Teaching the Teacher:
A WHO/WHL* Cross-Cultural Project for Training Health Personnel in Methods of Patient Education for Hypertension

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on behalf of WHO/WHL Patient Education Principal Investigators[3]

Background The WHO/WHL Patient Education Project (PEP) was a 3-year multinational cross-cultural study of the training of health personnel in methods of patient education for hypertension.

Design and Methods The study evaluated the applicability and effectiveness of models for patient education in various sociocultural settings. The study included 1,197 adult hypertensive patients, at baseline, of all ages and both genders, 61 physicians, 31 nurses, and 18 allied health workers from the participating clinics. They were assigned either to the educational group or the routine group in pilot centers from six countries, developed and developing, in five WHO regions. The data collected comprised patient identification, patient/health personnel interrelation and satisfaction, quality of hypertension care, compliance with medical prescriptions, measurement of relevant variables, and problems and solutions during the study period.

Results It shows how the staff at the primary health care level can be reached and trained to deliver patient education, through collaboration with scientific/university hospital-based services in countries at different stages of development.

Conclusion Patient education, as applied in this study, provides a cost-effective way of improving the quality of care and patient adherence to long-term treatment, not only for hypertension, but also for other cardiovascular and chronic noncommunicable diseases. The PEP strategy is applicable in various socioeconomic and cultural settings and in different health care delivery systems. (***CVD Prevention*** **1999; 2:58–72**)

Key Words • hypertension • patient education • quality of care • multinational study

Introduction

Background

Cardiovascular diseases (CVDs), most of which are due to atherosclerosis (mainly heart attack and stroke) and are often related to arterial hypertension, are responsible for almost 30% of all deaths worldwide (at least 15 million/year). They are the principal cause of death in all developed countries, accounting for 50% of all deaths, and are also emerging as a prominent public health problem in developing countries, accounting for almost 25% of all deaths.[1]

Arterial hypertension is the most common CVD and is a major public health problem in both developed and developing countries, affecting about 20% of the adult population. It has a marked effect on patients, their relatives and society, both in itself and because of its complications (stroke, heart attack, ischemic heart disease, renal dysfunction, and heart failure) which can cause premature death or permanent disability. The risk of developing complications of hypertension is substantially increased by the presence and seriousness of other CVD risk factors, such as hypercholesterolemia and dyslipidemia, smoking, central obesity, and diabetes.[2,3]

Epidemiological studies show that there are significant geographical differences in the occurrence of arterial hypertension and its complications both

*WHO = World Health Organization; WHL = World Hypertension League.

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between and within countries; these studies also show that there are several factors which play an important role in the development, evolution, and prognosis of arterial hypertension, some of them nonmodifiable (such as age, sex, ethnicity, and heredity) and others modifiable (such as body weight, salt intake, alcohol intake, use of hormonal contraceptives and drugs retaining sodium, a sedentary lifestyle, and psychosocial factors).[2,3]

Over the last 30 years, considerable advances have been made in the pharmacological[2,4] and nonpharmacological[2,5] treatment of hypertension. Multicenter studies of community control of arterial hypertension, covering both developed and developing countries, have shown large increases in the percentage of hypertensive people who are aware of their disease and under treatment, and whose blood pressure is controlled. However, in many countries, awareness of hypertension and the level of treatment remain relatively low. Often, only half of all hypertensive individuals, or even less, are aware of their condition, half or less of known hypertensive people are under treatment, and usually only half or less of treated hypertensive people have adequate blood pressure control.[2,3,6–16]

Philosophy and History of the WHO/WHL Patient Education Project (PEP)[3]

There are three major impediments to overall improvement in hypertension control:

- lack of awareness of hypertension
- poor adherence to treatment in patients identified as hypertensive
- economic constraints in low income countries and in the low income and uninsured population of developed countries, which limit availability, accessibility, and continuity of care

PEP concentrated on the second major impediment: poor adherence to treatment regimes.

Control of hypertension, like that of many other chronic diseases, depends on the natural history of the disease and its epidemiology, on physicians and allied health workers, on the availability of drugs, and on the patients themselves. Obviously, the patient is the crucial factor, yet there is a general tendency to ignore or underestimate his/her role in the therapeutic process. This seems to not be the fault of hypertensive patients themselves, who are, in general, concerned about their disease once it has been diagnosed. The problem lies more with health professionals, who often fail to establish productive and stimulating relationships with their hypertensive patients.

Realizing this deficiency, the World Hypertension League (WHL), held a workshop on the subject entitled, "Educating the Hypertensive Patient—Teaching the Teacher."[6] At this workshop, a manual[17] entitled *Educating the Hypertensive Patient* was developed under the leadership of T. Strasser and U. Grueninger.

The study was not aimed at the disease, nor at the patients themselves; instead, it aimed to find the best methods, in a given society and culture, to achieve full cooperation between the health professions and patients in the control of hypertension.

The philosophy of the project was as follows: active participation of the patient is an important component of the therapeutic process. Patients can (and should) be educated to take an active part in the management of their disease. However, education of the patient requires special skills and knowledge; these should first be taught to the prospective educator. The process of communicating with patients and the mechanisms for educating them should be understood, first of all, by the physician, whether or not the actual process of educating the patient will be delegated to other health workers.[3,16,18–20]

At an initial workshop on "Teaching the Teacher" (TTT), held in Geneva in 1991, the principal investigators (PIs) were trained in methods of patient education, in the TTT principle (interactive discussions, demonstration of videotapes and discussion of teaching aids, use of the manual, and other educational materials). After the consultation, the PI of each center wrote a draft plan of operation for the study in his/her country and proposed a timetable for further action.

