

**Original article**

**Coronary Heart Disease: Impact of Socioeconomic Status on Unstable Angina/NSTEMI among Population of Karachi**

*Alam S<sup>1</sup>, Naqvi SBS<sup>2</sup>, Aslam M<sup>3\*</sup>*

**Abstract:**

**Background:** In health care system, socioeconomic discrepancy considered as one of the important factor particularly in case of coronary heart disease, substantially higher in lower status individuals described by education, employment position or earnings. **Objective:** The aim of this study was to analyze the association of socioeconomic impact on unstable angina (UA)/Non-ST elevated myocardial infarction (NSTEMI) among population of Karachi, the largest city of Pakistan. **Methods:** A prospective survey was conducted in the government and private hospitals of Karachi. Overall 487 hospitalized patients of unstable angina / NSTEMI were included during the study period of 2013-2014. Information on SES was collected through well structured questionnaires. The statistical analysis was carried out using SPSS version 20.0. **Results:** Educational level and income seemed to be the most important measures of socioeconomic indicators in relation to the coronary artery disease in the study population. People with lower socioeconomic status had higher levels of unstable angina/NSTEMI admissions and re-hospitalization. The association between socioeconomic status and UA/NSTEMI was more consistent among both genders. **Conclusion:** Socioeconomic inequalities were more in communities, whose living standard comes under lower economic categories in association of less educational status. Lower SES found strong contribution in hospitalized patients with unstable angina/NSTEMI.

**Key Words:** Socioeconomic status, Coronary heart disease, Unstable angina/NSTEMI

*Bangladesh Journal of Medical Science Vol. 15 No. 03 July'16. Page : 343-346*

**Introduction:**

In health care system, socioeconomic discrepancy considered as one of the important factor particularly in case of coronary heart disease, substantially higher in lower status individuals described by education, employment position or earnings. Economic factors, educational attainments and social isolation are secondary reasons for cardiac disorders; they do not affect the pathology directly.<sup>1</sup> It has been shown constantly that socio economic status (SES) inversely proportional to cardiovascular morbidity and death rate.<sup>2</sup> Individuals having lower socioeconomic status supposed to be more prone towards coronary disorders and their disease indicators managed more aggressively comparative to those who are wealthier or live in better culture

with good educational status. The main causes behind that attributed to lack of health-care contacts or improper treatments as well. Social deprivations and sufferings in childhood may result in lasting traumatic conditions that take an enormous excise on the heart. Cumulative effects of social obstacles throughout the lifetime could also cause more erosion on the cardiac system. Much of this inconsistency is attributable to higher cardiovascular mortality, particularly from coronary heart disease (CHD), among persons of lower SES. Social and behavioral risk factors, access to care, and systematic underestimation of risk among persons with lower SES in clinical care.<sup>3</sup> In United States, coronary heart disease (CHD) regarded as primary source of death in association of numerous risk

1. Shazia Alam, Department of Pharmaceutics, Faculty of Pharmacy, University of Karachi-75270, Pakistan.
2. Syed Baqir S Naqvi, Department of Pharmaceutics, Faculty of Pharmacy, Hamdard University of Karachi, Pakistan.
3. Muhammad Aslam, Department of Basic Medical Sciences, Faculty of Pharmacy, Ziauddin University, Karachi-75600, Pakistan.

**Corresponds to:** Dr. Muhammad Aslam, Assistant Professor, Department of Basic Medical Sciences, Faculty of Pharmacy, Ziauddin University, Karachi, Pakistan. **E-mail:** Pharmacologist1@yahoo.com

