahore Pakistan, after taking written consent.

Assessment of conventional risk factors of MI (smoking, blood pressure, diabetes, family history and lifestyle) on different age groups. The aim is to describe relative association of these MI hazard factors to various age groups.

Blood Sampling

A survey based study was conducted for the collection of Data from a tertiary level hospital of Lahore. The present study was ethically approved by Advanced Board of Studies University of the Punjab Lahore. For data collection, a demographic Performa was designed comprised of possible risk factors. The data was collected from pre diagnosed Myocardial infarction patients admitted in Punjab institute of Cardiology Lahore Pakistan, after taking written consent.

Study Population

The target population of study was People from different areas of Punjab. The study was conducted on subjects hospitalized with MI and associated risk factors. These subjects were grouped age wise as: 31-40, 41-50, 51-60, 61-70, 71-80.

MI Risk Factors	
Diabetes	The current WHO diagnostic criteria for diabetes should be maintained. Fasting plasma glucose ≥ 7.0mmol/l (126mg/dl) or 2-h plasma glucose ≥ 11.1mmol/l (200mg/dl) (WHO 2006).
Hypertension	When systolic blood pressure is equal to or above 140 mm Hg and/or a diastolic blood pressure equal to or above 90 mm Hg the blood pressure is considered to be raised or high while low blood pressure is less than 90/60 (WHO, 2015).
Smoking	Smoker is someone who smokes any tobacco product, either daily or occasionally. Daily smoker is someone who smokes any tobacco product at least once a day (WHO, 2008).

Family history	A family medical history defined by NIH is a record of health information about a person and his or her close relatives.
Life style	According to the WHO definition (1998), a healthy lifestyle is based on the defined patterns of behavior determined through a person's interactions among individual characteristics, social interactions, and economic and environmental conditions.

Inclusion and Exclusion criteria

Subjects were selected with age ranging from 20-80 years and having clinical symptoms of MI such as suffering from Pressure or tightness in the chest, pain in the chest back, jaws and areas of upper body that lasts for few minutes. In case of diabetics there was random and fasting sugar check. Furthermore Subjects with age less than 20 years, pregnant females and mothers who feed infants were excluded.

Ethical Considerations

All data collection was done precisely; patients signed the consent form as they were briefed about the objectives of study and its implementation. Moreover, all data collected was stored in a manner that ensured no breach of participants' privacy

Statistical Analyses

After collecting data was tabulated and statistical analysis was performed. The most frequent statistical techniques in categorized data analysis were the chi square test.

The Pearson chi square Ho= $X^2 \sum$

Pearson chi square test was applied at 5% level of significance. In order to evaluate the strength of association Phi/cramer V value and coefficient of contingency was computed.

Results

It was observed that different age groups were differently associated with different risk factors. The strength of association was 0.20 which showed that there was 20% association between the age and risk factors (Table 1).

Individuals with age group 61-70 years with diabetes as a major risk factor for myocardial infarction with maximum odd ratio >1 i. e 1.25, While age group 30-40 was found as second major group at risk of diabetes.