At a consultation held in Montreal on June 29, 1997, the PIs reviewed the final report of each center and the draft of the final report of the whole study and outlined a publication summarizing the study design, results, conclusions, and recommendations.

Objectives

The PEP objectives are as follows:

1. Training of health personnel in methods of patient education in order to improve the effectiveness of hypertensive patient care.
2. To develop models for patient education in various sociocultural settings, and to evaluate their effectiveness.
3. To institute, in various countries, training courses for health workers on methods for educat-

Table 1. WHO/WHL Patient Education Project (PEP) "Teaching the Teacher": A 3-Year Multinational Pilot Study

Participating Countries		
WHO Region	**Country**	**City/Province**
Africa (AFRO)	Ghana	Accra
Americas (AMRO)	Canada	Newfoundland
	Cuba	Havana
Europe (EURO)	Hungary	Budapest
South-East Asia (SEARO)	India	New Delhi
Western Pacific (WPRO)	PR China	Beijing

ing hypertensive patients (the "TTT" principle) and to evaluate the applicability and effectiveness of the methods.

Study Design

The pilot study was undertaken in six centers with different health care systems and sociocultural characteristics: Canada, China, Cuba, Ghana, Hungary, and India (Table 1). On the basis of the WHO/WHL PEP protocol,[3] each center wrote its own plan of operation, developing specific methodology to suit the local conditions (health care system and facilities for patient education).

All participating centers adopted common procedures. The local team included one or more physicians from a university or other scientific institution as PI, other physicians, nurses, and health workers from selected health clinics. Participating clinics were assigned at random to educational (E) or routine (R) status. Staff and patients of the E group received special education about hypertension (Fig. 1).

To qualify for participation in either group, a center had to have at least one well-structured outpatient clinic with medical, nursing, and clerical staff competent to cope with the additional workload caused by the project. In one center, where only a single clinic was involved and patients had to be randomized to the E or R group, patients from the two groups were seen on different days and by different physicians and nurses.

All patients diagnosed as having arterial hypertension qualified for inclusion in the project. Hypertension was defined on the basis of the 1993 WHO/International Society of Hypertension (ISH) Mild Hypertension Guidelines.[7] No upper blood pressure limits or age limits were set for enrollment. Patients were enrolled whether they were receiving drug treatment or nonpharmacological treatment (weight reduction, physical exercise, reduced salt and alcohol intake, relaxation techniques).

Sample size was based on a statistical estimate,[3] and a minimum of 60 patients in each group (E and R) and in each center was required. In fact, to allow for meaningful evaluation of a greater number of endpoints in each center, 80–100 patients/group was planned.

The WHO/ISH Mild Hypertension Guidelines[7] were used for hypertension diagnosis and treatment in both groups. Patients were not allowed to change from one group to the other. Questionnaires used were: patient inquiry, initial and final; patient examination, initial and final; follow-up examination and interim event record, at the end of the first and second year; and educational procedures for TTT and educating the patient (EP), at the end of the study.

Staff was trained to fill in the record forms properly.

Patients included in the project underwent an initial examination at the beginning of the study (initial patient inquiry and patient examination). Follow-up examinations took place every 3 to 4 months, and a yearly follow-up record was completed (follow-up examination and interim event record). A final examination took place at the end of the study (final patient inquiry and patient examination). These data provided information on the baseline, evolution, and final status of the patients. Data items included patient identification, history of hypertension, blood pressure, body height and weight, body mass index (BMI) and waist/hip ratio, smoking habits, treatment recommended and compliance with it, quality of care, date of follow-up visit and compliance with appointment, interim events/complications, and dropout. The questionnaire on the TTT and EP procedures was completed at the end of the study by the principal investigators.

Some centers included other optional measurements (ECG, urine analysis, echocardiogram, examination of the fundus of the eye) for the whole sample or for a subsample. Study duration varied between 18 and 36 months.

Educational Procedures

Procedures for TTT took the form of workshops, seminars, and/or a series of lectures with slides or transparencies. Three centers (Canada, Hungary, and India) used video presentations. Training included the following elements: study, discussion, and analysis of the manual Educating the Hypertensive Patient and other material related to hyper-

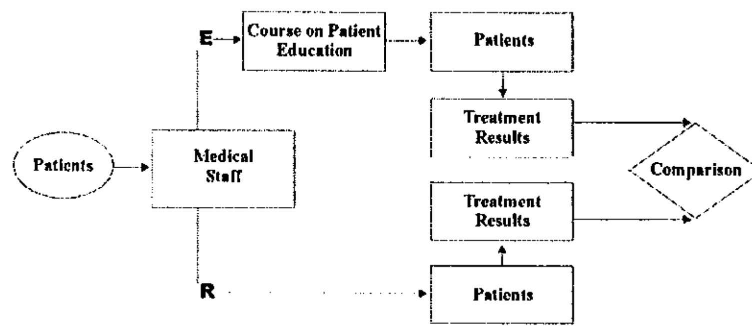

FIGURE 1. Study Design of Patient Education Project (PEP)—teaching the teacher (TTT).

tension control and prevention: individual and group counseling on pharmacological and nonpharmacological treatment, weight reduction, reduction of salt and alcohol intake, physical exercise, adherence to the prescribed medication, keeping appointments, and education about the disease, its complications, and the quality of blood pressure measurement. Topics also covered included reduction of other CVD risk factors (obesity, lipids, smoking, etc.), partnership with patients and their families, health education, and interpersonal communication. All centers distributed literature on hypertension control and health education and available scientific evidence. Canada and Hungary used audio/video methodology for improving and evaluating the training procedure. PIs were responsible for the TTT activities (Table 2).

