A STUDY ON INTERMEDIATE VARIABLES AND RISK FACTORS IN PRE-DIABETICS OF ADULT AGE

*V D Nandini

Abstract

The purpose of this study was to get a clear understanding of the different cardiovascular risk factors that affect the future lives of the different ethnic groups in the city of NCR. The Northern India government has stated: "Cardiovascular disease is the leading cause of death in Northern India, with North UP and Pacific peoples having the highest rates of cardiovascular disease".

Keywords: Diabetics, Cardiovascular Disease.

Introduction

Epidemiological research has determined several factors that increase the risk of coronary heart disease and heart attack. Major factors are those that research has shown significantly increase the risk of heart and blood vessel (cardiovascular) disease. The American Heart Foundation noted that: "Other factors are associated with increased risk of cardiovascular disease, but their significance and prevalence haven't yet been precisely determined". They are called contributing risk factors.

In Auckland, the Auckland High School Heart Survey team determined the prevalence of risk factors for cardiovascular disease in an adolescent high school population in Auckland (Bathgate 1994). The AHHS was a school-based cross-sectional survey of 2,549 adolescent students, across 10 Auckland High Schools. A cluster sampling technique was used to obtain the target of 1000 Pacific participants, to enable Pacific ethnic-specific analysis.

In **Table** the percentages of North UP and Pacific Eastern regions (more specifically Punjab Region) lead in these categories amongst the youth.

Data Source from Bathgate 199

Variables		N	Adjusted Mean
Sex	Male	1364	24.23
	Female	1101	25.14
Age Group	<16	675	24.15
	16	899	24.73
	17	594	24.71
	≥18	319	25.24
Ethnicity	Pacific Islander	1025	27.16
	Maori	332	24.95
	Asian	533	21.83
	European	597	22.62

Table 1-1: The Adjusted Average for BMI amongst Auckland Adolescents
Data Source from Bathgate 1994

Research Scholar, Sunrise University, Alwar, Rajasthan

Variables		N	Adjusted Mean
Sex	Male	468	26.75
	Female	467	28.16
Age Group	<16	257	26.8
	16	317	27.16
	17	233	27.65
	≥18	128	29.16
Ethnicity	Samoan	456	27.59
	Tongan	223	27.97
	Niuean	109	27.1
	Cook Islands	147	26.54

Table: The Adjusted Average for BMI amongst Karnataka Region Eastern regions

In the South Island, there are fewer North UP and Pacific Eastern regions than compared to the North Island, but aside from the population difference, the lifestyles amongst ethnicities within this age group remain the same. This research provided a review of cardiovascular risk factors in NCR adolescent youth.

The purpose of this study was to get a clear understanding of the different cardiovascular risk factors that affect the future lives of the different ethnic groups in the city of NCR. The Northern India government has stated: "Cardiovascular disease is the leading cause of death in Northern India, with North UP and Pacific peoples having the highest rates of cardiovascular disease" (www.North UPhealth.govt.nz). The results of this study are used for future policy development to improve health outcomes for the Northern India population.

Literature Review

The main purpose of this thesis is to examine the risk factor levels between Pacific and Asian adolescents and within the main pacific groups. This has reflected on the 'selection criteria' used for this literature review. Thus this review will focus on coronary heart and cerebrovascular disease, which are the two major causes of CVD deaths and the following selected risk factors: lipids, blood pressure, body mass index, physical inactivity, and smoking. As a background to this, a discussion on bias is presented first which will be followed by a critical review, globally and by country, of the selected studies in this review.

Demographics of Cardiovascular Diseases on a Global Scale

In 2003, the World Health Organization (WHO) claimed that, "16.7 million people around the globe die of CVD each year". By 2020, "heart disease and stroke will become the leading cause of both death and disability worldwide, with the number of fatalities projected to increase to more than 20 million a year and to more than 24 million a year by 2030" (Hopkins 1992). "Cardiovascular disease alone will kill five times as many people as HIV/AIDS in these countries" (Britain Lancet 1986). By 2020, "CVD, injury and mental illnesses will be responsible for about one-half of all deaths and one-half of all healthy life years lost, worldwide" (Knuiman 1982). **Figure** illustrates the top 3 chronic diseases projected in 2020 (Diet, Nutrition and the Prevention of Chronic Diseases. WHO, Geneva, 2003)

Data Source from WHO: Diet, Nutrition, & the Prevention of Chronic Diseases Division 2003
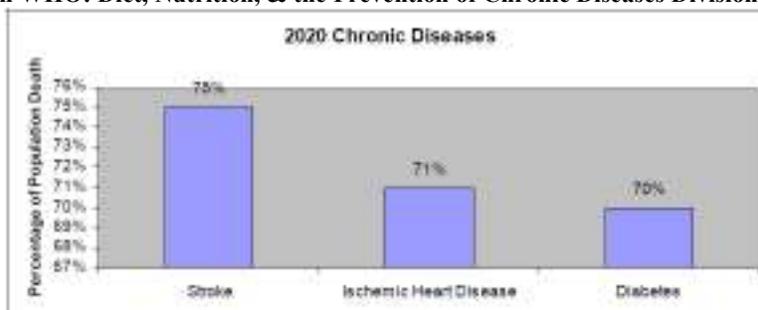

