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RESEARCH ARTICLE

Association between Occupation and Cardiovascular Mortality: A Study of Bist Doab (Punjab, India)

Anandvir Kaur Saini

Ph.D. Research Scholar, Department of Geography, Panjab University, Chandigarh (India)

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*Corresponding Author

Anandvir Kaur Saini

Abstract

Occupation is an important factor in determining the socio-economic status of an individual in the society. The aim of this paper is to examine the association between occupation and cardiovascular mortality in Bist Doab region of Punjab. This paper has been based on primary data collected through extensive fieldwork. A sample size of 1.5% was selected out of the total 6796 cardiovascular deaths recorded in deaths registers of all villages of Bist Doab in 2009. A detailed interview schedule was prepared and administered on the family members of the selected 100 deceased persons. It has been found that most of the sampled males who died from cardiovascular ailments were engaged in medium and low status jobs. The males belonging to the lowest segment of occupations had the greatest prevalence of major cardiovascular risk factors.

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Introduction

The socio-economic environment of a region has an important role to play in determining health status of the population. Social and economic factors such as literacy, education, occupation and income have been suggested to be significant contributors to mortality from cardiovascular diseases. The socio-economic status is generally defined as the social standing or class of an individual. Occupation is an important factor in determining the socio-economic status of an individual in the society. The aim of this paper is to examine the association between occupation and cardiovascular mortality in Bist Doab region of Punjab. Bist Doab region of Punjab is one of the three cultural regions of Punjab, the other two being Majha and Malwa. In 2001, the population of Bist Doab was 4,770,477 which accounted for 19.64% of Punjab's total population. Out of this 71.58% people lived in rural areas. The literacy rate of the region was 77.33% and 67.5% of the population is engaged in non-agricultural activities.

Data and Methods

This paper has been based on primary data collected through extensive fieldwork. A sample size of 1.5% was selected out of the total 6796 cardiovascular deaths recorded in deaths registers of all villages of Bist Doab in 2009. A detailed interview schedule was prepared and administered on the family members of the selected 100 deceased persons. The questions pertained to the socio-economic and behavioral aspects of the persons who died from cardiovascular diseases. The sampling design was divided in two stages. At the first stage around 20 villages were sampled from all the major hot spot clusters of villages recording high cardiovascular mortality using proportionate sampling. Bigger the hot spot, higher was the number of villages in sample. At the second stage snowball sampling was used to choose five deaths from each selected village with the help of the concerned village officials. The collected data was processed and analyzed in MS Excel software. Tables were prepared and a bar diagram was constructed for data representation.

Results

The categorization of the sampled population according to India's National Classification of Occupations (2004) reveals that it is only the male persons in the sample who were engaged in some kind of economic activity, while all the females were reported to be non-workers (Table 1). As far as the males are concerned, 25.35% were working in elementary occupations (labourer and rickshaw pullers), 21.13% were skilled agricultural workers (farmers), 16.90% worked in craft and related trades (tailors, masons, plumbers, ironsmiths, carpenters and mechanics), 12.13% were engaged in occupations related to service, shop and market sales (army and police personnel and shopkeepers) and 5.63% belonged to the category of plant and machine operators and assemblers (drivers). Only 4.23% of the men were working in the category of professionals (college lecturers and school teachers) and 2.82% were employed as clerks. Around 3% of the men could not be classified by any occupation and 8.45% belonged to the category of non-workers (Fig 1). This data shows that a large majority of the sampled males who died from cardiovascular ailments were engaged in medium and low status jobs.

The occupational categories mentioned above can be clubbed into the following four hierarchical groups according to their status in society (Table 2):

- (i.) **Occupations having High Status:** This class of occupations exclusively includes the top white collar jobs namely, legislators, senior officials, managers and professionals. Only 4.23% males in the sample belonged to this category and all of them were in the sub-group of 'professionals' only. None of them belonged to the highest sub-group of legislators, senior officials and managers. The average per head monthly household income of the sampled males engaged in these occupations was Rs.11422, which is highest among all the categories. The mean BMI of these men was 23.81 kg/m², which falls in the normal category (18.5 to 24.9 kg/m²) of standard BMI classification. Only 33.33% of men in this category consumed alcohol, which in the lowest proportion among all the categories. The average amount of liquor intake was 120 ml/day, which is again much lower in comparison to occupations with lower socio-economic status. The proportion of smokers in this category was nil. On the whole, the high socio-economic status of these men seemed to have a beneficial influence on their health by reducing the risk of cardiovascular diseases. As a result of this, the mean age at death was highest in this category (73.67 years) as compared to the occupations with lower status.
- (ii.) **Occupations having Moderately High Status:** This category includes technicians and associate professionals, clerks, service workers and shop and market sales workers. Out of the total men in the sample, 15.49% fall in this group. Their monthly per head household income was Rs. 5752. The mean BMI of this group (22.11 kg/m²) was lower than the upper category of occupations. However, the incidence and quantity of alcohol consumption was comparatively higher. Around 45% of the males in this group consumed alcohol and the average liquor intake was 188.29 ml/day. The proportion of smokers was 9% and the average number of cigarettes and bidis smoked by them was 20 per day. The mean age at death of this group stood at 62.36 years, which was quite lower than the men who were engaged in highest category of occupations.
- (iii.) **Occupations having Moderately Low Status:** This group encompasses skilled agricultural workers, craft and related trade workers, plant and machine operators and assemblers. The maximum proportion (43.66%) of males in the sample belonged to this category. The per head household income of this group was quite low (Rs. 1790 per month) than the upper two categories. The mean BMI of this group was highest (24.53 kg/m²) among all occupational categories. The consumption of alcohol was also very high. As many as 77.42% men in this segment consumed alcohol and the average consumption was 241.37 ml/day. The habit of smoking cigarettes and bidis was also more prevalent as compared to the upper two groups. Around 13% men belonging to this category were smokers and on an average they smoked 29.57 cigarettes and bidis per day. Owing to the higher prevalence of lifestyle-related cardiovascular risk factors, the mean age at death of this segment of population is lower (56.45 years) than the males engaged in occupations having higher status.
- (iv.) **Occupations having Low Status:** Approximately 25% of the sampled males belonged to this category of elementary occupations, which include labourers and rickshaw pullers. These men had lowest per capita household income (Rs. 1236 per month). The mean BMI was also low at 22.89 kg/m², owing to the physically demanding nature of their jobs. However, the prevalence of liquor consumption was highest (78%) among all categories and the average amount of alcohol consumed was also quite high (217.35