Procedures for EP in all centers generally took the form of individual and group sessions, general lectures with slides in all centers, and video presentations in three countries (Canada, Hungary, and India). The educational procedures covered health education, general information about hypertension and its pharmacological and nonpharmacological treatment, advice on adverse effects of antihypertensive drugs, and advice designed to facilitate compliance with long-term treatment. Other approaches included general information on CVD

TABLE 2. Teaching the Teacher (TTT) Procedure

	Participating Center					
Procedure	**Canada**	**China**	**Cuba**	**Ghana**	**Hungary**	**India**
Staff						
Physicians	X	X	X	X	X	X
Nurses	X	X	X	X	X	X
Health workers	X	X	—	—	—	X
Public health nurse	X	—	—	X	—	—
Dietician	X	—	X	—	—	—
Health counsellor	X	—	—	—	—	X
Type of course						
Workshop/seminar	X	X	X	—[a]	X	X
Series of lectures	—	—	X	—	—	X
Tools						
Lectures	X	X	X	X	X	X
Slides/transparencies	X	X	X	X	X	X
Video presentations	X	—	—	—	X	X
Periodicity						
One	X[b]	X	—	—	—	—
2–5	X	X	—	—	—	—
5+	—	—	X	—	X	X
None	—	—	—	X[a]	—	—

[a] Self-education and further interactive education with principal investigators; [b] 1 week intensive training.

Table 3. Educating the Patients (EP) Procedure

Procedure	Participating Center					
	Canada	China	Cuba	Ghana	Hungary	India
Provider						
Physicians	X	X	X	X	X	X
Nurses	X	X	X	X	—	X
Health workers	X	X	—	—	—	X
Public health nurse	X	—	—	X	—	—
Dietician	X	—	X	—	—	—
Health counsellor	X	—	—	—	—	—
Educational activity						
Group sessions	X	X	X	X[a]	X	X
Individual sessions	X	—	X	X	—	X
Tools[b]						
Lectures	X	X	X	X	X	X
Slides/transparencies	X	X	X	—	X	X
Video presentations	X	—	—	—	X[c]	X
Frequency of group sessions						
Once a month	—	—	—	—	—	X
Up to 5/year	X	X	X	X	X	—
Selected days	—	—	—	—	—	X
Health education material available	X	X	X	X	X	X

[a] These were provided by a senior public health nurse, with the assistance of one Coprincipal investigator; [b] all were followed by an interactive discussion and some training activities; [c] sometimes these sessions were tape-recorded for further discussion.

risk factors and exchanges of experience between patients and their relatives. Health education material was given to patients in all centers. Physicians were responsible for EP procedures in all centers except Ghana, where a trained public health nurse was in charge. Canada used, in addition, public health nurses, a dietician, and a health counselor (Table 3).

Other specific procedures used were: cooking demonstrations (Canada and Cuba), the nurse strategy for facilitating the physician-nurse-patient interactive process (Ghana), training patients in self-measurement of blood pressure (Canada, Hungary, and China), and audio/video methods for improving and evaluating the training procedure (Canada and Hungary).

PEP methodology was integrated into the normal structure and facilities of the health institutions involved in the project. The health personnel and patients in the R group received no additional training. They continued the routine clinical activities already planned for the clinic.

Data were processed and elaborated in each center. WHO prepared and distributed the adapted EPI INFO 5 PEP software for IBM-compatible personal computers and an instruction manual for data elaboration for all PEP record forms. Data analysis included mean and standard deviation, frequency distribution, and prevalence rates of variables from the record forms. As well as completing the record forms, PIs and responsible staff from each clinic interviewed staff and patients to evaluate educational procedures (TTT and EP) and patient/health personnel interrelation and satisfaction.

Each center collected the following information in a common format:

1. Health care system
2. Educational procedures:

- TTT
- EP

3. Patient/health personnel interrelation and satisfaction:

- outcomes affecting physicians and other health personnel
- outcomes affecting patients and relatives

4. Quality of hypertension care
5. Patients' satisfaction, awareness, and comprehension of their disease, and patient/health personnel interrelation
6. Comparison between baseline, follow-up, and final examination in the E and R groups

- compliance with medical prescription
- relevant variables (e.g., blood pressure, BMI, smoking, missed appointments, dropout)

7. Problems and solutions: analysis of problems and their solution during the study, such as patient

adherence to advise as well as medication, and ability to purchase drugs, ability to meet the clinic staff at specified times, transportation, ability to produce teaching materials (just to name a few).

Monitoring

Monitoring of progress and outcomes of the project was carried out through meetings and telephone conferences, periodic activity reports, and direct communication between principal investigators and WHO/WHL.

Processes Used

The main purpose of this project was to evaluate the feasibility of the study in different sociocultural environments, to assess the feasibility of modifying physician/health care worker behavior to focus on patient education through improved communication, and to provide more time on counseling.

The experience from the six pilot centers indicated that different methods are needed in different countries to achieve the desired results.

Canada: Because of the well-developed health care delivery system, the study used a combination of health care workers (physicians, nurses, social workers, dieticians, and health counselors) to provide intensive counseling for study subjects, both in a group and as individuals. The two groups were drawn from two different communities with similar sociodemographic conditions and separated by a distance of 400 km.