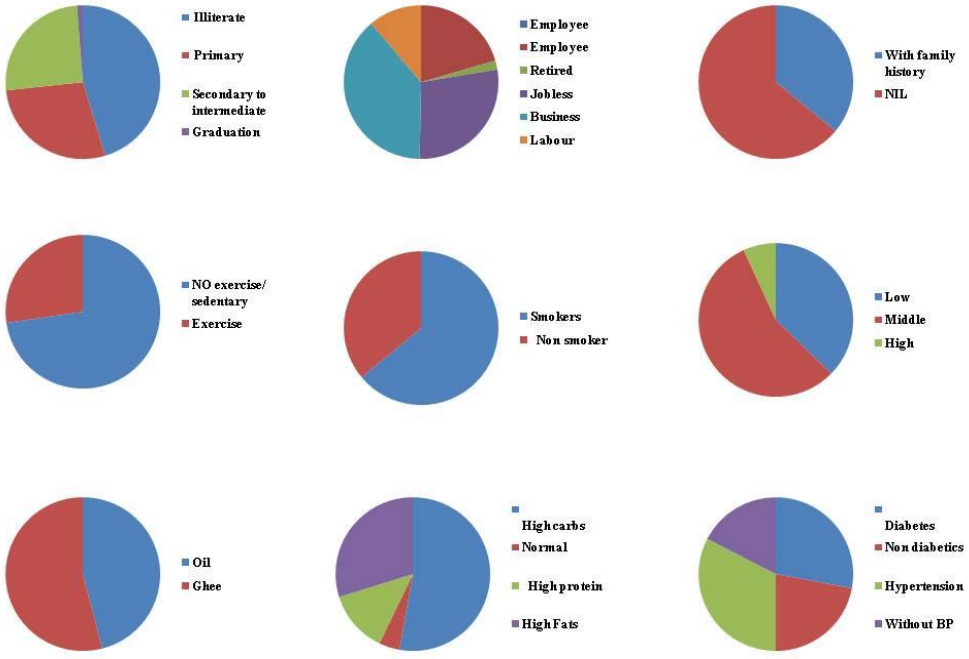

Fig. 1. Questionnaire study

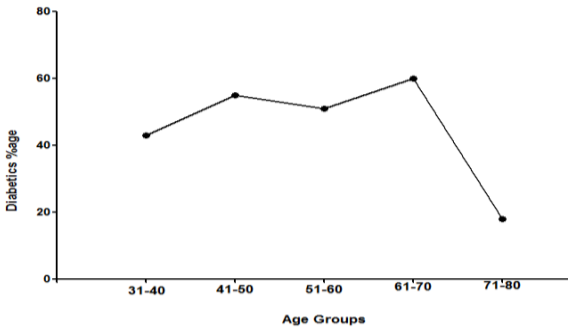

Fig. 1. Percentage of diabetics as MI risk factor at different age groups.

Hypertension (Fig. 1) was found more prevalent in the age group of 71-80, it is three times more prevalent with odd ratio is >1 i.e 1.37. Second age group 61-70 years was 1.8 times more likely to occur than other age groups.

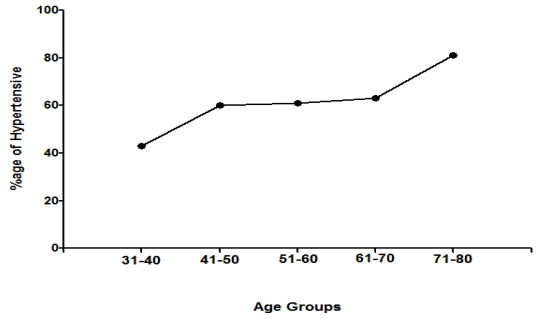

Fig. 2. Percentage of Hypertension as MI risk factor at different age groups.

Smoking as risk factor for MI showed most likelihood in the age group 51-60 having odd ratio >1, i.e 1.85. In other age groups 31-40, 61-70 and 71-80 smoking was found significant. Similar result was shown in fig. 3 by using the percentage of smoking as risk factor in different age groups.

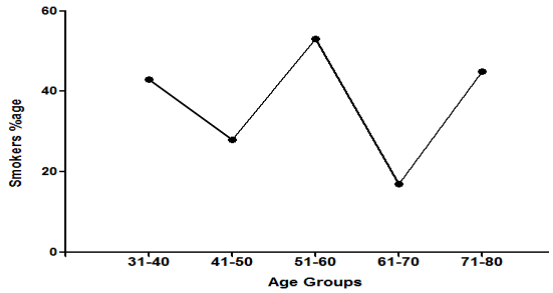

Fig 3. Percentage of Smoking as MI risk factor at different age groups.

Family history showed its maximum probability as risk factor in the age group of 51-60 years with odd ratio is >1 i. e 1.4. Also the age group 40-50 had significant result. Graphical representation of family history as risk factor in fig. 4 by using percentage data showed 41-50 age groups most preferred.