ml/day). Cigarette and bidi smoking was also highest in this group of occupations. More than 44% of the males in this group were smokers and their average rate of smoking was 19.5 cigarettes and bidis per day. Thus the men belonging to this lowest segment of occupations had the greatest prevalence of major cardiovascular risk factors and the poor cardiovascular health is reflected by their mean age at death (55.56 years), which is lowest among all the categories.

- (v.) **Unclassified Occupations and Non-Workers:** Around 11% of the sampled males fall in the category of not employed. The monthly per capita household income of these persons was Rs. 2336.62. Their mean BMI was 22.34 kg/m² and 50% of them consumed alcohol. The average alcohol intake of consumers was 172.43 ml/day. Around one-fourth of the deceased in this category were smokers and the average number of cigarettes and bidis smoked by them was as high as 30 per day. The mean age at death of this category of sampled males was 63 years. In all, the males in this category had better health status than those with low and moderate occupational status.

Table 1
Rural Bist Doab: Occupational Classification of Sampled Population, 2009

	Occupation Categories	No. of Males	Proportion out of Total Males (%)	No. of Females	Proportion out of Total Females (%)	Total	Proportion out of Total Deceased (%)
1	Legislators, Senior Officials and Managers	0	0	0	0	0	0
2	Professionals	3	4.23	0	0	3	3
3	Technicians and Associate Professionals	0	0	0	0	0	0
4	Clerks	2	2.82	0	0	2	2
5	Service Workers and Shop & Market Sales Workers	9	12.67	0	0	9	9
6	Skilled Agricultural and Fishery Workers	15	21.13	0	0	15	15
7	Craft and Related Trade Workers	12	16.90	0	0	12	12
8	Plant and Machine Operators and Assemblers	4	5.63	0	0	4	4
9	Elementary Occupations	18	25.35	0	0	18	18
10	Workers Not Classified by Occupations	2	2.82	0	0	2	2
11	Non-Workers	6	8.45	29	100	35	35
	Total	71	100	29	100	100	100

Source: Interview Schedule Survey, 2012

Table 2
Rural Bist Doab: Occupational Status and Other Characteristics of Sampled Population, 2009

Status of Occupation of Males	Proportion of Males (%)	Per Capita Household Income (Rs./month)	BMI (kg/m ²)	Alcohol Consumers (%)	Mean Alcohol Intake (ml/day, drinkers only)	Smokers (%)	Average No. of Cigarettes & Bidis (No./day, smokers only)	Mean age at Death
High	4.23	11422.22	23.81	33.33	120.00	0.00	0.00	73.67
Moderately High	15.49	5751.95	22.11	45.45	188.29	9.00	20.00	62.36
Moderately Low	43.66	1789.51	24.53	77.42	241.37	12.90	29.57	56.45
Low	25.35	1236.05	22.89	77.78	217.35	44.44	19.50	55.56
Unclassified Occupations & Non-Workers	11.27	2336.62	22.34	50.00	172.43	25.00	30.00	63.00