China and India: Used two separate health centers/clinics in the same city to isolate the E and R groups. Patient education was provided by physicians, nurses, and health workers.

Cuba: The two groups were drawn from two different communities. Patient education was provided by physicians, nurses, and a dietician.

Hungary: The two groups were drawn from two different communities. Patient education was done by physicians only.

Ghana: In the same policlinic, patients for the E and R groups were selected at random and came for consultation at different times. The public health nurse was the main focal point for patient education. A general awareness and education program for hypertension has been conducted in this clinic since 1972, so most participants were aware of the risk factors; this made it difficult to evaluate the impact of the patient education process used in this study.

All centers used group sessions for patient education (Table 3). Canada, Cuba, Ghana, and India also offered individual counseling sessions. While all centers used didactic lectures, including audiovisual materials, as a method of presentation, some centers (Canada, Hungary, and India) also used video presentations. All centers reported that they had adequate health education materials available for distribution. In all centers, except India, there were up to five group sessions/year. In India, group sessions were held once a month on selected days.

Results

The study included 1,197 adult hypertensive patients, at the baseline, of all ages and both sexes, 61 physicians, 31 nurses, and 18 other health workers from the participating clinics. They were assigned either to the E group or the R group in pilot centers from six countries.

The small number of patients enrolled in each center does not allow any statistical conclusions. Therefore, the results will be presented in a descriptive way.

Patient/Health Personnel Interrelation and Satisfaction

Effects on Physicians and Other Health Personnel

In all centers, physicians appreciated receiving up-to-date information on the management of blood pressure. They enjoyed interaction with university physicians and profited from the support offered by allied health personnel to their patients. They came to understand better the importance of educating patients. In general, their knowledge, attitude, and skills improved, especially in the field of communication.

All centers stressed the value of this method for improving the care of other chronic noncommunicable diseases. Ghana indicated that the "self-education and further interactive educational steps" approach has proved to be useful, realistic, feasible, and Cost-effective in the real conditions prevailing in that country.

In all centers, the nurses and other health workers participating in the study felt that they were part of a team. They gained a better understanding of the importance of educating the patients, and are aware of their influence on encouraging patients to comply with long-term treatment and follow-up. The project improved the partnership between physicians, nurses, and patients and also the quality of patient care.

TABLE 4. WHO/WHL Patient Education Project (PEP): Baseline Survey

Variables	Canada		China		Cuba		Ghana		Hungary		India	
	E	R	E	R	E	R	E	R	E	R	E	R
Sample size	89	85	60	109	104	105	100	100	119	134	97	95
Patient identification												
Sex (ratio M/F)	1.7	1.6	4.0	1.6	1.0	0.8	0.13	0.2	0.8	0.6	2.7	0.7
Age (Years) (mean)	38.8	39.6	60.0	55.0	56.9	57.8	59.9	60.1	61.5	61.8	47.5	46.9
Years of education (mean)	10.0	10.0	11.1	10.4	8.9	10.1	4.4	3.9	11.2	11.5	12.8	10.0
Marital status:												
Single (%)	n/a	n/a	n/a	n/a	n/a	n/a	5.1	4.5	16.0	10.0	n/a	1.0
Married (%)	n/a	n/a	90.0	97.2	n/a	n/a	50.0	31.8	64.0	57.0	100.0	99.0
Other (%)	n/a	n/a	n/a	n/a	n/a	n/a	44.9	63.7	20.0	33.0	n/a	n/a
Years since person became aware of High BP (mean)	9.2	8.3	11.5	11.8	12.0	15.7	3.6	8.8	10.1	11.2	6.0	2.2
Smokers (%)	64.0	64.7	45.0	33.0	39.6	35.2	n/a	n/a	12.0	17.0	19.0	9.0
Measurements												
(SBP) (mean) mmHg	149.5	146.6	161.9	168.8	138.2	137.3	165.4	164.1	173.5	154.7	166.2	157.6
(DBP) (mean) mmHg	98.5	99.7	96.5	100.4	87.4	87.0	100.1	103.0	98.1	90.6	106.0	102.4
SBP distribution												
<140 mmHg	39.4	42.4	3.3	2.7	13.4	16.8	14.0	16.0	6.5	20.0	4.0	0.0
140–159 mmHg	44.9	40.0	18.3	23.9	23.7	24.6	23.0	30.0	14.0	38.5	34.0	54.0
>159 mmHg	15.7	17.6	68.4	73.4	59.8	57.1	63.0	54.0	79.5	41.5	62.0	46.0
DBP distribution												
<90 mmHg	4.5	7.1	8.3	2.7	16.5	18.3	23.0	17.0	29.0	53.8	2.0	0.0
90–94 mmHg	68.5	60.0	25.0	25.7	23.7	24.6	28.0	32.0	17.2	24.6	11.0	11.0
>94 mmHg	27.0	32.9	66.7	71.6	59.8	57.1	49.0	51.0	53.8	21.6	87.0	89.0
BMI (kg/m^2) (mean)	28.3	27.7	25.9	26.0	26.6	25.0	n/a	n/a	26.8	27.0	25.6	25.9

BMI = body mass index; DBP = diastolic blood pressure; E = education group; M/F = male/female ratio; n/a = not assessed; R = routine group; SBP = systolic blood pressure.

In Ghana, the use of a trained senior public health nurse proved to be extremely useful for dealing with patients and relatives with little or no formal schooling and different cultural backgrounds. In Hungary, nurses came to understand that the key to high blood pressure control is the health personnel's relationship with the patients.

