FACULTY OF MEDICINE AND HEALTH SCIENCE
UNIVERSITI MALAYSIA SARAWAK

A STUDY ON THE PREVALENCE OF HYPERTENSION AND FACTORS AFFECTING IT AMONG ADULTS AGED 25 AND ABOVE AT NANGA SELAUT AND NANGA SEBIRAH IN JULAU DISTRICT, 19 JUNE TO 5 AUGUST 2000: A Cross-sectional Study

Research Report by:

Azizul Idris
Chang Li Kuin
Arlina Nuruddin
Chai Chiun Hian
Lee Chun Cheng
Natalia Che Ishak
Yeoh Cheng Wooi
Rosidah Shahbodin
Siti Nawal Mahmood
Sy. Norashikin Wan Ahmad

Year 4 Medical Students
21 June-5 August 2000

DECLARATION

We declare that this research originates from our own effort, except for certain facts and citations with which the sources have been clearly listed in the bibliography.

Azizul Idris (001012)
Chang Li Kuin (001740)
Arlina Nuruddin (002290)
Chai Chiun Hian (001749)
Lee Chun Cheng (001747)
Natalia Che Ishak (001263)
Yeoh Cheng Wooi (001755)
Rosidah Shahbodin (002003)
Siti Nawal Mahmood (001382)
Sy. Norashikin Wan Ahmad (001386)

1st August 2000

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ABSTRAK

Hipertensi ialah penyakit kardiovaskular yang paling biasa ditemui dan dianggap sebagai cabaran kesihatan awam kepada masyarakat yang sedang berada di transisi sosioekonomi dan epidemiologi. Penyakit ini dianggap sebagai salah satu punca penting kematian akibat penyakit kardiovascular dengan mencatatkan 20-50% kematian. Satu kajian keratan rentas ke atas prevalens hipertensi di kalangan penduduk berumur 25 tahun ke atas dan faktor-faktor yang mempengaruhinya telah dijalankan di Julau, iaitu di Rumah Changgan dan Rumah Selan di Nanga Selaut serta Rumah Luke Lipa di Nanga Sebirah. Seramai 115 responden telah dipilih secara universal. Temuramah dan pengukuran tekanan darah serta indeks jisim tubuh telah dilakukan ke atas setiap responden. Hasil kajian menunjukkan kadar prevalens hipertensi sebanyak 61.7%; kaum lelaki mencatatkan 69.6% manakala kaum perempuan pula 56.5%. Kajian juga menunjukkan kaitan yang signifikan di antara kadar prevalens dengan umur, tahap pendidikan, pekerjaan dan indeks jisim tubuh tetapi faktor yang gagal menunjukkan perkaitan signifikan termasuklah sejarah keluarga yang positif, merokok, pemakanan garam serta alkohol yang berlebihan. Tahap pengetahuan keseluruhan tentang hipertensi di kalangan responden adalah amat rendah, iaitu 61.7%, manakala pengetahuan responden dari segi faktor-faktor risiko serta tanda-tanda hipertensi secara amnya adalah bagus, masing-masing mencatatkan 67.0% dan 61.7%. Bagaimanapun, 68.7% responden menunjukkan ketidakcukupan pengetahuan dari aspek komplikasi penyakit hypertensi. Pengetahuan tentang tanda-tanda hipertensi menunjukkan hubungan bermakna dangan prevalens hipertensi ($p<0.05$), tetapi, aspek-aspek lain yang dikaji tidak menunjukkan sebarang hubungan bermakna ($p>0.05$). Walaupun sebanyak 113 (98.3%) responden mempunyai sikap dan amalan yang memuaskan, tetapi ia juga tidak memaparkan hubung kait yang bermakna dari segi statistik dengan prevalens hipertensi ($p>0.05$).

