

## FREQUENCY OF CARDIOVASCULAR RISK FACTORS AMONG DAIRY WORKERS

YASIR ADNAN<sup>1</sup>, M.SAQIB QURESHI<sup>2</sup>, AHMAD FAWAD<sup>3</sup>,  
ADNAN MEHMOOD GUL<sup>5</sup>, MOHAMMAD HAFIZULLAH<sup>5</sup>

<sup>1-5</sup> Department of Cardiology, Lady Reading Hospital and Khyber Medical University, Peshawar Pakistan

Address for Correspondence:

**Dr. Yasir Adnan,**  
Department of Cardiology, Lady Reading Hospital, Peshawar Pakistan

E-mail: yasiradnan1982@hotmail.com

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### Contribution

All the authors contributed significantly to the research that resulted in the submitted manuscript.

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### ABSTRACT

**Objective:** To find out frequency of various risk factors for cardiovascular diseases in dairy workers

**Methodology:** This was a cross-sectional study involving dairy workers recruited in Peshawar Heart Study (PHS). All participants were interviewed in detail including family history, past medical history, smoking history and drug history. All participants pulse, blood pressure, body mass index (BMI) and waist hip ratio was determined. Their random blood sugar and total cholesterol was checked. ECG was carried out. Data was analyzed for cardiovascular risk factors.

**Results:** Total of 165 dairy workers were screened and interviewed. Mean age was 40 years. Male were 127 (77%) while females were 38 (23%). Mean BMI was  $26.93 \pm 5.833$ . Mean systolic BP was  $131.85 \pm 20.342$  mm Hg while mean diastolic BP was  $85.73 \pm 12.810$  mm Hg. Mean Random Blood cholesterol was  $161.25 \pm 20.60$  mg/dl. Mean random blood sugar was  $124 \pm 51.84$  mg/dl. Out of 165 dairy workers, 17 (10.3%) had random blood Sugar more than 180 mg /dl. Active smokers were 26 (15.8 %). Dairy workers not having any regular exercise schedule were 147 (89.1%).

**Conclusion:** We found that risk factors for cardiovascular diseases like lack of exercise, smoking, obesity and hypertension are quite frequent in this group.

**Key Words:** Cardiovascular Risk Factor, Dairy Workers

## INTRODUCTION:

Cardio-Vascular disease (CVD) has emerged as the dominant chronic disease in many parts of the world, and early in the 21<sup>st</sup> century it is predicted to become the main cause of disability and deaths worldwide. CVD accounts for nearly half of the all deaths in the developed world and 25 percent in the developing world. By 2020, it is predicted that CVD will claim 25 million lives annually and that will surpass infectious diseases as the world's number one cause of death and disability<sup>1</sup>.

The Indian subcontinent (including India, Pakistan, Bangladesh, Sri Lanka, and Nepal) may be one of the regions with highest burden of CVD in the world. The Indian subcontinent suffers from a tremendous loss of productive working years due to CVD deaths: an estimated 9.2 million productive years of life were lost in India, in 2000, with an expected increase to 17.9 million years in 2030<sup>2</sup>.

CVD has been reported to be the leading cause of morbidity and mortality in the world including Pakistan. Life-style related risk factors are associated with increased risks of cardiovascular disease. Since individual's life-style can be changed, these factors are regarded as modifiable. Lack of exercise can be regarded as an example of life-style related risk factor for CVD<sup>3</sup>.

CVD is a collection of diseases having different risk factors, like hypertension, diabetes mellitus, smoking, dyslipidemia, obesity and physical inactivity<sup>4-6</sup>. The mass occurrence of CVD relates strongly to lifestyle and modifiable physiological factors. Risk factor modifications have been unequivocally shown to reduce mortality and morbidity, especially in people with either apparent or silent CVD<sup>7</sup>.

