

In the name of God

Nursing care for patients with high blood pressure

Presented by
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Introduction

- **WHO report 2020:**
- The prevalence of hypertension in the Islamic Republic of Iran among **adults aged > 25 years** was estimated at **31% in men** and **27% in women**.
- A study in Yazd revealed that **53.7%** of people with hypertension were aware of their disorder, **24% of them were under treatment**, and only **8%** had controlled hypertension
- As prevalence of hypertension is probably increasing in **low- and middle-income countries** including the Islamic Republic of Iran

Cont.

- About **31%** of the **adults** in the United States have hypertension.
- **African-Americans** have the highest prevalence rate of **37%**.
- In the total US population of persons with hypertension, **90% to 95% have primary hypertension** or high blood pressure from an **unidentified cause**.
- The remaining **5% to 10%** of this group have **secondary hypertension or high blood pressure** related to identified causes.
- Hypertension is also termed as the **“silent killer”** because **46%** of people who had pressures exceeding 140/90 mmHg were **unaware** that their blood pressures were elevated.
- **A CDC survey in 2017-2019 found the following things:**
- Hypertension increases with an increase in age **22.4%** (aged 18–39), **54.5%** (40–59), and **74.5%** (60 and over).

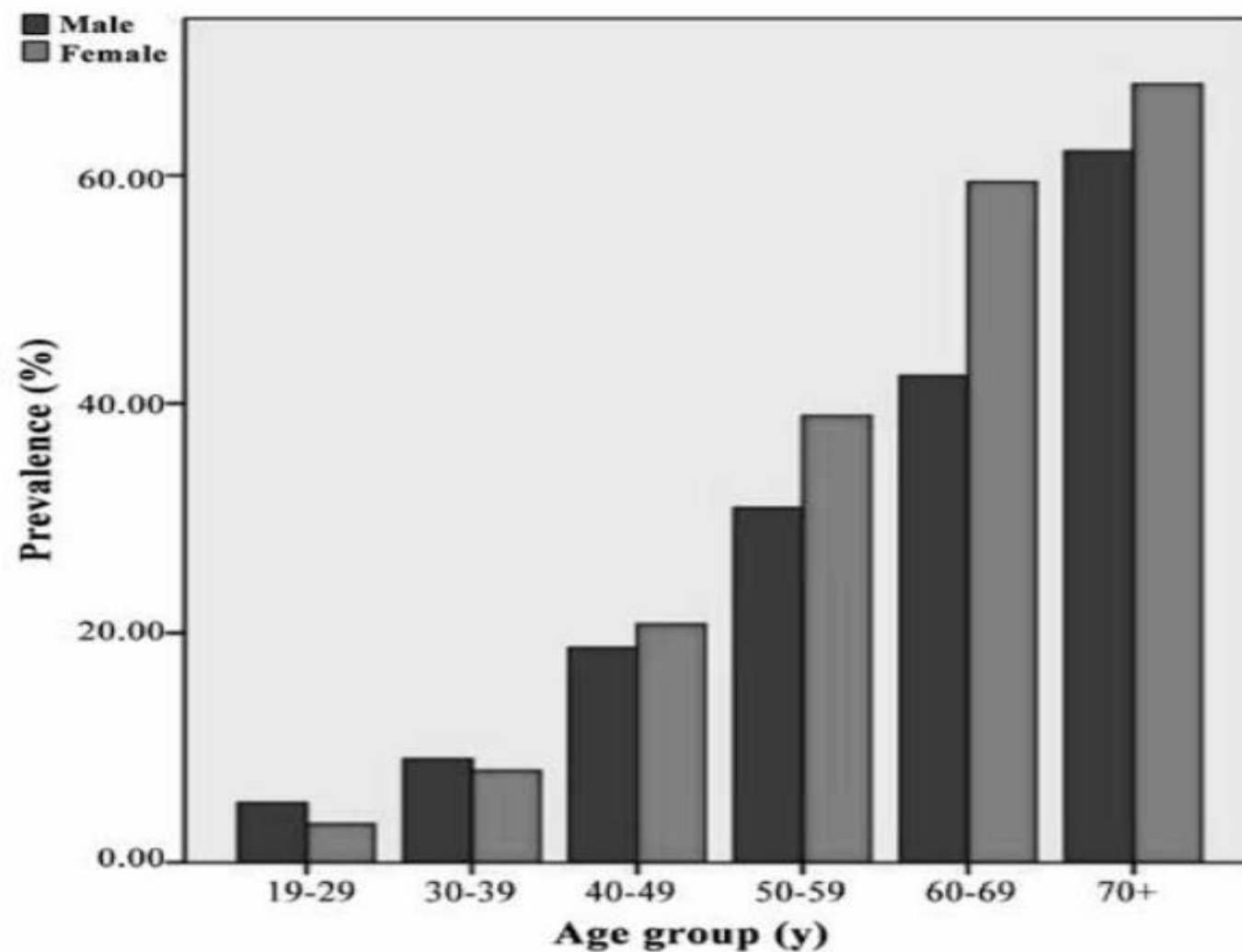
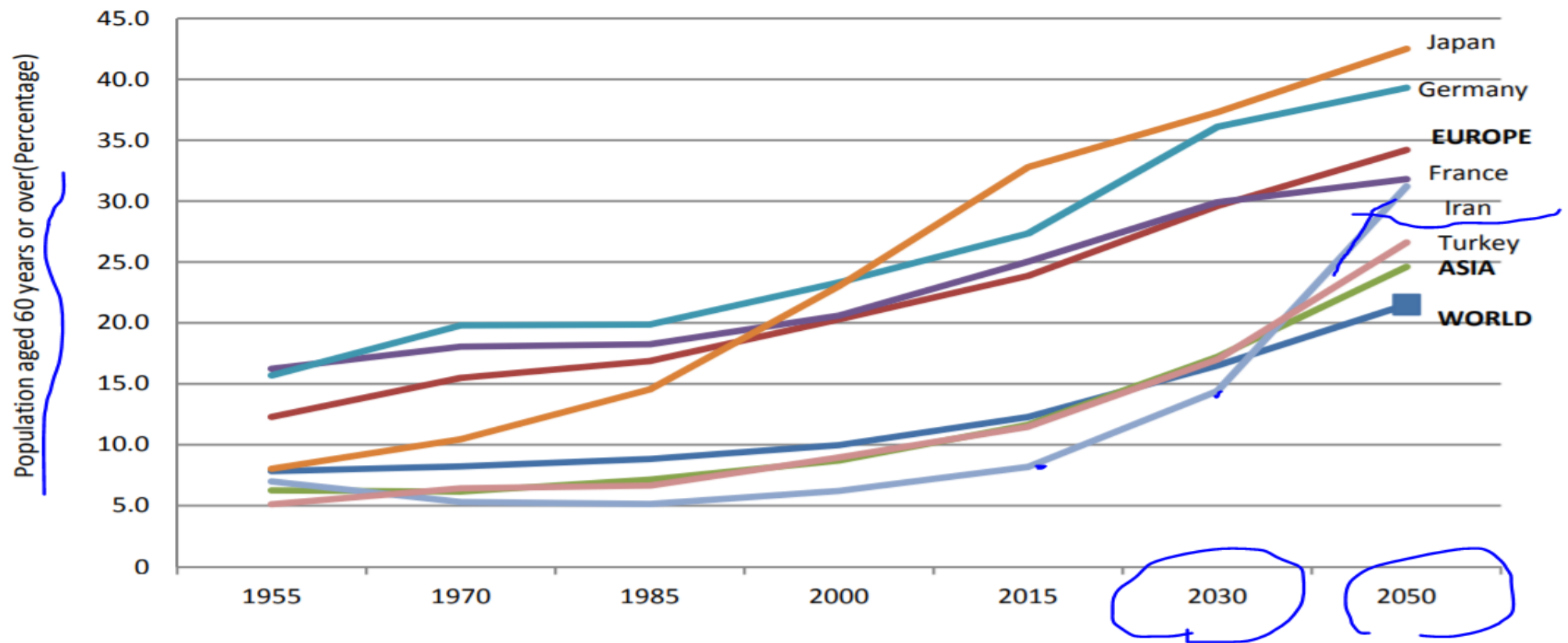
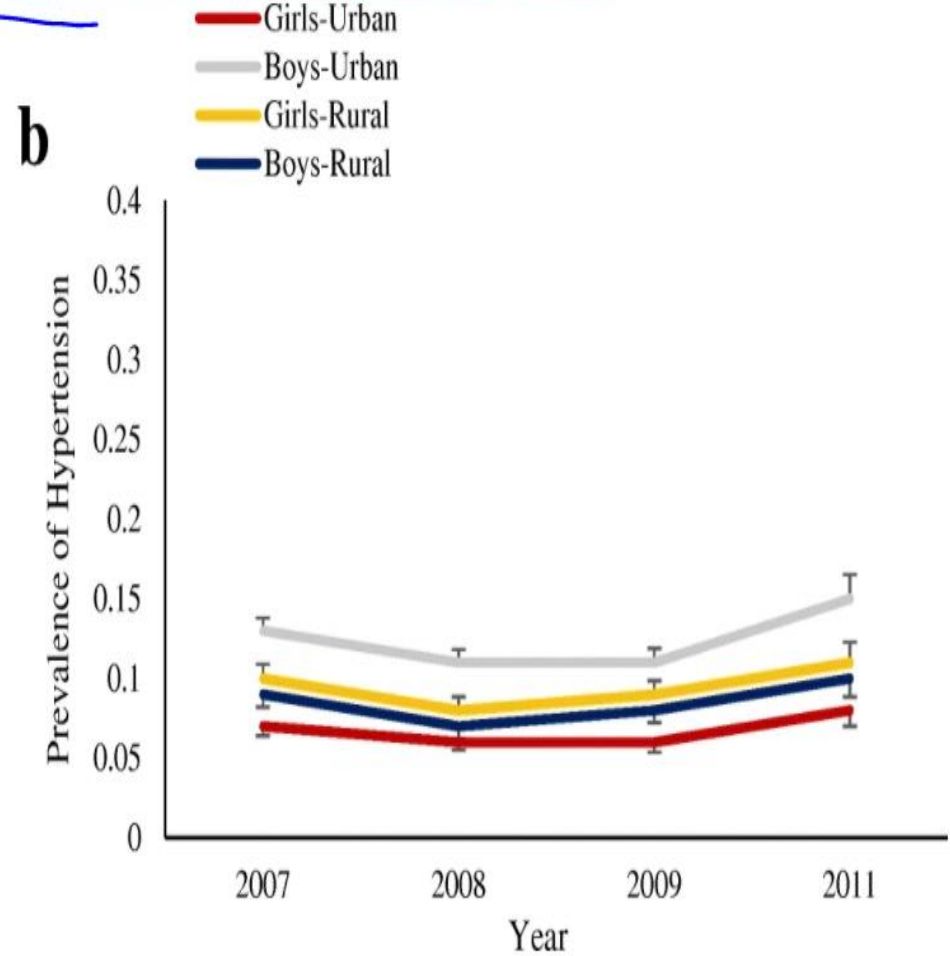
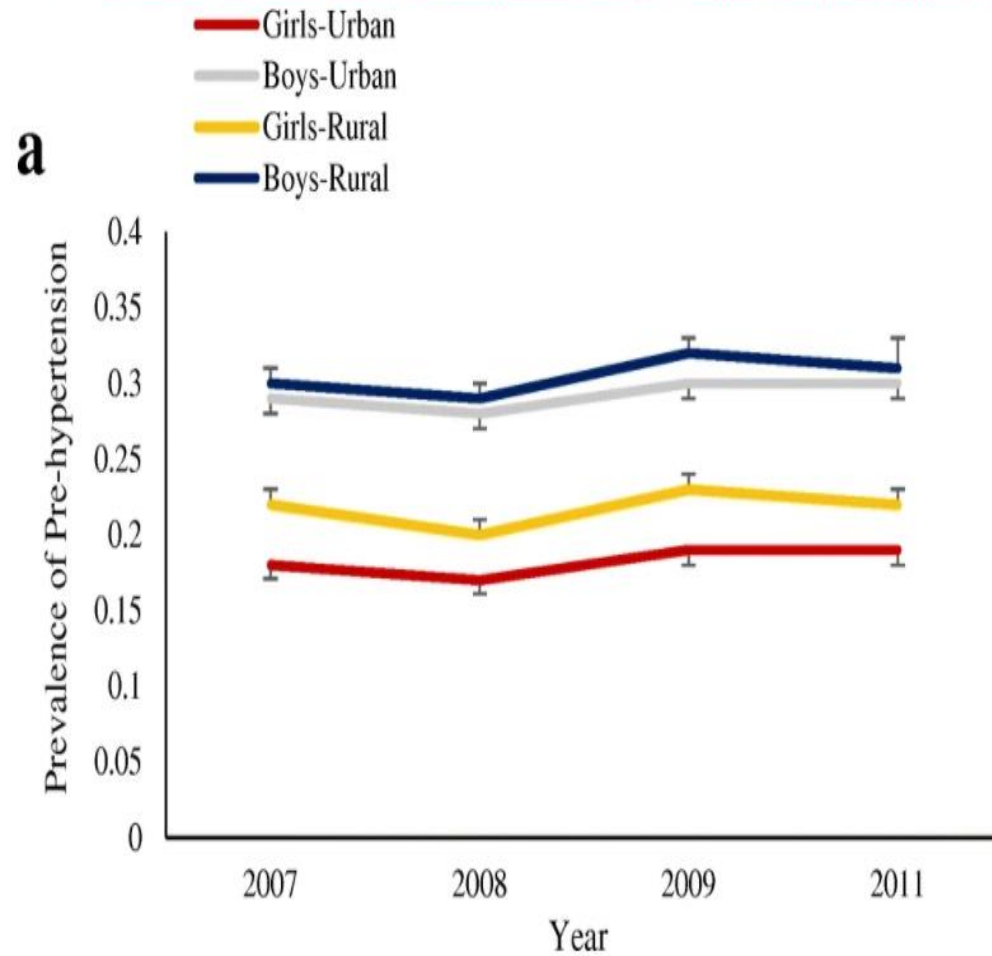