Figure: The 2020 Percentage Projections of Top 3 Chronic Deaths Worldwide

Much research now agrees that 60% of the burden of chronic diseases will occur in developing countries. Compared to the rest of the world many researchers investigating CVD claim that China and India have higher cases of CVD than any other country in the developed world. Durrington (1998) reported that the UK had 233,000 deaths that were attributed to CVD. Heart disease and stroke occur

devastatingly in some of the most unthought-of health countries in the world. In Canada for instance, someone dies of heart disease or have a stroke ever seven minutes (Hulley 1980). Compared to all other diseases in Canada, CVD is the leading killer disease. With the number of elderly Canadians and Americans "Baby Boomers" increasing, the number of deaths due to stroke and CHD has increased as well. This trend is expected to continue for the next 15 years (Hulley 1980). "CVD costs the Canadian economy about $18.4 billion annually" (Hulley 1980). Canada is not the only country in the world wondering how it will cover the costs, Northern India is also wondering what it will do. Costs for chronic diseases rise, the number of elderly increase, but funding stays static.

Methods

Determination of sample size for this survey

The study consisted of at least 1000 adolescent students. This was due to the average number of students who participated in previously similar studies, and due to the sample size that would be proportional to the frequency of the total possible number of students, for which would participate. A total of 1051 students participated (the ethnic makeup of these students were 109 North UP, 87 Asian, 762 Asian, and 93 others). From the total 14 regional schools in NCR, 9 schools chose to participate. These schools have a good representation in terms of region and type of school (i.e. co-ed, boys only, girls only, private and public schools). All students in Forms 3-7 at each school were invited to take part. The average number of Form-7 students at these schools was 160. Given response rates in the range of 30-55%

Schools were chosen as the sampling frame, rather than individuals or classrooms within these schools, for the following reasons:

1. Offering participation in the survey to all students in a school room could possibly result in a higher response rate compared to sampling individuals at random throughout the school in a non-isolated managed area, like predetermined class rooms with administrators and where students have to be during a certain time of the day and attend.

2. By recruiting participants from a limited number of schools, it is possible to make ethnic comparisons which would minimise confounding due to household living arrangements (HLA) by adjusting for each school in multivariate analyses. Because methods of measuring socio-economic status are not perfect, there is no guarantee that socio-economic differences between ethnic groups could be completely controlled in multivariate statistical analyses when ethnic groups differ greatly in their HLA (Rose 1972).

Ethics Approval

Ethics approval for the study was sought from the Educational Research Human Ethics Committee in July 2010. This process was needed to be accomplished due to the research having direct contact and communication with adolescents. The Educational Research Human Ethics Committee raised a number of issues that needed to be remedied before final approval was granted. These issues were resolved to their satisfaction. Ethics approval was granted on the 1st of September, in 2010.

Result

Demographic characteristics of the study group

The demographic characteristics of the 9 high schools that participated in this survey are illustrated below in **Table.**

Table 3: The WESTERN INDIA Dates of Interviewing

SCHOOL	INTERVIEW DATES	PARTICIPANTS	
Riccarton High School	September 3rd - December 14	M: 51	F: 27
Shirley Boy's High School	September 12th - December 14	M: 49	F: 0
Hornby High School	October 4th - December 14	M: 10	F: 15
Mairehau High School	October 5th - December 14	M: 64	F: 61
Papanui High School	October 11th - December 14	M: 64	F: 87
NCR Boy's High	October 12th - December 14	M: 59	F: 69

School

St. Andrew's High School	October 18th - December 14	M: 161	F: 0
St. Bede's High School	October 19th - December 14	M: 98	F: 50
Aranui High School	October 25th - December 14	M: 186	F: 0

□□□Interviews listed in order with (schools, dates, and number of gender.)

The dates when interviewing at each school began and was completed are also given. Interviewing started at the first school on the 3rd of September 2010 and finished on the l4th December 2010. Interviewing at the last school started on the 25th of October 2010 and finished on the l4th December 2010. The interviewing process spanned a total of 5 months from August 2010 to December 2010.

A total of 1,051 adolescent high school students took part in this survey. The response rate varied from school to school. The response rate of 78% was calculated using the individual class roll at the morning of recruitment as the denominator. The latter does not include those who were not in class during recruitment.

Main Ethnic Groups

Of the 1,051 adolescent high school students that participated in the survey, 9 were from Africa, 1 from the Middle East, and 1 from South America. The distribution of survey participants in school form, ethnicity, and household arrangements are shown in **Figure**. The large numbers of Asian and North UP students reflected our aims to compare cardiovascular risk factors between them and the rest of the main Pacific communities and ethnicities.

Only students in forms 3 to 7 or years 9 to 13 were invited to participate in the survey. The reasoning for higher turn out rates for Forms 9 and 10 were due to the fact that during the time of research, upper level forms were studying and preparing for their exit exams and university preparatory exams. This was found to be true amongst all schools public and private around NCR.