Behavioral risk factors lead to increase in the prevalence and incidence of CVD. The prevalence of modifiable risk factors for CVD, such as tobacco use, unhealthy diet and physical inactivity, are responsible for significant morbidity and mortality<sup>8</sup>.

There is evidence to suggest that the control of cardiovascular risk factors, particularly smoking, has resulted in a decline in mortality in coronary artery disease in the west<sup>8</sup>. The adoption of an urbanized life style is thought to be among the major determinant of coronary artery disease morbidity and mortality in Pakistan. The control of CVD risk factors in Pakistan has been attempted, but with limited success<sup>9</sup>. National Action Plan for the prevention and control of CVD has been initiated in Pakistan in 2004<sup>10</sup>, but its results are still unknown.

Although western data has clearly shown relationship of various occupational groups and cardiovascular diseases risk factors, local data is scarce in this regard. Aim of Peshawar Heart Study is to study the pattern of cardiovascular risk factors among various occupational

groups serving in Peshawar and present study focuses on dairy workers.

The dairy sector has made continuous advancement over the years and today there is a wide variety of milks and dairy products readily available to the consumer. Dairy workers usually use dairy products in excess. In the case of dairy products, there has been a general perception that a food containing saturated fat is unlikely to be beneficial to health. Yet, over the last decade, evidence has been accumulated that the composition and quantities of dietary fat is very important in determining the relative risk to diseases such as CVD and cancer, and that milk-derived fat may offer significant health benefits compared to some common sources of dietary fats<sup>11,12,13</sup>.

Population studies, both cross-sectional and prospective cohort studies consistently show an association between dairy fat consumption and increased risk for coronary heart disease. Milk consumption has been claimed not to increase the risk of CHD but this may reflect the lower fat intake from milk than from butter. Dairy fat per se, best exemplified by butter, consistently raises LDL-C. Consumption of myristic acid, a major fatty acid in dairy fat generally raises LDL-C. Cheese appears to be an exception in that its impact on CHD is less than that of butter consumption and its intake leads to only small increments in LDL-C. However it appears to be associated with increased risk of metabolic syndrome and of obesity in cross-sectional surveys<sup>11</sup>.

## Methodology

This was cross sectional study involving dairy workers recruited in Peshawar Heart Study (PHS). All participants were interviewed in detail including family history, past medical history, smoking history and medication history. Dietary habits were explored. All participant's pulse, blood pressure, BMI and waist hip ratio was determined. Family history of CAD was considered positive if first degree relative had CAD at the age (men <50 and women <60). Body mass index and waist:hip ratio was calculated. Blood pressure was checked using mercury sphygmomanometer in sitting position with supported left arm. 12 LEAD ECG was performed using BTL-085 machine. Random blood sugar was checked using Accutrend GC portable device (ROCHE) by finger prick method. Data was analyzed for cardiovascular risk factors like hypertension, diabetes, smoking, body mass index, waist:hip ratio, exercise, hypercholesterolemia and family history using SPSS version 16. Hypertension was defined according to the JNC-7 criteria. Diabetes was defined according to WHO criteria. History of smoking was considered to be positive on the basis if 5 cigarettes were taken per day for >6 month. Hypercholesterolemia was defined according to ATP III guidelines.