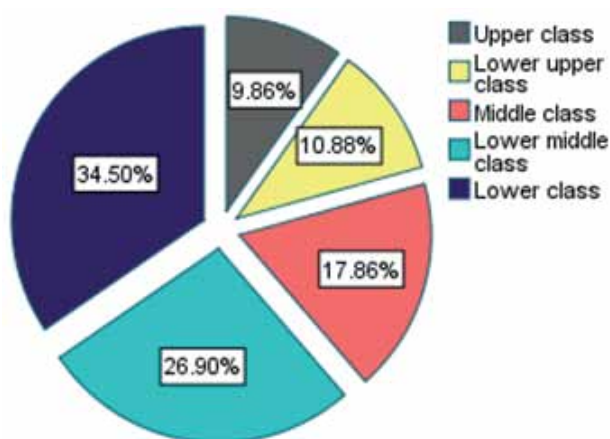


Figure 1: Socioeconomic Status

factors such as male gender, older age, overweight, lack of exercise, smoking, high blood pressure, and diabetes mellitus and their consequence might occur largely as increased mortality, also varies geographically.<sup>4</sup> Low socioeconomic status and atherosclerotic condition clearly manifest heart disease.<sup>5</sup> Low job control considered as one of the most toxic element of chronic work stress and is more prevalent among people working in lower status jobs.<sup>6</sup> In fact, the most important factor affecting the health of communities is related to social and economic elements. People are more susceptible towards health issues who have less access to medical and social facilities, get sicker and die earlier than people in more favorable social environment.<sup>7</sup> In advanced countries, CHD cases found less among individuals in higher socioeconomic groups, and the extended differences was observed in the event rate between upper and the poorer socioeconomic groups. Despite of SES measure used, various evidence reported for the existence of an inverse correlation between SES and cardiovascular risk factors in urbanized countries, with only few exceptions.<sup>8</sup> Preventive activities contributed to turn down CHD with greater impact on public health in top socioeconomic categories and resulted in absolute cardiovascular disparities in modern societies.<sup>9, 10</sup> Acute coronary syndrome (defined here as unstable angina and non-ST elevation myocardial infarction. Unstable angina with non-STEMI is a spectrum of disease that involves an imbalance of supply and demand of oxygen available to the myocardium; this causes sudden chest pain and often gets worse over a short period of time. It occurs with less activity even at rest. Pain lasts longer than 15 - 20 minutes along with shortness of breath, sweating, discomfort at

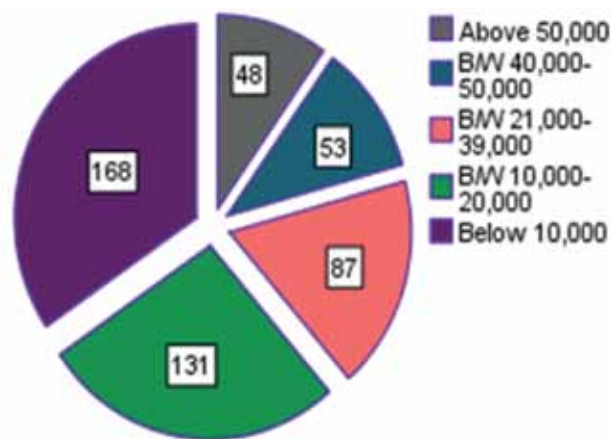


Figure 2: Monthly Income

shoulder, arm, jaw, neck, back. In the United States, the annual incidence of unstable angina is about six out of 10,000 persons in the general population.<sup>11</sup> A study report showed approximately 33,500 admissions of unstable angina in Spain and 4.5% of them die within 3 months of admission.<sup>12</sup>

### **Materials and methods**

#### **Sampling technique**

Total 487 hospitalized patients who were suffering from UA/NSTEMI enrolled during the study period of 2013- 2014. Questionnaire used were validated and verified by panel of experts and after several amendments, approved for further assessment to assure the uniformity in data collection throughout the research period. The questionnaire mainly deal with baseline demographics, socioeconomic factors including education, occupation, monthly income, marital status, socioeconomic status were imputed to analyze the results.

#### **Data analysis**

Data was analyzed statistically using software SPSS version 20.0 and Chi square test was applied to identify the significant association among variables.

#### **Ethical approval**

Permission was obtained before conducting the study from the ethics committee of the institutions. The purpose of the study was explained in details to the participants and confidentiality was ensured. Informed consent was taken from each participant of study prior to fill questionnaire.

#### **Results**

Overall 487 unstable angina/NSTEMI patients admitted with a mean age of 59 years among which 68% were males and 32% were females and majority of patients 36% exist within the age group of 55-64 years old. Around 73% of patients those interviewed reported their marital status as married

**Table 1:** Socioeconomic Demographic Characteristics among Participants (n=487)

Characteristics	Frequency (%)
<b>Gender</b>	
Male	333 (68)
Females	154 (32)
<b>Age group (Years)</b>	
35-44	35(7)
45-54	118 (24)
55-64	179 (37)
65-74	122 (25)
75+	33 (7)
<b>Mean 59 years</b>	
<b>Marital status</b>	
Married	355 (73)
Unmarried	90 (18)
Widowed	42 (9)
<b>Educational Level (Years)</b>	
0-6	209 (43)
7-12	186 (38)
≥ 13	92 (19)
<b>Occupation</b>	
Employed	135 (28)
Unemployed	177 (36)
Retired	103 (21)
Housewives	72 (15)