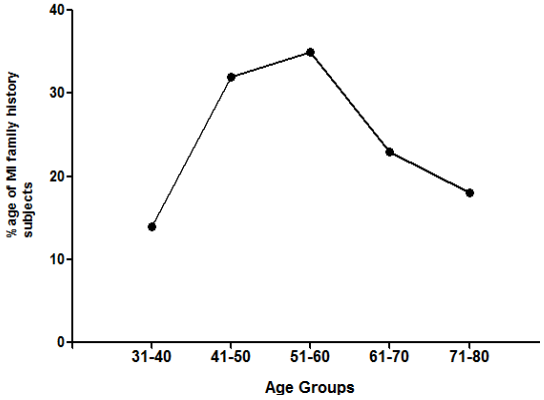

Fig. 4. Percentage of family history as MI risk factor at different age groups.

Life style found most significant risk factor in the age group of 51-60 years with odd ratio is >1 i.e 1.30. This risk factor was significant in the age group of 61-70 years. Percentage data in fig. 5 this risk factor showed the most likelihood in the age group 51-60.

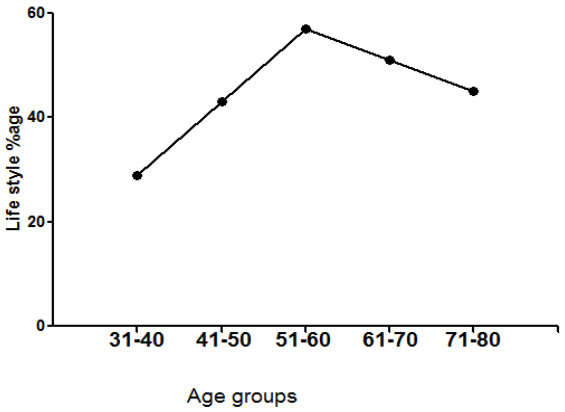

Fig. 5. Percentage of life style as MI risk factor at different age groups.

Fig. 6 represents MI percentage in different age groups showed that individuals in the age group 51-60 are more at risk of Myocardial infarction.

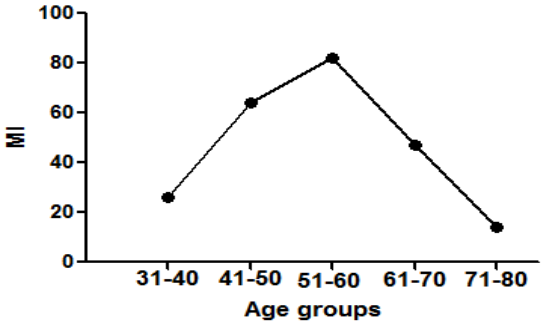

Fig 6. MI subject's percentage in different Age groups.

Table 1. Chi square tests of Myocardial infarction risk factors and different Age groups.

	Value	df	Significant (2-sided)
Pearson Chi square	27.840	16	0.03
Phi	0.204	----	----
Cramer's V	0.102	----	----
Contingency coefficient	0.20	----	----
No. of valid cases	365	----	----

Discussion

To our knowledge, this is the first epidemiological-analysis of various risk factors in myocardial infarction patients of different age groups. Naturally age is an independent risk factor for developing CVD, then with the increase in age of individual there will be an increase of lifetime risk for CVD. From recent data analysis it is observed that age group 50-60 years is a critical age bracket to be effected by possible risk factors. In older age, the role of age to cardiovascular disease risk decline due to shorter time left for individual to attain other modifiable CVD risk factors. Thus age influences the evaluation of both short and long-term CVD risk of an individual (Lloyd-Jones *et al.,* 2004). Increasing age is an independent risk factor for CVD. However with increasing age burden of CVD risk can be reduced partly by the modification of traditionally coexisting CVD risk factors. It was demonstrated that diabetes is a significant risk factor in onset of CVD and it is reported that diabetes increased the chances of the CVD development i-e., 'Diabetes is a cardiovascular disease'. Another study reported that diabetes or impaired glucose tolerance (79%) and dyslipidemia (71%) are the major risk factor for Coronary artery disease (Cífkova *et al.,* 2010).