ABSTRACT

Hypertension is so far the commonest cardiovascular disorder, posing a major public health challenge to societies in socioeconomic and epidemiological transition. It is one of the major risk factors for cardiovascular mortality, which accounts for 20-50% of all deaths. A cross-sectional study on the prevalence of hypertension amongst residents aged 25 and above and factors affecting it was carried out in Rumah Changgan and Rumah Selan of Nanga Selaut and Rumah Luke Lipa of Nanga Sebirah in Julau. A total of 115 respondents were universally selected for the questionnaire interview and measurements of both blood pressure and body mass index. The overall prevalence of hypertension was found to be 61.7% with 69.6% of men and 56.5% of women were found to be hypertensive. Significant associations between age, educational level, occupation and body mass index with the prevalence of hypertension were found. Nevertheless, there was no statistically significant link between the prevalence of hypertension and positive family history, smoking, excessive dietary salt and alcohol intake. The overall knowledge on hypertension amongst the respondents is poor that 61.7% were proved to have inadequate knowledge. Knowledge of the respondents on risk factors and signs and symptoms of hypertension are generally good (67.0% and 61.7% respectively). Nevertheless, knowledge on complications of hypertension had shown 68.7% of inadequacy among the respondents. The knowledge on signs and symptoms of hypertension is significantly associated with the prevalence of hypertension ($p<0.05$), however, this is not true for other aspects of hypertension ($p>0.05$). Although majority of the respondents (113 or 98.3%) has good attitude and practice towards hypertension, it was found not to be statically significant with the prevalence of hypertension as well ($p>0.05$).

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Chapter I

INTRODUCTION

1.1 Background of Julau District

Sarikei is one of the divisions in Sarawak, the land of hornbill. The division is further subdivided into 5 districts and is criss-crossed by numerous rivers that originate from steep mountains in some interior areas like Julau and Pakan.

The geographical features have a profound effect on our health care system. The road system in Julau District is only well-developed in big towns like Julau, Pakan and part of Nanga Wak area. Rivers form an important means of communication for the people of Julau, but to reach a very remote area is by means of foot.

Most of the residents in Julau district live in longhouses which are made of smaller rooms or *bilik* where different families live in. In front of the *bilik* is a spacious covered veranda called *ruai,* where most of the social activities can be carried out. If the longhouse is situated next to a river, it will be coined as *Nanga (Ng)*.

The population of Julau District is 31,142. The majority are farmers whilst a small number working at logging stations and labour sites in Sarikei town. Common plantations include pepper, rubber and cocoa.

Klinik Kesihatan is available in Julau, Pakan, Entaih, Ng Wak, Entabai and Lassi. There are only *Klinik Desa* in Ensiring, Maong, Kara and Ng Sekalong. Every *Klinik Kesihatan* has a Village Health Team (VHT) that covers their longhouses in their

respective operational area. The operational area of this Klinik Desa is covered by VHT from other clinics every 3 monthly and Flying Doctor Service (FDS) on monthly basis.

1.2 Background of the Longhouses in Ng Selaut and Ng Sebirah

Ng Selaut consists of three longhouses namely Rh Entinggi, Rh Selan and Rh Changgan. For the purpose of our research, only Rh Selan and Rh Changgan will be studied.

Rumah Changgan has a total of 42-door longhouses which are separated into several shorter longhouses. In 1978, all of the doors were continuous. But due to infrastructure development and several conflicts, the longhouses had to be separated into smaller longhouses. Some of the rooms were separated from the main longhouse and has become a detached unit until now. Currently, the head of the longhouse or *tuai rumah* is Mr. Changgan ak Layang.

Rumah Selan is headed by Mr Selan ak Kapal who has been the present *tuai rumah* since the seventies. Rh Selan was built in the present place since 1985 to accommodate more residents. According to the tuai rumah, their ancestors had been staying in that area since the reign of Rajah Brooke. Currently, there are 35 doors with a population of 143 people. All of the occupants are Ibans and majority of them is farmers. The longhouse is fully equipped with basic amenities. There is a tarred road leading to the longhouse from the main Julau road. Sungai Kanowit is located nearby.

Besides those two longhouses from Ng Selaut, the research will also be conducted in Ng Sebirah which is situated nearby. Ng Sebirah consists of one long-house which is known as Rh Luke Lipa. Rh Luke Lipa is a relatively new longhouse which is built in the

1985. It is built just next to the Julau Road as most of the residents there work in the government sector. The longhouse is headed by Mr Luke Lipa. It has 16 doors but currently only 9 doors are occupied.

A census carried out by us on 21 June 2000 found out that Rh Changgan has a total population of 141 people. Out of this, 36.2% (51 person) is aged more than 25 years old. All of them are Iban.