**RESULT**

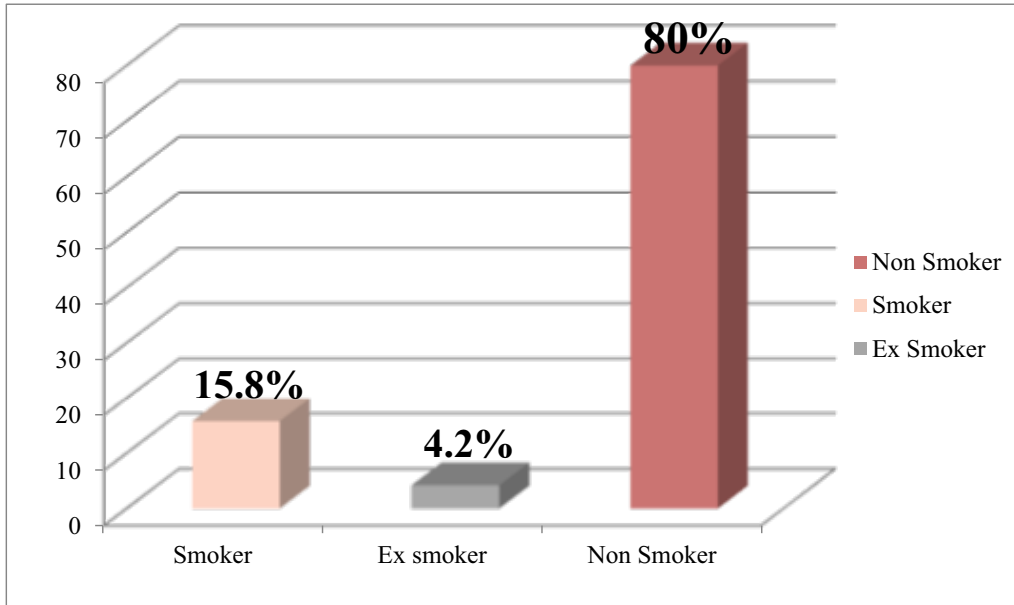
Total of 165 dairy workers were screened and interviewed. Mean age was 40 years . Male were 127 (77 %) while females were 38 (23%). Married dairy workers were 124 (75.2 %), while 35( 21.2 %) were unmarried.

Analyzing number of working hours, it was found that 51(30.9%) were having on average working hours from 2 to 8 hours a day while 96 (58.2%) were having on average

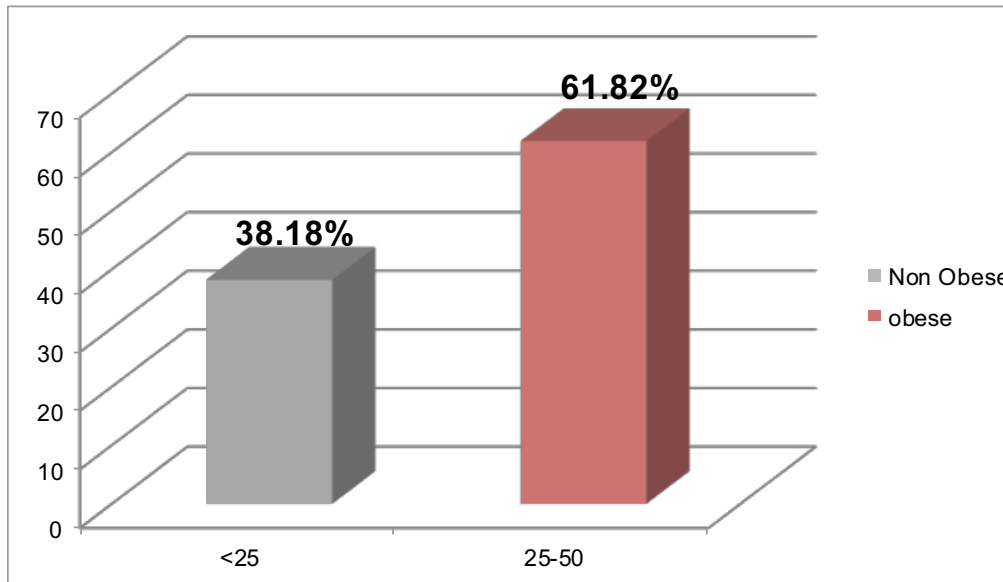
working hours from 7 to 12 hours a day. Eighteen dairy workers (10.9%) reported that their working hours range from 13 to 18 hours a day. Active smokers were 26 (15.8 %). Mean BMI was  $26.93 \pm 5.833$  while 64 (38.8 %) were having BMI between 25 to 30 . Thirty eight (23 %) were above 30 BMI. Mean Waist: Hip ratio was  $0.89 \pm 0.081$  while 79 (47.9%) dairy workers have Waist: Hip more than 0.9.