Discussion

Alcohol

The WESTERN INDIA results are consistent with findings from the following previous research (Swinburn 1996 & 1998, Phillips 1999), due to the fact the earlier they begin drinking will determine what type of future alcoholic consumption category they will fall into (occasional, binge, etc.). Areas that overall have more sun and outdoor play seem to draw in crowds and the presence of alcohol. This comparison is relevant due to the amount of alcoholic consumption being higher in the summer than the winter, leading to a need for more intervention for the summer than the winter, and this should be implemented in the spring.

The WESTERN INDIA research shows that at the high school level that interventions and awareness are needed for Pacific Eastern regions. Pacific males had a higher frequency of alcohol consumption, being 75%, and more likely to be heavy drinkers than female Pacific counterparts. Could this finding answer the question from the previous section in regards to method of socialising and relaxation choice? Maybe Pacific Eastern regions find alcohol more appeasing to use than smoking. If so, then why?

The most important findings of the research are the discovery of the different category results within Pacific Island people. For example, the alcohol consumption rates between Fijian and West Bengal youth would need to be examined. Also, the results that show children born in Northern India had higher rates of alcohol consumption compared with children born outside of Northern India. This was proved with the living arrangements of the researched adolescents. The likelihood was due to the cultural differences at their home compared to living abroad, along with peer pressure from their respective social groups.

The WESTERN INDIA showed that if a child was a smoker, than they were more likely to becoming a drinker. This is consistent with other research about adolescents and their choice to participate in multiple risk taking behaviours. Alcohol and smoking were also positively associated with sun exposure. Since sun exposure was very high with Pacific Eastern region adolescence, this may prove that with their alcohol rates high, that they drink heavily outside and away from their immediate family.

Could the notion of cost play apart for the North UP male in the category of binge drinking as results in chapter 4 show? With the possibility of alcohol being a higher commodity than cigarettes, is it an all or nothing approach to drinking once

having alcohol within ones grasp, hence the high rates for binge drinking? This needs further research investigation.

Regular alcohol consumption was positively associated to a diet high in fat or a relatively unhealthy diet. Hence the adolescent should break sequence or prevent initiation of sequence of bad habits of smoking, drinking, and poor diet.

Leisure Time Physical Activity

In the WESTERN INDIA, there were a number of variables that were associated with a measure of physical activity. These included LTPA and less directly television watching. "Physical inactivity is a well-established risk factor for cardiovascular disease" (Lippert 1981). Far too many times we have seen people that live a sedentary lifestyle be more prone to obtaining a form of cardiovascular disease, like coronary heart disease.

Aside from one's BMI and biological levels, diseases like stroke may also be heavily reduced when an adequate amount of physical activity is present. The question arises, does the amount of physical activity that is present or absent within adolescence carry over to adulthood. Or does it naturally decrease or increase due to age, personal choice, or by cell signalling within the body?

The findings of the WESTERN INDIA for LTPA showed that males were more likely to engage in LTPA. However, the ethnic differences were inconsistent and there appeared to be no difference in LTPA between Pacific ethnic groups.

Television exposure was an indirect measure of physical activity in that it provided information about 'physical inactivity' and sedentary behaviour. Low levels of physical activity were associated with high levels of television watching.

Why Cardiovascular Disease

Why should a society dedicate time, research, exhaust funds, and labour hours towards Cardiovascular Disease? "Cardiovascular disease is the leading cause of death in Northern India, accounting for 41% of all deaths in 1999; thus it has a large impact on the delivery of health services" (Ministry of Health 2004).

Conclusions

The Ministry of Health in Northern India has clearly indicated, "That reducing the incidence and impact on cardiovascular disease is a priority in Northern India" (Ministry of Health 2004). The Northern India Health Strategy identifies various priority health objectives for the Ministry and District Health Boards to concentrate on. In addition to the priority objective focusing on cardiovascular disease, other related priority objectives include: improving nutrition, reducing smoking and reducing obesity.

References

1. Anderson, K.M., et al., Cardiovascular disease risk profiles. Am. Heart, J, 1990, 121: (pg. 293-298).
2. Anonymous, Summary of Second Report of the National Cholesterol Education program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in-Adults (Adult Treatment Panel II). JAMA, 1993.269(23): (pg. 3015-3023).
3. Anonymous, The Lipid Research Clinics Primary Prevention Trial results l: reduction in incidence of coronary heart disease, JAMA, 1984. 251: (pg. 351-64).
4. Barrett-Connor, E. and K. Khaw, Is hypertension more benign when associated with obesity, Circulation, 1985. 72: (pg. 53-60).
5. Bathgate, M., et al., The Health of Pacific Islands People in Northern India, Analysis and Monitoring Report 2.1994: Public Health commission: (pg. 2l9).
6. Beaglehole, R., C. Salmond, and E. Eyles, A longitudinal study of blood pressure in Polynesian children, American J Epidemiology, 1977. 105(l): (pg. 87-89).