Effects on Patients and Relatives

In all centers, patients and their relatives proved to have a positive attitude toward the educational process and toward improving their knowledge and their role in the management of hypertension, which facilitated and improved patient/nurse/physician interaction.

In Canada, patients and relatives formed a club to meet and discuss the issues among themselves; health care workers were present during these discussions as moderators. In Cuba, doctors felt that sometimes the patients listened much more carefully and learned more from the experience of other patients than from the information and explanations given by physicians and nurses. In India, the project also influenced the health awareness of patients' relatives.

Quality of Hypertension Care

Baseline and End-of-Study Information

Table 4 shows the demography of study patients from the six pilot centers, their blood pressure, and other variables in the E and R groups at the beginning of the study. In China, the E group included more men and smokers, and in Cuba the E group had a higher percentage of smokers. In India, the E group had more patients with heart involvement, smokers, and high mean systolic (SBP) and diastolic (DBP) blood pressure. In Ghana, both groups had a higher number of females and in Hungary the E group had more patients with high mean SBP and DBP, and a lower percentage of smokers.

Table 5 shows demographic information and compliance with treatment (both pharmacological and nonpharmacological) at the end of the study in the six centers. There was a substantial decrease in mean SBP and DBP in Canada, China, Cuba, Hungary, and India. Although a modest decline in SBP was observed in the R groups in Cuba, Hungary, and India, there was a significant decrease in SBP and DBP in the Chinese R group and no change in SBP in the Canadian R group. A modest decrease

TABLE 5. WHO/WHL Patient Education Project (PEP) Final Survey

Variables	Canada E	Canada R	China E	China R	Cuba E	Cuba R	Ghana E	Ghana R	Hungary E	Hungary R	India E	India R
Sample size	67	72	59	80	96	97	76	78	112	116	94	90
Measurements												
SBP (mmHg) (mean)	139.3	146.3	134.2	137.1	129.8	135.9	158.8	162.0	157.4	145.6	129.8	143.7
DBP (mmHg) (mean)	90.0	93.5	82.6	83.8	85.6	86.9	97.3	103.0	84.9	82.7	81.6	94.4
SBP distribution (%)												
<140 mmHg	67.2	54.1	63.3	57.8	50.0	33.7	13.9	15.3	9.4	25.3	77.3	7.4
140–159 mmHg	26.9	33.3	33.3	39.4	4.2	8.9	22.3	29.7	58.5	62.6	22.7	89.5
>159 mmHg	5.9	12.5	3.4	2.8	45.8	57.4	63.0	55.0	32.1	12.1	0.0	3.2
DBP distribution (%)												
<90 mmHg	55.2	58.3	76.7	67.9	52.3	34.2	12.0	15.3	60.4	77.5	93.8	3.2
90–94 mmHg	23.9	12.5	23.3	28.4	4.2	9.3	28.0	29.2	28.3	14.7	4.1	47.4
>94 mmHg	20.9	29.2	0.0	3.7	43.5	56.5	60.0	55.5	11.3	7.8	2.1	49.5
BMI (kg/m^2) (mean)	26.7	29.8	25.7	26.3	25.4	25.2	25.3	27.5	26.5	n/a	23.3	25.6
Smokers (%)	42.0	57.1	32.0	31.0	20.8	25.0	n/a	n/a	10.0	n/a	5.2	6.3
Missed appointments (%)	n/a	n/a	3.0	14.0	n/a	n/a	3.0	4.0	n/a	n/a	50.5	36.8
Compliance with medical prescriptions												
Pharmacological (%)	95.2	89.5	100.0	100.0	100.0	95.0	n/a	n/a	93.0	90.0	99.0	51.1
Nonpharmacological (%)	88.3	73.7	82.0	n/a	67.1	47.5	n/a	n/a	86.6	78.3	99.6	92.6
Dropout rate (%)	24.7	15.3	1.6	26.6	7.7	7.6	24.0	22.0	6.0	13.0	3.0	5.0

BMI = body mass index; E = education group; M/F = male/female ratio; n/a = not assessed; R = routine group.

in DBP was seen in the R group in Canada, Hungary, and India.

In Ghana, there was a modest decrease in both mean SBP and mean DBP in both E and R groups. BMI showed a moderate decrease in the E group, but was virtually unchanged in the R group.

Patient Satisfaction

In all centers, patients' awareness and understanding of their disease and the patient/health personnel interrelation markedly improved in the E group. Patients had a better knowledge of the disease and better information about health and management of hypertension, and adherence to follow-up and treatment.

In Cuba and India, a comparison of data from the initial and the final patient questionnaire showed that patient satisfaction increased in both groups; adherence to follow-up and treatment improved much more in the E group, although an increase was also observed in the R group; in both centers, patients agreed on the importance of keeping the same physician.

In Canada, patients enjoyed new ways of preparing healthy food. In China, they paid more attention to exercise, weight reduction, reduced salt intake, and relaxation.

In general, patients' quality-of-life improved considerably.

Compliance with Medical Prescriptions

In general, there was a marked increase in adherence to the treatment and follow-up regime and improved compliance with medical prescriptions, both pharmacological and nonpharmacological (Table 5). There were poor outcomes in China with regard to physical activity and alcohol consumption.

Measurement of Relevant Variables

In all six centers, there was a progressive and marked decrease in mean SBP and DBP. However, this was less marked in Ghana. There were a high percentage of patients with SBP and DBP under control (i.e., below 140/90 mmHg). In Ghana, the SBP/DBP distribution did not reveal a significant improvement in either the E or the R group, this may be due to the high cost of drugs, which makes it difficult for otherwise cooperative patients to adhere to the prescribed treatment in the long-term. There was also a decrease in mean BMI and in the percentage of smokers (Tables 4 and 5).