In Rh Selan, there is a total of 143 people. Out of this, 37.1% (53 person) is aged 25 years and above. Rh Luke Lipa has a total of 40 residents. There are 11 persons aged 25 years and above (27.5%). Almost all of them are Iban and only a few are Bidayuh.

Chapter II

STATEMENT OF PROBLEM AND LITERATURE REVIEW

2.1 Statement of Problem

During our first visit to Ng Sebirah and Ng Selaut on 20 June 2000, the 3 respective *tuai rumah* unanimously voiced their concern on the relatively high prevalence of hypertension amongst their residents. Other topics which are deemed as important to them are acute respiratory infections and rheumatism.

Of the three topics mentioned above, hypertension is identified as the most serious problem and the most prioritised disease by the longhouse community. Thus, we have decided to carry out a research study on hypertension in the above named areas.

Julau has a high number of new cases of hypertension for the past few years. According to the health personnel at *Pusat Kesihatan Julau*, the number of new cases recorded in 1999 was 73 (31 male and 42 female) whereas during the first five months of this year, 49 new cases were diagnosed.

During our pilot study in Ng Selaut and Ng Sebirah, we found out that there are 19, 22 and 5 known cases of hypertension in Rh Changgan, Rh Selan and Rh Lipa respectively. This indicates that 46 out of 114 (40.35%) residents aged 25 and above have hypertension. It is highly anticipated that more cases will be uncovered.

Table 2.1: Number of New Cases of Hypertension Reported At Klinik Kesihatan Julau from January to May, 2000.

New cases of hypertension (2000)	Male	Female	Total
January	5	6	11
February	6	5	11
March	3	5	8
April	3	6	9
May	6	4	10
Total	23	26	49

Source: Outpatient Department Record, Pusat Kesihatan Julau.

Patients with hypertension are at risk of cardiovascular diseases, which is a major health problem not only in the developed countries but also in developing countries like Malaysia. The higher the arterial pressure the greater is the risk of coronary heart disease (Dawber *et al*, 1962). Elevated blood pressure has also been repeatedly shown to be among the leading 'risk factor' for the development of cerebrovascular accidents (Kannel, Schwartz & McNamara, 1969; Gordon & Kannel, 1972). Since many cases of stroke can be prevented if hypertension is treated with great vigour and attention, control of elevated blood pressure has contributed to the reduction in morbidity and mortality from stroke and coronary heart disease (Hypertension Consensus Committee Working Group, 1998).

Therefore, it is important that the potential hypertensives in Ng Selaut and Ng Sebirah are identified promptly as early detection and intervention will decrease the possibility of morbidity and mortality resulting from Target Organ Damage (TOD). This in turn will contribute to the reduction of government's financial burden.

During our discussion with the villagers of Ng Sebirah and Ng Selaut, it is found that they are very inquisitive about the problem and hope that something can be done to overcome the situation. According to them, though there is an Outpatient Department that deals with this disease, programs involving educational and awareness-raising intervention have never been carried out in their areas. In addition, there has been only a few community-based studies on hypertension in Malaysia and amongst Ibans. Hence, a research study and intervention will be carried out from 21st to 22nd July. Hopefully it will serve as a reference baseline for future studies

Hypertension is a modifiable disease and is often related to multiple risk factors. The factors concerned encompass smoking, alcohol intake, increased salt intake, cholesterol and saturated fat intake, obesity, lack of exercise and stress. All of these, if not some, might be responsible for the high prevalence of hypertension among the natives in Ng Selaut and Ng Sebirah. Hence, it is imperative for us to discover the predisposing factors at play and to improve the knowledge, attitude and practice towards hypertension which in turn subsequently reduce the incidence of the disease.

Since the three longhouses that will be surveyed are relatively modernised, it is possible that from the anthropological point of view, hypertension in these villagers may be due to changes in habitual physical activity and the composition of diet similar to the affluent people today (Blackburn and Prineas, 1983). Thus, with the passage of time, as more and more longhouses are ushering into the modernised world, similar problem may be anticipated. This warrants early detection of new cases to prevent TOD and more importantly early prevention at the community level.