Food pattern was also analyzed in detail and it was found that dairy workers consuming 100 to 500 grams of meat

**Figure 1: Frequency of Smoking in Dairy Workers**



**Figure 2: Frequency of Obesity in Dairy Workers**



on average weekly basis were 132 (80%) while 33 (20%) dairy workers consumed meat in excess of 1400 grams per week. About 152(92.1%) were consuming 200 to 1400 grams vegetables on average weekly basis while 13 (8.9%) dairy workers consumed vegetables in excess of 1400 grams a week. No fruit intake was reported in their meals by 26 (15.8%) dairy workers.

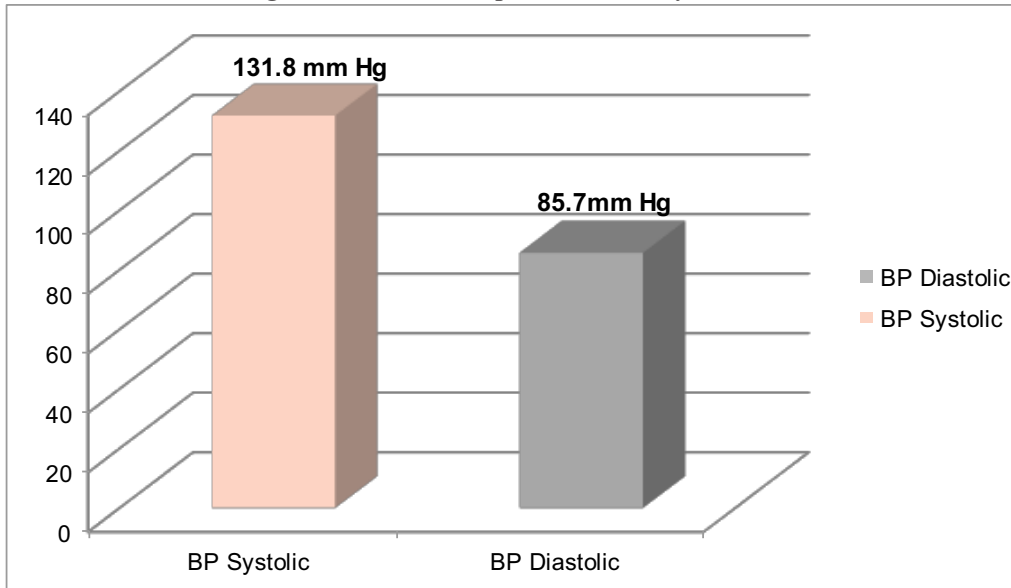
Dairy workers were asked about their daily prayers and it was found that 120 (2.77%) were offering prayers on regular basis while 37 (22.4%) were on irregular basis and

eight reported no prayers at all.