According to the findings if diabetic people with five risk factors within the target range, there is slight risk of death and myocardial infarction in comparison to the general population (David *et al.,* 2018). The strongest predictors about risk of myocardial infarction were systolic blood pressure, glycated hemoglobin level, cholesterol level, LDL, smoking and physical activity. There is a linear association between these risk factors and risk of acute myocardial infarction (David *et al.,* 2018). Studies described that by decreasing the systolic blood pressure the risk of cardiovascular out comes and death is lowered (Buford, 2016). Systolic Blood Pressure Intervention Trial (SPRINT) observed that in patients without diabetes and systolic blood-pressure targets below guideline levels, risk of cardiovascular outcomes and death is decreased. Current study demonstrated that, hypertension and smoking in older age were also key factors of CVD onset. In contrast to current findings, study conducted in Indian population reported that hypertension (39%) and cigarette smoking (24%) were not seen to be a major risk factors for coronary artery disease as only a minority of the study population had hypertension or gives a history of cigarette smoking (Cífkova *et al.,* 2010).

Positive family history of CVD is also found an important risk factor in the onset of disease while positive paternal family history was reported as a significant risk factor in onset of disease in middle aged offspring's (Katherine *et al.,* 2016). It also shows a genetic background responsible for CVD. The association between family history and CVD with the adjustment of environmental confounder, genetic background seems to be responsible for the increased CVD risk (John *et al.,* 2018). Among the least physically active adults sitting is associated with CVD mortality risk but this association can be effectively eliminated by Moderate-to-vigorous physical activities. Stratified analysis on physical activity and mortality risk concluded that higher the physical activity there will be lesser chance of CVD and all-cause mortality (ACM) (Stevens *et al.,* 2001).

Current study demonstrated that, hypertension and smoking in older age were also key factors of CVD onset.

In contrast to current findings, study conducted in Indian population reported that in case of coronary artery disease hypertension (39%) and cigarette smoking (24%) did not contribute as major risk factor (Cífkova *et al.,* 2010). Similar to current findings another study reported that smoking and abnormal are important cardiovascular risk factors. Correspondingly potential targets declared by studies are diabetes mellitus, hypertension, smoking; family history and life style (Katherine *et al.,* 2016).

Conclusion

Our findings have important clinical and public health implications as cardiovascular diseases still is the leading cause of death worldwide. This study showed that diabetes, Hypertension, smoking, positive family history of CVD and poor socio economic status are significant risk factors of CVD development among Pakistani population. However large population survey needed for determination of further risk factors of disease. The current conclusion consequently provides further support for policies and interventions to prevent people from various risk factors of cardiovascular diseases.

References

Bauman A, Alharbi M, Lowres N, Gallagher R, Stamatakis E, Vasan RSD. 2017. Exercise, physical activity, and cardiovascular disease. The Encyclopedia of Cardiovascular Research and Medicine. Elsevier Oxford 274-280.

Buford TW. 2016. Hypertension and Aging. Ageing Res Rev **26,** 96-111.

Cífkova R, Skodová Z, Bruthans J. 2010. Longitudinal trends in cardiovascular mortality and blood pressure levels, prevalence, awareness, treatment, and control of hypertension in the Czech population from 1985 to 2007/2008. Atherosclerosis **211(2),** 676-81.

Clark H. 2013. NCDs: a challenge to sustainable human development. Lancet **381 (9866),** 510-511.

David Carrick D, Haig C, Maznyczka AM. 2018. Hypertension, Microvascular Pathology, and Prognosis After an Acute Myocardial Infarction. Hypertension **72(3),** 720-730.

Devi P, Rao M, Sigamani A. 2013. Prevalence, risk factors and awareness of hypertension in India: a systematic review. J Hum Hypertens **27(5),** 281-287.