Interim Events

The dropout rate in the E group ranged from 1.6% in China to 3.0% in India through < 10% in Hungary and Cuba to > 20% in Canada and

Ghana; in the R group it ranged from 5.0% in India to 26.6% in China (Table 5). In Ghana, intervention in the E group helped to reverse the usual trend, in which some patients with particularly complicated cases dropped out and resorted to traditional or herbal treatment. Morbidity and mortality due to hypertension-related diseases were not evaluated because of the small sample and the short duration (2–3 years) of the study.

Benefits of the Study

Because of the study's common protocol and standardized methodology, it was possible to compare results from different centers, and a valuable sharing of knowledge became possible. Informal networks and capacity building helped to motivate the investigators to carry out the study in their respective countries. This study acted as a catalyst for a number of national initiatives, at least in some countries.

Problems Encountered

At the beginning, centers had difficulties mainly with printing record forms and selecting patients, and also with the use of the EPI INFO 5 PEP software for data processing. The problems were solved as the study progressed.

Since the study was conducted by the principal investigators and there was no central budgetary provision for it, some centers found it difficult to employ a full-time coordinator to follow-up the study.

In some centers, physicians' willingness to cooperate began to decline after 2 years. Motivation of health care professionals is essential if such interventions are to be carried out on a long-term basis.

Some centers had local difficulties that indirectly influenced the study. In Canada, healthy foods (low fat, low salt, and low calorie) were not readily available in local stores at the time of the study. Most of the physicians involved in the study were in private practice, and said that they had little time to spare in their busy clinical practice for unpaid counseling activities. In Cuba, there was a shortage of supplies for laboratory tests and ECGs, and a lack of some antihypertensive drugs on the market; some patients found it difficult to get to meetings of the patients' and relatives' health education group, and some family physicians and patients moved out of the study area. In Ghana, it was not possible to organize the planned TTT workshop; equipment and supplies were lacking, and some patients did not adhere to the prescribed treatment because they could not afford to buy the drugs regularly. In Hungary, changes in the health care system compelled some patients to move to other clinics. In India, there were indigent patients who had to travel long distances to keep appointments. This often deterred the patients from keeping appointments.

All centers solved their difficulties as best they could in the prevailing local situation, sometimes with the support of the scientific and university centers.

Viability of the Project After the Study Period

In Canada, 8 months after the end of the study, there was a gradual slowing down in the improvement of outcomes related to control of high blood pressure and other CVD risk factors. Concern at this development led to national and provincial strategy changes in the health care system. Cuba has started an extension of PEP to other areas, supported by the Institute of Cardiology. India stressed the need for scientific/university level input, at least twice a year, to encourage staff to follow the method in the long-term. All PIs agreed that the collaborative work with scientific/university/high level hospital-based staff brought additional incentives for primary health care staff, and that a reference area is not necessary.

Conclusions

1. The patient education project strategy is applicable and feasible in various socioeconomic and cultural settings, and in different health care delivery systems.

2. This project provides a cost-effective way of improving the quality of care and patient adherence to long-term treatment, not only for hypertension, but for other cardiovascular and chronic noncommunicable diseases and cardiovascular risk factors.

3. Interactive communication between patients and health care workers encourages patients to play a greater role in the control of their hypertension, and leads to better compliance with pharmacological and nonpharmacological prescriptions.

4. Self-instruction and self-assessment and the use of trained public health nurses are useful aids to patient education.

5. Collaboration with scientific/university/high-level hospital-based colleagues provides additional incentives for primary health care staff.

6. Physicians at the community level benefit from the support given by allied health care personnel to their patients.

7. One major concern is how to maintain the beneficial effects of the patient education project once the study is over.

8. The PEP experience can be integrated as a simple service-oriented activity into the health care system of interested centers and countries as a cost-effective way of improving the quality of care and encouraging patient adherence to long-term treatment, not only for hypertension, but for other cardiovascular and chronic noncommunicable diseases.

9. The PEP experience can be applied as part of the country strategy for prevention and control of cardiovascular and other noncommunicable diseases.

10. The PEP experience should be integrated into the regular curriculums of medical students and other trainee health professionals.

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Appendix 1.

WHO/WHL PEP: Sites and Key Personnel

CANADA
Division of Community Medicine, Memorial University of Newfoundland & Canadian Coalition for High Blood Pressure Prevention and Control

Dr. A. Chockalingam* and Professor G. Fodor

GHANA
Department of Medicine and Therapeutics, University of Ghana Medical School

Professor S. Dodu* and Professor J. Kpodonu

CHINA
Cardiovascular Institute and Fu Wai Hospital, Chinese Academy of Medical Science & Peking Union Medical College

Professor L. Liu* and Professor J. Xie

HUNGARY
Hungarian Institute of Cardiology

Dr. J. Duba* and Dr. J. Kishegyi

CUBA
Cuban Institute of Cardiology

Dr. A. Dueñas* and Dr. G. Debs-Perez

INDIA
All India Heart Foundation National Heart Institute

Dr. S. Padmavati*

* Principal Investigators

PEP coordinating/management center

WHL-World Hypertension League

Dr. T. Strasser,* Geneva, Switzerland (WHL Secretary-General until 1995)

Dr. A. Chockalingam,* Manager, Dissemination and Professional Liaison Section, HPPB, Health Canada, Ottawa, Ontario, Canada & Special Advisor, WHL

WHO-World Health Organization

Dr. I. Gyarfas,* Budapest, Hungary (Chief WHO/CVD until 1996)

Dr. Ingrid Martin,* Responsible Officer, WHO/NCD/NCP/CVD Progra, Geneva, Switzerland

Dr. P. Nordet,* Medical Officer, WHO/NCD/NCP/CVD Progra, Geneva, Switzerland

* Principal Investigators

Appendix 2.