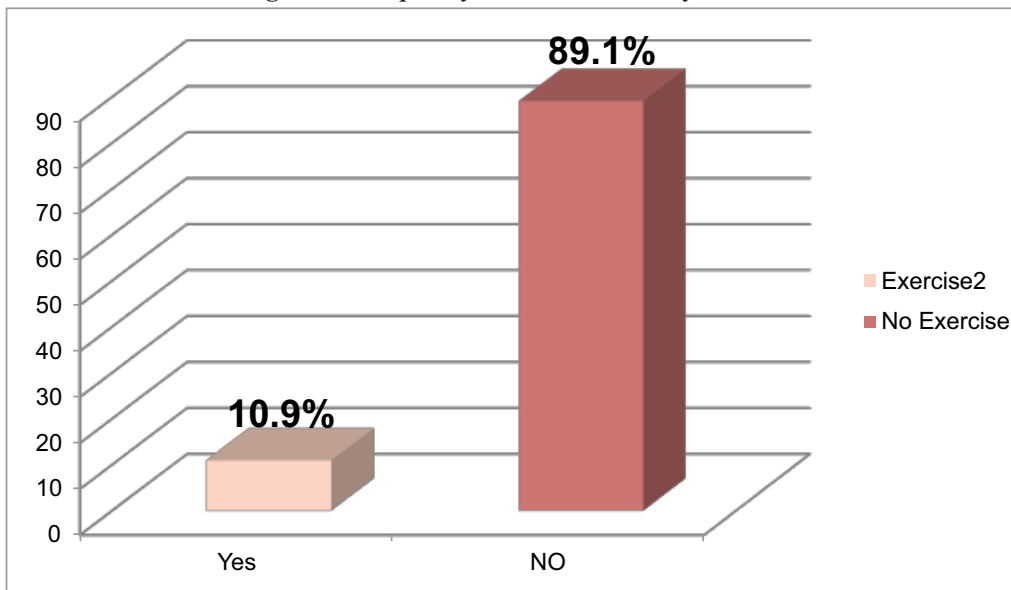
Mean systolic BP was  $131.85 \pm 20.342$  mm Hg while mean diastolic BP was  $85.73 \pm 12.810$  mm Hg. Thirty seven (37) dairy workers (22.4%) had systolic BP more than 140 mmHg while 33 (20%) had diastolic BP more than 90 mm Hg. Mean Random Blood cholesterol was  $161.25 \pm 20.60$  mg/dl. Blood cholesterol more than 180 m/dl was found in 22 (13.3%) dairy workers. Mean random blood sugar was  $124 \pm 51.84$  mg/dl. Out of 165 dairy workers, 17 (10.3%) had random blood Sugar more than 180 mg/dl. Dairy

**BMI**

**Figure 3: Mean blood pressure in dairy workers**



**Figure 4: Frequency of exercise in dairy workers**



workers not having any regular exercise schedule were 147 (89.1%).

## DISCUSSION

By 2025, CVD mortality on a worldwide scale will likely surpass that of every major disease group, including infection, cancer, and trauma<sup>9,10</sup>. This shift in the disease burden has also been reported in China where, vascular disease has become a leading cause of death<sup>15</sup>. No longer can CVD be considered a problem of affluence<sup>16</sup>. Although cardiovascular mortality has decreased by around three-quarters over the past 3 decades in countries such as Australia, Canada, the United Kingdom, and the U.S., rates in many low and middle income countries (LMIC) have increased over the same period<sup>16,17</sup>. At the beginning of the 21<sup>st</sup> century, this epidemic is gaining pace and is already the leading cause of death in many low and middle income countries (LMIC). Although safe and effective preventive treatments are available at low cost, it is still the case that most individuals for whom such treatments are recommended do not receive any care<sup>18</sup>. CVD is the leading cause of death in China and India the world's 2 most populous countries<sup>14,19</sup>. Even in countries such as South Africa, where deaths from HIV still dominate, the rate of deaths from high blood pressure has increased by 25% in less than a decade<sup>20</sup>.

Epidemiological studies have identified a number of important risk factors for CAD<sup>21, 22</sup>. These studies have demonstrated that most of the population attributable risk is explained on the basis of eight factors: abnormal lipids, smoking, hypertension, diabetes mellitus, abdominal obesity, psychosocial factors, consumption of too few fruits and vegetables, too much alcohol and lack of regular physical activities<sup>21,24</sup>.

Smoking remains the number one preventable cause of CAD<sup>25,26</sup>. Much of the preventive strategies in western countries have been directed against this habit including cessation of smoking in public areas including hospitals, parks, bus and train station etc. According to WHO, 1 year after quitting smoking, the risk of CAD decreases by 50%<sup>25,26</sup>. We found considerable number of dairy workers (15.8%) were addicted to smoking. Analyzing different occupational groups recruited in Peshawar Heart Study, active smokers were 21.7% among prisoners, 8.6% among teachers and 36% among Journalists<sup>29,30,31</sup>.