Egan BM, Zhao Y, Axon RN. 2010. US trends in prevalence, awareness, treatment, and control of hypertension, 1988-2008. JAMA **303,** 2043-2050.

Ekelund E, Steene-Johannessen J, Brown WJ. 2016. Does physical activity attenuate, or even eliminate, the detrimental association of sitting time with mortality? A harmonised meta-analysis of data from more than 1 million men and women. Lancet **388(10051),** 1302-1310.

GBD. Risk Factors Collaborators. 2013. Global, regional, and national comparative risk assessment of 79 behavioral, environmental and occupational, and metabolic risk factors or clusters of risks in 188 countries, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet 2013.

Grundy SM, Benjamin IJ, Burke GL. 1999. Diabetes and cardiovascular disease: A statement for healthcare professionals from the American heart association. Circulation **100(10),** 1134-1146.

Huxley R, Barzi F, Woodward M. 2006. Excess risk of fatal coronary heart disease associated with diabetes in men and women: meta-analysis of 37 prospective cohort studies. BMJ **332(7533),** 73-78.

John RP, Tomasz JG, Rhian MT. 2018. Diabetes, Hypertension, and Cardiovascular Disease: Clinical Insights and Vascular Mechanisms. Canadian Journal of Cardiology **34(5),** 575e-584.

Katherine T, Mills KT, Bundy JD, Kelly TN. 2016. Global Disparities of hypertension Prevalence and control a systematic analysis of Population-Based studies From 90 countries. Circulation **134,** 441-45.

Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. 2005. Global burden of hypertension: analysis of worldwide data. Lancet **365(9455),** 217-23.

Kira G, Franziska S, Patrick S, Gabriele IS, Christine D, Winfried M. 2019. Cardiovascular mortality attributable to dietary risk factors in 51 countries in the WHO European Region from 1990 to 2016: a systematic analysis of the Global Burden of Disease Study. European Journal of Epidemiology **34(1),** 37-55.

Lancet. 2010. Diabetes mellitus, fasting blood glucose concentration, and risk of vascular disease: a collaborative meta-analysis of 102 prospective studies **375(9733),** 2215-2222.

Lanclet Global Health. 2018. The changing patterns of cardiovascular diseases and their risk factors in the states of India: the Global Burden of Disease Study 1990-2016. Lancet **6(12),** e1339-e1351.

Lara H, Martijn S, Van R, Joanne U, Maria P, Irene GMV. 2018. Ethnic differences in infectious burden and the association with metabolic risk factors for cardiovascular disease: a cross-sectional analysis. BMC Public Health **18,** 276.

Lawes CM, Vander Hoorn S, Rodgers A. 2008. International Society of Hypertension. Global burden of blood-pressure-related disease, 2001. Lancet **371(9623),** 1513-8.

Lloyd-Jones DM, Nam BH, D'Agostino SR. 2004. Parental cardiovascular disease as a risk factor for cardiovascular disease in middle-aged adults: a prospective study of parents and offspring. AMA **291(18),** 2204-11.

Murabito JM, Pencina MJ, Nam BH. 2005. Sibling Cardiovascular Disease as a Risk Factor for Cardiovascular Disease in Middle-aged Adults. JAMA **294(24),** 3117-3123.

Ogurtsovaa K, da Rocha Fernandesa JD, Huanga Y, *et al.* 2017. IDF Diabetes Atlas: Global estimates for the prevalence of diabetes for 2015 and 2040. Diabetes Res Clin Pract **128,** 40-50.

Petrie JR, Guzik TJ, Touyz RM. 2018. Diabetes, Hypertension, and Cardiovascular Disease: Clinical Insights and Vascular Mechanisms. Can J Cardiol **34(5),** 575-584.

Ralston J, Reddy KS, Fuster V, Narula J. 2016. Cardiovascular diseases on the global agenda: the United Nations high level meeting, Sustainable Development Goals, and the way forward. Glob Heart **11(4),** 375-379.