In conclusion, the summary of our statement of problem is as follows:

- Main interest of the residents is hypertension.
- High prevalence of hypertension among the long-house occupants.
- No previous studies, educational or intervention programs in the area.
- Early detection among residents is warranted to prevent ultimate target organ damage.
- Hypertension is a modifiable disease.
- Since these longhouses are modernised, there is probably a relationship between changes into affluent lifestyle, which lead to the increase in hypertensive cases.

2.2 Literature Review

(i) Introduction

Blood pressure in the general population is a continuum. The distinction between normotension and hypertension is based on epidemiological observation. In a general population, the distribution of blood pressure follows a Gaussian distribution as shown in the figure 2.1 (Hypertension Consensus Committee Working Group, 1998).

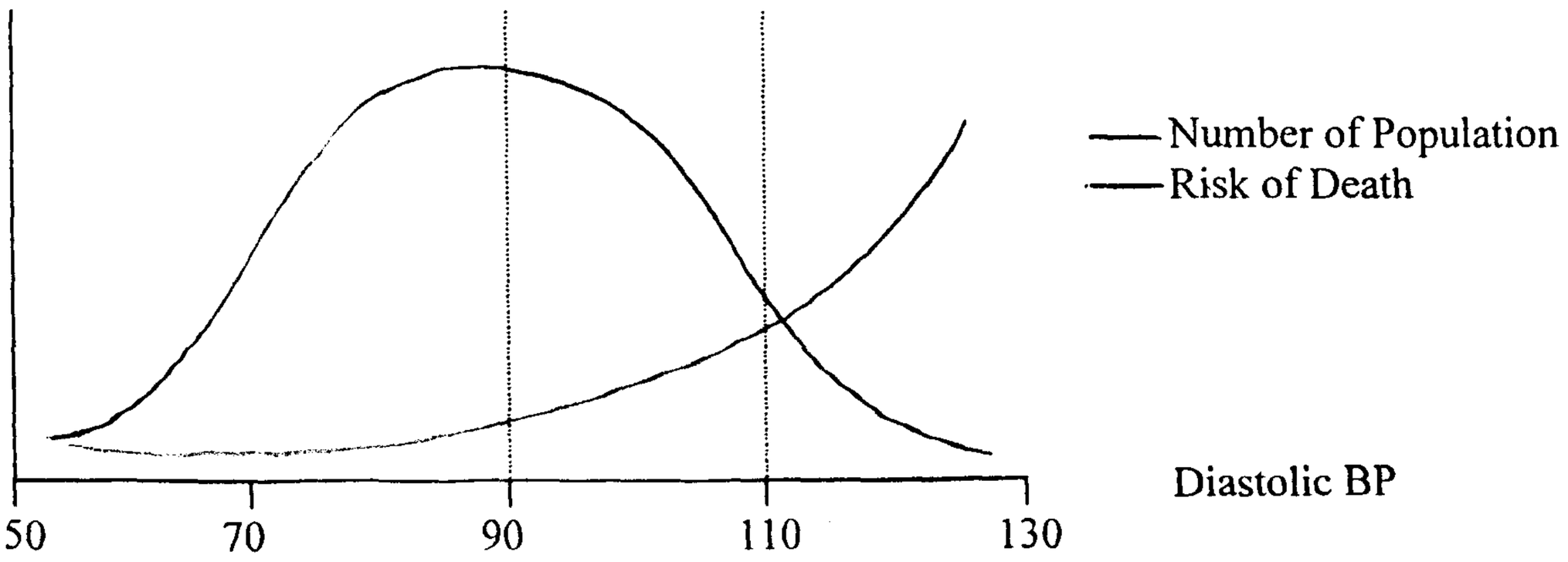

Figure 2.1 Distribution of Diastolic Blood Pressure in a Western Population
(Adapted from Souhami , Moxham J. Textbook of Medicine 2nd edition 1994 p. 429-438)

Various authorities, including the World Health Organisation/International Society of Hypertension (WHO/ISH) and The Joint National Committee on the Detection, Evaluation and Treatment of High Blood Pressure (JNC) have reviewed the definition of hypertension. The definition and classification of high blood pressure is illustrated in the table below (Table 2.2) and is adopted from the Fifth Report of the JNC.