Figure 2. Variations in the prevalence of hypertension by age groups in males and females in Iran (1980–2012).

Aging rate prediction



From: National trends of pre-hypertension and hypertension among Iranian adolescents across urban and rural areas (2007–2011)



What is Blood Pressure?

- Blood pressure is the **force exerted on the walls of an artery** by the pulsing blood under pressure from the heart
- Systemic or arterial BP, the BP in the system of arteries in the body, is a good indicator of cardiovascular health.
- Blood flows throughout the circulatory system because of pressure changes. It moves from an area of high pressure to one of low pressure

Physiology of Arterial Blood Pressure

- **Blood pressure reflects the interrelationships of:**

- cardiac output
- peripheral vascular resistance
- blood volume
- blood viscosity
- artery elasticity

Factors Influencing Blood Pressure

- Age
- Stress
- Genetics
- Gender
- Daily variation
- medication

Average Optimal Blood Pressure for Age

Age	Blood Pressure (mm Hg)
Newborn (3000 g [6.6 lb])	40 (mean)
1 month	85/54
1 year	95/65
6 years ^a	105/65
10-13 years ^a	110/65
14-17 years ^a	119/75
18 years and older	<120/<80

^a In children and adolescents, hypertension is defined as blood pressure that on repeated measurement is at the 95th percentile or greater adjusted for age, height, and gender.