Ravi D, Ramachandran SV. 2011. Age as a Cardiovascular Risk Factor. Med Clin North Am **96(1),** 87-91.

Rawshani A, Rawshani A, Franzén S, Sattar N. 2018. Risk Factors, Mortality, and Cardiovascular Outcomes in Patients with Type 2 Diabetes. The new England journal of medicine **379(7),** 633-644.

Schramm TK, Gislason GH, Kober L. 2008. Diabetes patients requiring glucose-lowering therapy and nondiabetics with a prior myocardial infarction carry the same cardiovascular risk: a population study of 3.3 million people. Circulation **117(15),** 1945-1954.

Spencer EA, Pirie KL, Stevens RJ. 2008. Diabetes and modifiable risk factors for cardiovascular disease: the prospective Million Women Study. Eur J Epidemiol **23(12),** 793-799.

Stamatakis E, Gale J, Bauman A, Ekelund U, Hamer M, Ding D. 2019. Sitting Time, Physical Activity, and Risk of Mortality in Adults. Journal of the American College of Cardiology **73(16),** 2062 - 7 2.

Stevens RJ, Kothari V, Adler AI, Stratton IM. 2001. The UKPDS risk engine: a model for the risk of coronary heart disease in Type II diabetes (UKPDS 56). Clin Sci Lond **101(6),** 671-679.

Valerio L, Ron JP, Aeilko HZ, Winderman, Sara-Joan P. 2016. Association of Family History with Cardiovascular Disease in Hypertensive Individuals in a Multiethnic Population. J Am Heart Assoc **5(12)** DOI: 10.1161.

Vasan RS, Sullivan LM, Wilson PW. 2005. Relative Importance of Borderline and Elevated Levels of Coronary Heart Disease Risk Factors. Ann Intern Med **142(6),** 393-41.

WHO. 2013. Global action plan for the prevention and control of no communicable diseases: 2013-2020. Resolution WHA 66.10.

World Health Organization. 2003. Diet, nutrition, and the prevention of chronic diseases: report of a joint WHO/FAO expert consultation WHO. 916.

World Health Organization. 2014. Global status report on no communicable diseases 2014: attaining the nine global no communicable diseases targets; a shared responsibility. World Health Organization Geneva.

Young DR, Hivert MF, Alhassan S. 2016. Sedentary behavior and cardiovascular morbidity and mortality: a science advisory from the American Heart Association. Circulation **134,** e262-e279.

Yusuf S, Hawken S, Ounpuu S. 2004. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the Interheart study). Lancet **364(9438),** 937-52.

Yusuf S, Rangarajan S, Teo K. 2014. Cardiovascular risk and events in 17 low-, middle-, and high-income countries. N Engl J Med **371(9),** 818-827.

ANNEX -I

Cardiac Risk Assessment Tool

This form is used to document cardiac assessment interaction with a patient, and will provide an ongoing record. These questions not to be asked to the patient but are based on own assessments. This form should be completed at the end of the counseling session.

Personal Information	
Patient Name:	
Gender:	
Age:	
Address:	

1. Qualification

A. Illiterate B. Primary C. Metric D. Graduation

2. Employment

A. Employee B. Retired C. Jobless D. Business

3. Socioeconomic status

A. Low B. Middle C. High

4. Family history

A. Family history B. Without family history

5. Life style

A. No exercise B. with exercise

6. Smoking

A. Smoker B. Non smoker

7. MI risk factor

A. Diabetic B. non diabetic C. Hypertensive D. no B.P

8. Nutrition

A. High Carbohydrates B. Normal C. High Protein D. High Fats

9. For cooking use

A. Oil B. Ghee

Annex II

Consent Form

I _____ , aware that I have signed a letter of consent concerning the information presented in this performa by me and hereby declare that I have no objection against the use of information in this data for scientific study and research purposes (only).

(Signature of patient/ Guardian)

NOTE: All the data presented in the following performa by the patient is confidential and can only be used for the purpose of scientific study and research.