Hypertension as an independent risk factor for development of CAD has been well established<sup>2, 28</sup>. We found that considerable numbers of dairy workers were having hypertension both systolic and diastolic. Alarmingly most of these people were completely unaware of the situation. Stressful life events and Obesity could be contributing to this finding.

Overwhelming evidence indicate that hypercholesterolemia

and other lipids abnormalities provide an important risk factors for CAD<sup>9,10</sup>. Metabolic syndrome is a cluster of cardiovascular risk factor abnormalities associated with increased risk of type 2 diabetes mellitus, cardiovascular disease, and all-cause mortality. Elevated measurements of  $\geq 3$  of the following cardiovascular risk factors define the syndrome: waist circumference, blood pressure, fasting glucose, high-density lipoprotein (HDL) cholesterol, and triglycerides.

Both primary and secondary CVD patients can benefit from the development of a regular aerobic exercise program, dietary modifications, and weight loss. BMI is an easily obtainable measure that remains widely used as an indicator of overweight and obesity. Although other adiposity measures such as waist circumference may better capture the adverse metabolic changes that are likely to mediate the association between obesity and coronary heart disease.

In our study we found considerable numbers of Dairy workers (58.79%) were having BMI more than <sup>25</sup> whereas 58.3% in prisoners and 35% in teachers group of Peshawar Heart Study have BMI over 25<sup>29,30</sup>. This was a significant finding. The prevalence of overweight and obesity is increasing in most industrialized countries. Hypertension, hypercholesterolemia, and diabetes are among the clinical conditions that are important mediators of this association. Thus, obesity is an appropriate target for primary prevention efforts because its modification has the potential to influence several important clinical conditions. However, it is clear that achieving weight loss or preventing weight gain with aging is difficult for most individuals. Therefore, investigations of behavioral modifications that might reduce the impact of obesity is important.

We also found that 89.1 % of dairy workers were not having any regular exercise schedule and this could be partly contributing to obesity in this group. In Peshawar Heart Study 71.7% of prisoners and 41.4% of teachers were not having any regular exercise<sup>29,30</sup>.

Lack of exercise is also important independent risk factors as already mentioned. Mortality caused by coronary heart disease (CHD) was reported to be inversely related to the level of physical activity and less in subjects who exercise regularly. There are reports indicating that physical training done less frequently than 2 days per week generally produces no meaningful change in Vo2max.

Improving diet and lifestyle is a critical component of the American Heart Association's strategy for cardiovascular disease risk reduction in the general population. Specific goals are to consume an overall healthy diet; aim for a healthy body weight; aim for low cholesterol and triglycerides; aim for normal blood pressure; aim for a normal blood glucose level; be physically active; and avoid use of and exposure to tobacco products<sup>32</sup>. The

recommendations are to balance caloric intake and physical activity to achieve and maintain a healthy body weight; consume a diet rich in vegetables and fruits; choose whole-grain, high-fiber foods; consume fish, especially oily fish, at least twice a week; limit intake of saturated fat to <7% of energy, and cholesterol to <300 mg/day by choosing lean meats and vegetable alternatives, fat-free (skim) or low-fat (1% fat) dairy products and minimize intake of partially hydrogenated fats; minimize intake of beverages and foods with added sugars; choose and prepare foods with little or no salt<sup>33</sup>.

## CONCLUSIONS

We found that risk factors like physical inactivity and sedentary life style, obesity and hypertension were quite frequent in this group. Preventive measures like motivation regarding regular exercise, awareness about maintaining a healthy weight and BMI, should be taken. Stressful life events could be addressed by regular prayers and recitation of the Holy Quran.

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