Specific Strategy by Center

Canada

E Group				R Group			
Patients	Physicians	Nurses	Allied Health Workers	Patients	Physicians	Nurses	Allied Health Workers
89	7	4	3	85	6	2	0

Two outpatient clinics, dealing with hypertensive patients from two Newfoundland fishing communities 400 km apart, were involved in the study, Carbonear, for the educational group (E), and Twillingate, for the reference group (R). The two communities are identical in socioeconomic characteristics. Hypertensive patients were selected by random sample.

Strategy for Health Education in the E Group

1. Approaches for physicians and health personnel (teaching the teacher [TTT]): The input was training for physicians and other health personnel in methods of educating their patients in blood pressure control. Physicians and study staff of the E group attended a 1-week intensive training program offered by the principal investigators, using the teaching manual Educating the Hypertensive Patient.[17] The program covered: available scientific evidence, guidelines for proper blood pressure measurement, management of high blood pressure in the context of multifactorial risk factors for CVD, emphasis on nonpharmacological therapy as an initial step followed by pharmacological therapy if necessary, importance of adherence to treatment, follow-up to encourage patients to keep their appointments, and partnership with patients and their families.

2. Approaches for patients and relatives (educating the patient [EP]): The trained health personnel of the outpatient clinic organized the following patient education activities: audio/video information, distribution of health education literature, individual and group counselling, cooking demonstrating, advice on judging the fat, salt, sugar, and calorie content of foods from information on product labels, and "Dos" and Don'ts" food guidelines for a healthy heart developed by Drs. Fodor and Chockalingam, and self-measurement of blood pressure.

Strategy for the R Group

The health personnel and patients in this group did not receive any additional input on health education for hypertension, but followed the routine activities of the clinic.

China

E Group				R Group			
Patients	Physicians	Nurses	Allied Health Workers	Patients	Physicians	Nurses	Allied Health Workers
60	6	2	2	109	8	4	2

Seven clinics from Beijing were randomly selected for the E and R groups. Patients were assigned to the E or R group according to the clinic they attended. The study lasted 3 years.

Strategy for Health Education in the E Group

1. Approaches for physicians and health personnel (TTT): Staff from the E group clinics attended an educational course and discussed the teaching manual Educating the Hypertensive Patient[17] with the principal investigators. A multiple-choice questionnaire was used to elicit feedback about the recipients' understanding and application in practice of the information imparted during the course. The course covered: counseling on pharmacological and nonpharmacological treatment (weight reduction, physical exercise, reduced salt and alcohol intake, and relaxation techniques using a biofeedback instrument), adherence to medication, self-measurement of blood pressure, monitoring of progress towards target blood pressure, reduction of other CVD risk factors (lipids, smoking, etc.), and keeping appointments.

2. Approaches for patients and relatives (EP): Patients and their relatives were invited to a group meeting every 2 months. Lectures were given by the physicians in charge on the following topics: hypertension, how to reduce risk factors (reducing salt intake), and how to cooperate with the physician in controlling blood pressure and preventing adverse events.

Strategy for the R Group

Physicians and nurses of the R group participated in PEP conferences in order to understand the aims and methods of PEP in the selection, treatment, and follow-up of patients, but they treated their patients routinely without any intervention. This group did not receive any additional input on health education for hypertension.

The study was integrated into the normal structure and facilities of the participating units/clinics.

Cuba

E Group				R Group			
Patients	Physicians	Nurses	Allied Health Workers	Patients	Physicians	Nurses	Allied Health Workers
104	6	6	1	105	6	6	—

The project was based on primary health care through the family physician network. The physician and nurse from each of 12 family physician clinics in the municipality "10 de Octubre," were selected to participate voluntarily (six from one health area for the E group and six from another area for the R group). Each doctor selected at random 30 hypertensive patients aged 25 or over from the clinic's morbidity register to participate in the study.

Both groups were followed up every 3 months. The doctors and patients completed the initial inquiry and the initial examination forms, the yearly follow-up form, and the final inquiry and examination forms. The physician or nurse gave a card showing basic information and the date of the next visit to every patient in both groups. The final examination took place 24 months after the initial one.

Strategy for Health Education in the E Group

1. Approaches for physicians and nurses (TTT): The principal investigator organized a seminar, workshop, or lecture once a week for 8 weeks and then once a month for the duration of the study, covering: education about hypertension and its complications, management of the disease and its risk factors and also of other CVD risk factors, pharmacological and nonpharmacological treatment, encouraging adherence to treatment, health education and interpersonal communication, study, discussion, and analysis of the manual Educating the Hypertensive Patient[6] and other material related to hypertension control, and prevention and interpersonal communication.

The manuals Educating the Hypertensive Patient[17] and Educacion al Paciente Hipertenso, Manual de Entrenamiento para el Personal de la Salud (Educating the Hypertensive Patient: A Training Manual for Health Personnel), prepared by Drs. A. Dueñas and R. de la Noval, were distributed to all physicians and nurses of the E group as self-educational material.