**Table 2:** Socioeconomic Status and Admission Type

Socioeconomic Category	Admitted Once	Re-hospitalized
Upper Class	35	13
Lower Upper Class	41	12
Middle Class	62	25
Lower Middle Class	102	29
Lower Class	129	39
<b>Total</b>	<b>369</b>	<b>118</b>

and 18% unmarried. Furthermore, amongst majority of patients, unwaged level was 36% while 21% were retired. Interestingly, 28% of the respondents were much more likely to be employed and only 18% got education above secondary level. Figure 1 showed 34% of patients were classified to have lower SES in contrast to 10 % families of upper SES. Income defined as earnings and recorded in five categories. Figure 2 indicated that majority of patients have their monthly earning less than 10,000 PKR. Approximately 168 UA/NSTEMI patients were from lower socioeconomic status contributed low income status (< 100 \$ per month) comparative to few UA/NSTEMI admissions of

upper class families, only 48 UA/NSTEMI patients who had monthly income above 50,000 PKR and categorized in highest income level (> 450 \$ per month). We also detected interactions among SES and admission type. Patients either admitted once or re-hospitalized was more common in lower SES expected 129 and 39 respectively comparative to 35 and 13 patients who ranked as upper class of SES in both admission cases. This study reports the significant association between SES and income. The disparity in SES showed considerable inequalities in income state and such differences was more significant (0.00 since  $p < 0.05$ ).

### Discussion

Socioeconomic status (SES) is commonly concerned as a contributor for the disparate health observed among all populations. SES indicators such as education, earnings and employment are associated with coronary heart disease (CHD) leading increased risk of morbidity and mortality. However, it is often noticed that differences in SES develop the differences in health status and outcomes between population groups. Potential disparities among SES and cardiovascular disease have been a focus of numerous research efforts. Such disparities may arise between gender and socioeconomic groups. The fundamental consequence of poor socioeconomic status faces difficulty while affording medical care, health care because of poor access to care, delay in seeking care, inadequate treatment. A few studies have reported socioeconomic patterns of mortality among patients with unstable angina. A clear socioeconomic guide was found as higher the socioeconomic position, the lower the mortality. Patients with lower SES had considerably more readmissions along with poorer quality of life.<sup>13</sup> In our study, the effects of profession, revenue, and marital status differed for both genders. These findings proposed education as the main part of the four socioeconomic indicators in relation to UA/NSTEMI among the study population. As far as research concerned, very few studies compared different SES in industrialized countries. Information or identical records for developing countries was not accessible. One of study selected the inclusion of education, employment, and income as potential factors and exposed that educational level was the only measure of SES significantly related with cardiovascular risk factors in an American population.<sup>14</sup> Another report suggested that education robustly correlate with coronary artery disease in contrast to employment and earnings among the citizens of the Federal

Republic of Germany.<sup>15</sup> Results of an investigation signified that SES had different interaction with cardiovascular risk factors. A study concluded that no matter the gender is, different socioeconomic indicators produced unusual effects on population's wellbeing; men and women may express variations in health outcomes even though they are exposed to the same SES.<sup>8</sup> Our findings therefore suggested that education and income seems to be the strongest measure for assessing the association between SES and unstable angina/NSTEMI for people with higher SES tends to have lower levels of disease state. Cardiovascular mortality still is the major cause of death particularly among the socially deprived areas, although has reduced markedly in developed countries. Health care strategy should cover all levels of society, forming an extensive and successful health promotion. Legislative action and environmental changes may be particularly important in Karachi to prevent and control coronary

artery disease.

### **Conclusion**

In developed countries socioeconomic status has been proven to be an important factor in the progression of cardiovascular disease. Poorer socioeconomic status is associated with increased admissions of UA/NSTEMI found in Karachi. However, such patients are more likely to be readmitted with chest pain and lower quality of life.

### **Acknowledgement**

The research described in this paper is made possible through the support of government and private Institutions for uniform data collection in patients who suffered UA/NSTEMI. I am thankful to hospital administration for permission to use the data in this study. Special thanks to those who helped in this study.

### **Conflict of interests**

The authors report that there is no conflict of interest.

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