Classification of HTN

CATEGORY	SYSTOLIC	DIASTOLIC
Normal	<120	<80
Prehypertension	120-139	80-89
Stage 1 Hypertension	140-159	90-99
Stage 2 Hypertension	>160	>100
Hypertensive Emergency	>180	>120

Blood pressure measuring notes

- **Blood pressure (BP)** is measured in **both arms** and, for suspected congenital cardiac disorders or peripheral vascular disorders, in **both legs**.
- The bladder of an appropriately sized cuff encircles **80% of the limb's circumference, and the bladder's width is 40% of the circumference**.
- The first sound heard as the mercury column falls is **systolic pressure**; disappearance of the sound is **diastolic pressure** (5th-phase Korotkoff sound).
- **Up to a 15 mm Hg** pressure differential between the **right and left arms is normal**; a greater differential suggests a **vascular abnormality** (eg, dissecting thoracic aorta) or a peripheral vascular disorder.
- **Leg pressure is usually 20 mm Hg higher than arm pressure. To obtain an accurate blood pressure measurement, the patient should:**
 - *Be seated in a chair (not on the examination table) for > 5 minutes, feet on floor, back supported*
 - *Have the limb supported at heart level with no clothing covering the area of cuff placement*
 - *Abstain from exercising, consuming caffeine, or smoking for at least 30 minutes before the measurement is taken*

Cont.

- **For accurate blood pressure measurement follow the 7 strategies of the American Heart Association (AHA):**
- No conversation
- Empty bladder
- Use correct cuff size
- Place BP cuff on a bare arm
- Support arm at heart level
- Keep leg uncrossed
- Support back and feet



Table 1: AHA/ACC^a Guideline Recommendations by Blood Pressure Category

BP ^b Category	Pressure Ranges	Recommendations
Normal BP	<120/<80 mmHg	Promote healthy lifestyle; reassess BP annually.
Elevated BP	120-129/<80 mmHg	Start with nonpharmacologic therapy, reassess BP in 3-6 months.
Stage1 Hypertension	130-139/80-89 mmHg	ASCVD^c or 10-year CVD^d risk \geq10%: Start with both nonpharmacologic and pharmacologic therapy. Reassess BP in 1 month. If at goal, reassess every 3-6 months. If not at goal, assess for adherence and consider intensification of therapy.
		No ASCVD and 10-year CVD risk <10%: Start with nonpharmacologic therapy, reassess BP in 3-6 months. If not at goal, consider initiation of pharmacologic therapy.
Stage 2 Hypertension	\geq 140/ \geq 90 mmHg	Start with both nonpharmacologic and pharmacologic therapy. Reassess BP in 1 month. If at goal, reassess every 3-6 months. If not at goal, assess for adherence and consider intensification of therapy.

a: AHA/ACC, American Heart Association, American College of Cardiology.

b: BP, blood pressure.

c: ASCVD, atherosclerotic cardiovascular disease.

d: CVD, cardiovascular disease

Hypertension causes

Primary causes	Secondary causes
<ul style="list-style-type: none">▪ Hyperactivity of sympathetic nerve stimulation▪ The release of vasoactive substances from endothelial cells results in vasoconstriction.▪ Increase in cardiac output and arteriole constriction.▪ Excessive sodium intake, Sodium retention, hyperinsulinemia.▪ Family history of hypertension	<ul style="list-style-type: none">▪ Congenital anomalies▪ Polynephritis▪ Obstruction in renal artery▪ Acute or chronic glomerulonephritis▪ Aortic stenosis▪ Tumours in the adrenal gland (Pheochromocytoma)▪ Cushing's syndrome▪ Hyperthyroidisms▪ Sleep apnea▪ Drugs such as NSAIDs, estrogen, sympathomimetics, steroids, antidepressants etc.