Table 2.2: Classification of Blood Pressure for Adults Aged 18 Years and Older

Category	Systolic (mmHg)	Diastolic (mmHg)
Normal	< 130	<85
High Normal	130-139	85-89
Hypertension		
Stage 1 (mild)	140-159	90-99
Stage 2 (moderate)	160-179	100-109
Stage 3 (severe)	180-209	110-119
Stage 4 (very severe)	>210	>120

(Adapted from the Fifth Report of the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure (JNC V), Archive of Internal Medicine 1993; 153; 154-183.)

Compared to the traditional classification, the new classification provides information about the impact on risk. High-normal blood pressure indicates an increased risk of developing definite high blood pressure, and risk of experiencing non-fatal and fatal cardiovascular events, compared with otherwise similar persons with lower blood pressures. All stages of hypertension are associated with increased risk of non-fatal and fatal CVD events, stroke and renal disease. The higher the blood pressure, the greater is the risk. Stage 1 Hypertension is the commonest form of high blood pressure in the adult population and is responsible for a large proportion of the morbidity and mortality associated with hypertension (Malaysian Hypertension Consensus Guidelines 1998).

(ii) Overview of the Prevalence of Hypertension

The prevalence of hypertension in the adult population found at screening ranges from 15-25%. This is substantiated by a study done by the WHO Expert Committee on Arterial Hypertension which shows that 8-18% of the adult population in most countries have hypertension (World Health Organisation Expert Committee, 1978).

In Malaysia, a recent survey (the National Health and Morbidity Survey II) indicated a prevalence of 24%. Liew *et al* showed that the frequency of hypertension based on 140/90 mmHg as cut off value varies from 10.3 –25.6% with a mean of 16%. A smaller scaled study shows even higher prevalence of hypertension: Based on a study carried out on the prevalence of hypertension amongst rural Malays living in two villages in Kuala Selangor district, simple random sampling of households was carried out and all members 15 years and above were examined. Out of 359 persons examined, 92 (25.6%) had hypertension. A significant increase in prevalence was also observed with increasing age and in smokers (Osman Ali, Rampal, K.G. & Syarif Hussin Lubis, 1980). Other studies in Malaysia also showed high prevalence of hypertension among the Malays, ranging from 14.7% (Kandiah, Rampal, Paranjothy & Gill, 1980) to 25% (Volp, 1976).

(iii) Risk Factors of Hypertension

Hypertension is a multifactorial disease. In 95% of the cases, the cause is unknown ('essential'). Causes in the remaining 5% include renal diseases (renal artery stenosis, polycystic kidney diseases, chronic pyelonephritis, etc.), endocrine diseases (Cushing's and Conn's Syndrome, acromegaly, hyperparathyroidism, diabetic mellitus, etc.) and other causes such as coarctation and pre-eclampsia. Numerous researchers try to elucidate the

possible relationships between various causes or rather risk factors with hypertension. The risk factors can be divided to two categories: modifiable and non-modifiable risk factors (Kumar & Clark, 1998).

- Age - Except in some isolated traditional communities (e.g. in Papua New Guinea and some pacific islands), there is a generally increasing prevalence at higher age-groups (Phoon & Chen, 1986). Mean blood-pressure levels are also known to be higher at succeeding decades of age. This is consistence with a study conducted by Osman Ali, KG Rampal and SF Lubis (1980) among the Malays in Kuala Selangor. The results revealed that the elderly (aged 65 and above) had the highest percentage of prevalence (55.9%) compared with the other age groups: 37.9% for age group 35-44, 8.9% for 25-34, and 5.3% for 15-24.
- Gender – While there is a male predominance among the younger adults, most communities report a narrowing of the sex difference after 50 years of age. However, post-menopausal women sometimes show a higher mean blood pressure levels and prevalence of hypertension than men of the same age due to hormonal changes and selective mortality among elderly males (Phoon and Chen, 1986). Though the prevalence is higher in men than in women, 28.4% compared to 23.7%, Rampal in the his study fails to show any significance between the variables.
- Ethnicity – In the USA, blacks tend to have higher prevalence compared to the whites. In Malaysia, Malays have the highest prevalence (14.7%) followed by Chinese (14.5%) and Indians (10.8%), although there is no significant difference between each ethnic group. Similar results are shown by Volp (1976) and Ooi, Tan & Charles (1972).