2. Approaches for patients and relatives (EP): The physician and/or nurse in each clinic organized a monthly meeting with a group of ten patients and their relatives to exchange ideas about health and patient education, management of hypertension, pharmacological and nonpharmacological treatment and advice on adverse effects of anti-hypertensive drugs, management of CVD risk factors, diet: how to cook and eat without salt, and exchanges of experience among patients and relatives with the participation of the nurse and/or physician.

Strategy for the R Group

The physicians, nurses, and patients in this group applied the normal strategy planned for the Cuban Ministry of Health for hypertensive patients. This group did not receive any additional input on health education for hypertension.

The PEP study was integrated into the normal structure and facilities of the primary health care system of the country. The Cuban Institute of Cardiology (Professors A. Dueñas and G. Debs-Perez) supported the training of health personnel and the provision of health education material.

Ghana

E Group				R Group			
Patients	Physicians	Nurses	Allied Health Workers	Patients	Physicians	Nurses	Allied Health Workers
100	4	2	4	100	4	1	4

Two clinics, one for each group, were set up at the same polyclinic at Mambrobi (a suburb of Accra), working on alternate Fridays. Each one was staffed by one co-principal investigator, a resident, and two interns. There was no difficulty in keeping the groups separated.

Strategy for Health Education in the E Group

1. Approaches for physicians and nurses (TTT): It was not possible to organize formal "teaching the teacher" workshops for the health personnel. Instead, the staff of the E clinic was

given the manual Educating the Hypertensive Patient[17] and a pamphlet adapted for local use, entitled Educating the Hypertensive Patient—An Approach to the Training of Health Professionals, for self-education and further interactive education as part of the patient management process. This material covered applying the recommended methods for hypertension control and facilitating the interactive process between physician and patients.

2. Approaches for patients and relatives (EP): A senior public health nurse was recruited and trained to provide group sessions for the E group. These sessions lasted about 1 hour and attracted an average of 25 patients; the co-principal investigator attended the educational sessions as an observer and was able to answer any queries that arose. The nurse approach is the most realistic and feasible method in the circumstances prevailing in Ghana today. It covered health education and patient education and facilitating the physician/nurse/patient interactive process.

Strategy for the R Group

The staff and patients in this group did not receive any additional input on health education for hypertension. Staff applied the routine strategy planned by the health structure.

A team of four nonmedical research assistants and a nurse performed logistical duties for both the E and the R group without discrimination. Guidelines were distributed about choices of antihypertensive drugs and their cost in the market.

The study was implemented within the normal structure of the Mamprobi polyclinic with the technical support of the Department of Medicine and Therapeutics, University of Ghana Medical School (Professors S. Dodu and J. Kpodonu); the university also provided the training material.

Hungary

E Group				R Group			
Patients	Physicians	Nurses	Allied Health Workers	Patients	Physicians	Nurses	Allied Health Workers
119	5	—	—	134	5	—	—

This program was based on primary health care through the family physician system. The physicians working with both the E and the R group received basic training in blood pressure measurement and pharmacological and nonpharmacological treatment of hypertension.

Strategy for Health Education in the E Group

1. Approaches for physicians and nurses (TTT): The principal investigators and the physicians met regularly once a month in 1992 and 1993 and later every 2 or 3 months. The educational activities covered methodological discussions and practical activities related to the principles and skills of PEP: role-playing exercises, studying videorecordings showing communication practice between students or postgraduate doctors and trained actors playing different types of patients, every session was taperecorded and subsequently transcribed, and the transcripts were distributed to the physicians; physicians were issued with automatic tensiometers and trained how to teach patients to measure their own blood pressure; nurses were trained by the physicians in an interactive manner during the physicians' group sessions with patients.

2. Approaches for patients and relatives (EP): Physicians organized education sessions with their patients, some of which were tape-recorded for further discussion. These sessions covered: health education and patient education related to hypertension, studying videorecordings of communication practice between students or postgraduate doctors and trained actors playing different types of patients, emphasis on nonpharmacological techniques and training patients how to practice them, and high-risk habits and how to change them.

Strategy for the R Group

The physicians in this group applied the normal strategy planned by the center. This group did not receive any additional input on health education for hypertension.

India

E Group				R Group			
Patients	Physicians	Nurses	Allied Health Workers	Patients	Physicians	Nurses	Allied Health Workers
97	2	2	1	95	2	2	1

Two clinics, one for the E group and the other for the R group, were set up in different health clinics, 15 km apart. The study lasted 3 years.

Strategy for Health Education in the E Group

1. Approaches for physicians and nurses (TTT): A meeting was held regularly once a month with all staff to provide training and teaching for physicians and other health personnel, mainly through lectures, slides, and video presentations. New material was introduced regularly. The meetings covered health education and interpersonal communication, management of hypertension and other CVD risk factors, improving the quality of blood pressure measurement and information about hypertension and its complications, and encouraging patients to comply with treatment.

2. Approaches for patients and relatives (EP): Lectures, slide, and video presentations were used for monthly sessions with patients. The principal investigator and staff organized meetings with patients on relevant days such as World Health Day (April 7) and World No-Tobacco Day (May 31) to provide information about hypertension and promote dialogue. Both health personnel and patients received the monthly bulletin Heart News with a new feature containing articles and a question-and-answer column on hypertension. The booklet High Blood Pressure: A Manual for Laymen was given to all health personnel and patients.

Strategy for the R Group

The physicians in this group applied the normal strategy planned by the center. This group did not receive any additional input on health education for hypertension.