Source: Interview Schedule Survey, 2012

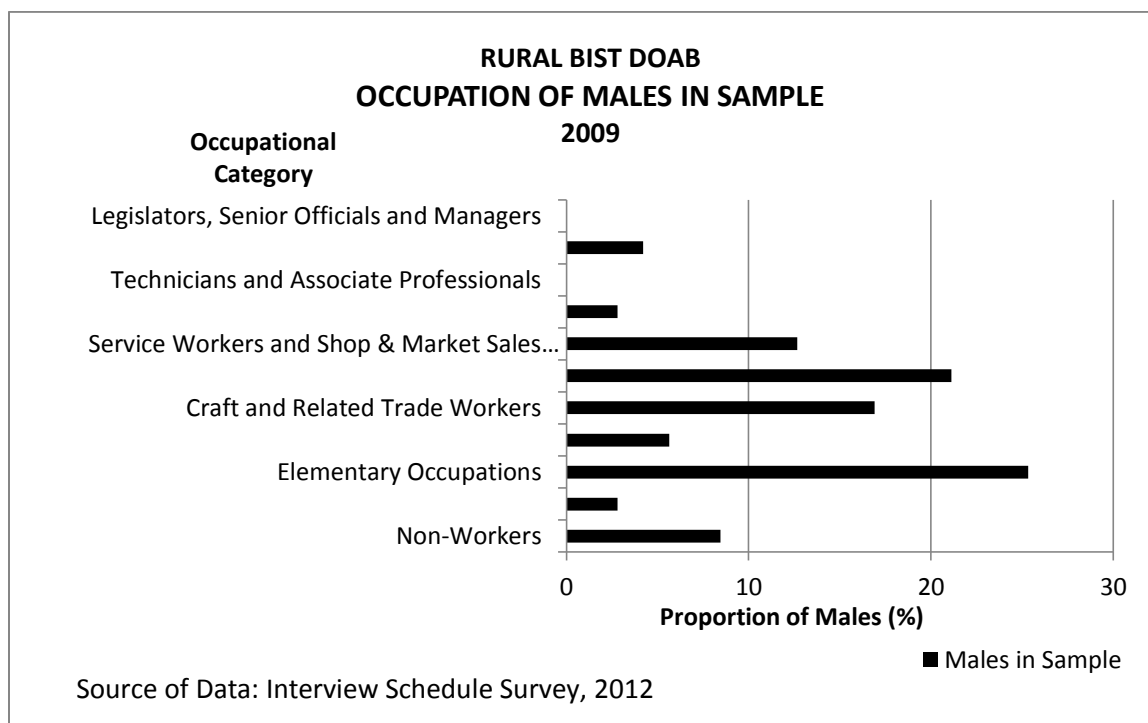


Fig 1- Rural Bist Doab: Occupations of Males in Sample

Discussion

It has been found that in Bist Doab region, the males employed in occupations with higher status have lower prevalence of major cardiovascular risk factors. As far as the females in the selected sample are concerned, all of them can be classified as non-workers because they were reported to be housewives. Their average BMI worked out to be 24.56 kg/m², which is higher than all the occupational categories of males.

Many recent studies have been conducted on the role of occupation in the development of cardiovascular diseases. Chikani et al. (2005) found that rural farm residents had a higher prevalence of cardiovascular risk factors and were more likely to be occupied in passive jobs with low levels of demand and control. Job stress predicted more cardiovascular risk factors among farm residents compared to non-farm residents. Chaparro et al. (2011) also found that the prevalence of cardiovascular risk was greater in workers in agriculture and construction sector than those in industry and service sectors. In other words, the cardiovascular risk was higher in blue-collar than in white-collar occupations. These differences indicate that working in these sectors is associated with modifiable unhealthy lifestyles. Shifting the focus to work history of individuals, Greenlund et al. (2010) found that the people who had participated in white-collar jobs as young adults had a lower probability of cardiovascular disease risk than those in blue-collar jobs. To the contrary, some studies have also reported an inverse relationship between occupational status and prevalence of major cardiovascular risk factors (Galobardes et al., 2000; Sjogren et al., 2003).

Ainy and Azizi (2007) demonstrated a higher level of cardiovascular risk factors among housewives. The BMI of housewives was reported to be higher as compared to working women. Cardiovascular diseases have their roots in unhealthy lifestyles over a prolonged period. Unhealthy nutrition and low physical activity are among the major lifestyle issues for housewives. Modernisation has resulted in a decrease in occupational physical activity (Ding et al., 2011). Freak-Poli et al. (2011) conducted an experiment on increasing the physical activity at workplace through the use of pedometer. The completion of this four-month program was associated with improvements in behavioural and anthropometric risk factors for cardiovascular diseases. The evaluation of the program demonstrated that workplace health programs aiming to increase walking through use of pedometer not only have the ability to improve physical activity levels, but also have immediate benefits on a range of cardiovascular risk factors. These health benefits were observed for males and females at all ages, highlighting the potential impact of the workplace as a setting for chronic disease prevention as it captures younger adults, who are traditionally less likely to act on their health.

Conclusion

In the end, it is concluded that most of the sampled males who died from cardiovascular ailments were engaged in medium and low status jobs. Approximately 25% of the sampled males belonged to the lowest category of elementary occupations, which include labourers and rickshaw pullers. These men had lowest per capita household income. The mean BMI was also low, owing to the physically demanding nature of their jobs. However, the prevalence of liquor consumption was highest among all categories and the average amount of alcohol consumed was also quite high. Cigarette and bidi smoking was also highest in this group of occupations. Thus the men belonging to this lowest segment of occupations had the greatest prevalence of major cardiovascular risk factors. Therefore, cardiovascular mortality and occupational status are associated with each other, with lower occupational status resulting in higher level of cardiovascular mortality.

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