- Heredity – There is a higher risk of developing hypertension among monozygotic twins and first-degree relatives (Phoon and Chen, 1986). This could be the reason why it is impossible to achieve normal blood pressures in 50% of patients and hence the inability to fully reverse the cardiac and vascular changes that predate the diagnosis and treatment of hypertension (MJ Morris, 1997).
- Socioeconomic status – According to Kandiah, *et al* (1980) in his study on the epidemiology of hypertension in Selangor, there was a higher rate of hypertension in the urban areas (16.8%) in comparison with the rural areas (12.3%). However, there was no significant difference at 95% confidence level in these two prevalences. Nevertheless, the urban dwellers seem to be more susceptible as there are studies which prove this statement, i.e. 20.2% of the population in Singapore had blood pressure of more than 150/90 mmHg. This shows that the prevalence rate of hypertension in Singapore is higher than in Malaysia.
- Excessive salt intake – Comparative studies between different populations have shown a strong correlation between high salt intake and increasing blood pressure with age. In some parts of Japan with mean daily intake of 20g salt per head, prevalence of hypertension is among the highest in the world (Sasaki, 1977 & Joosens, 1980).
- Obesity and Physical Activity – Morris *et al* in 1953 showed that myocardial infarction was more common among bus drivers and post office clerks who have sedentary jobs as compared to conductors and postmen, who led comparatively more active jobs. Rampal *et al* agrees by stating that of the majority of the respondents (844) who were taking moderate/light activity, 14.7% of them had hypertension whereas among those

with heavy activity (85), only 3.5% had hypertension. Obese children have higher average pressures and more 'hypertension' than the non-obese (Court *et al*, 1974).

- Smoking – There were significantly more hypertensives among smokers than non-smokers. Out of 277 smokers, 50 (18.1%) had hypertension while only 85 (12.4%) of the 686 non-smokers had hypertension (Osman Ali *et al*, 1980). Doll and Hill (1976) have shown that the greater the number of cigarettes smoked per day, the greater is the risk of myocardial infarction.
- Alcohol intake – Clinical, experimental and population studies suggest a strong association between alcohol use, blood pressure and hypertension. A study by Wallace *et al* in 1981 further justifies this by finding a consistently higher prevalence of hypertension in heavy drinkers versus light users of alcohol with ratios in the order of two.
- Stress – It is well known that Type A personality is associated with hypertension and relatively higher risk of mortality. Though chronic stress has been mentioned as a possible factor, it is difficult to measure and assess such an influence.

(iv) Signs and Symptoms

Considering the percentage distribution of hypertensives by symptoms, 23.4% have eyesight problems and 11.9% with such problems had hypertension, 22.0% with pain in calves and 12.5% without pain in calves had hypertension. 19.4% with headache and giddiness and 11.4% without such complaints had hypertension (Osman Ali *et al*, 1980). Using the Chi-square test of significance, the symptoms of headache and giddiness,

eyesight problems and pain in calves were found to be significantly more common in hypertensives than normotensives.

(v) Complications of Hypertension

Cerebrovascular disease and coronary artery disease are the most common causes of death in hypertension, although these patients are also prone to renal failure and peripheral vascular disease

In the Framingham study, hypertensives had a six-fold increase in stroke compared with normotensives. This was due to both cerebral haemorrhage (pressure-related) and infarction (atheroma-related). In the same study, there was a three-fold increase in cardiac death due either to coronary events or to cardiac failure). Peripheral artery disease is twice as common in hypertensives.

In addition, MacMahon and colleagues conducted a pooled analysis of nine prospective observational studies with 418,343 participants aged 25 to 84 years. None of the study participants had clinical evidence of coronary heart disease or stroke at baseline, and they were followed for an average of 10 years. The combined results demonstrated a positive, continuous and independent association between blood pressure and the incidence of coronary heart disease and stroke.

Table 2.3: Manifestations of Target Organ Damage

Organ System	Manifestations
Cardiac	Left Ventricular Hypertrophy, Coronary Artery Disease, Heart Failure
Cerebrovascular	Transient Ischaemic Attack or Stroke
Peripheral vascular	Absence of 1 or more major pulses in extremities (except for dorsalis pedis) with or without intermittent claudication; aneurysm
Renal	Raised serum creatinine; microalbuminuria (1+ or greater)
Retinopathy	Haemorrhages with exudates, with or without papilloedema

(Adapted from the Fifth Report of the Joint National Committee on Detection, Evaluation and treatment of High Blood Pressure (JNC V). Arch Intern Med 1993 Vol. 153: 154-183.)

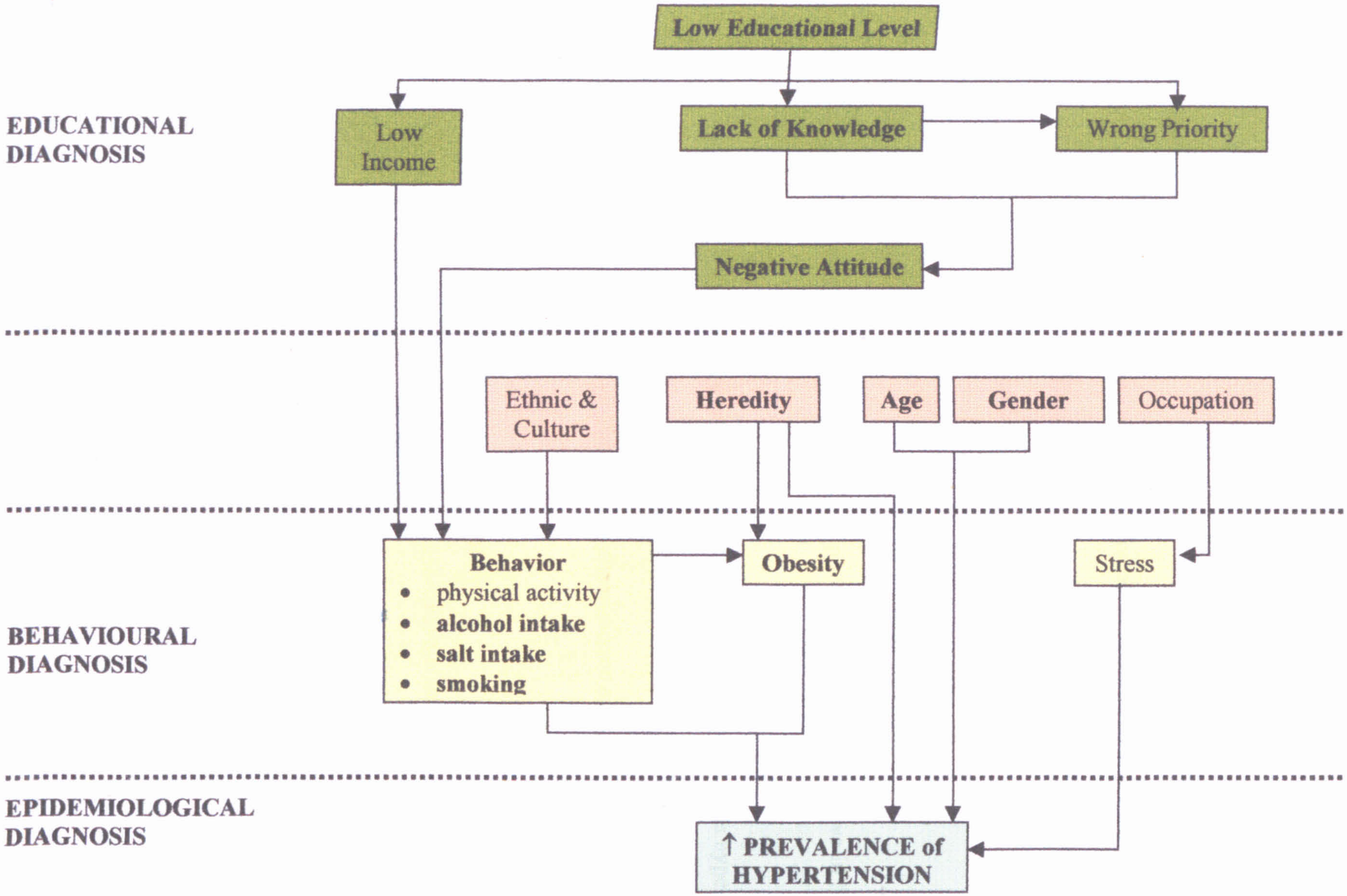

Figure 2.2 Problem Network