Physiology/Pathophysiology

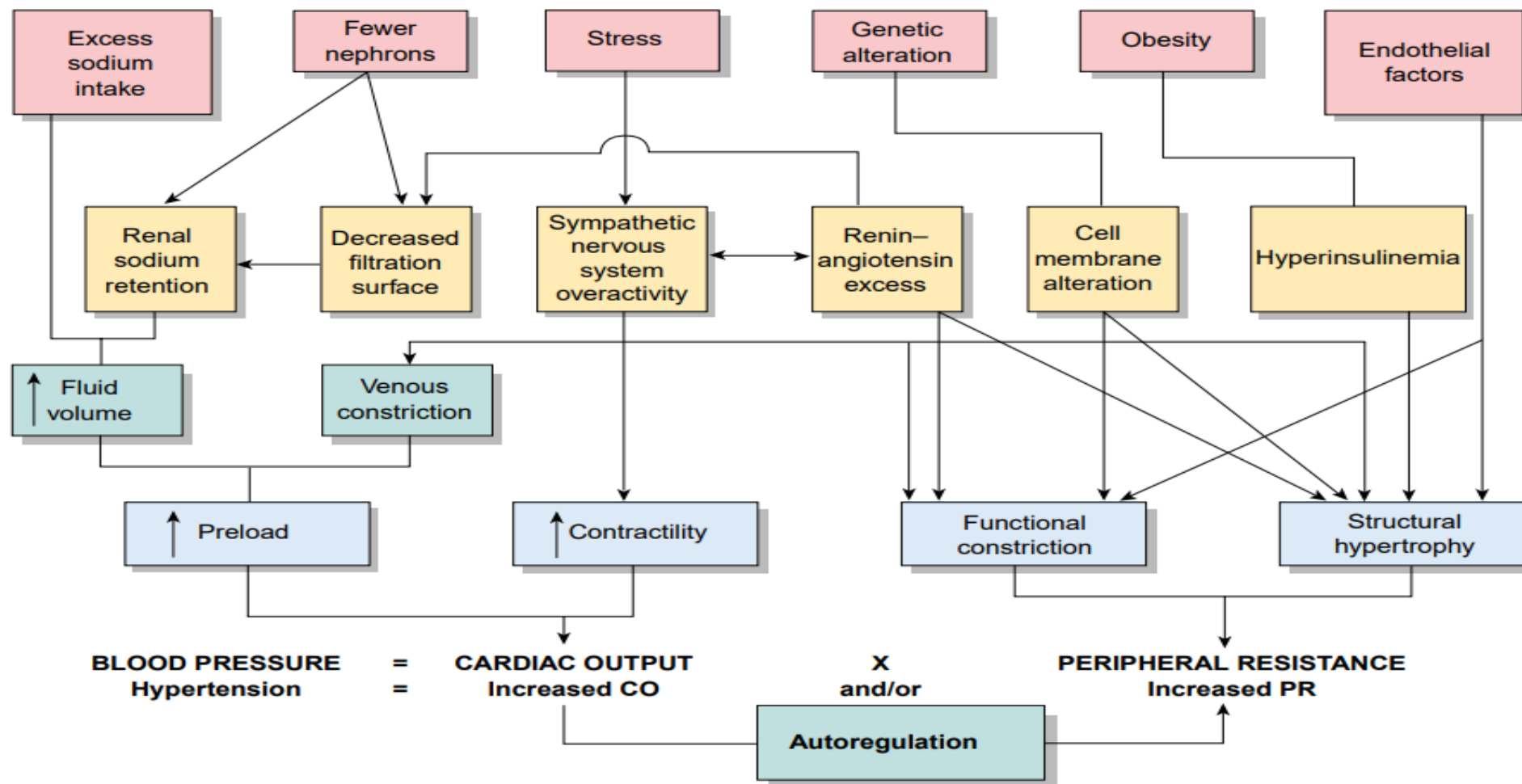


FIGURE 32-1 Factors involved in control of blood pressure, which is cardiac output multiplied by peripheral resistance. Adapted from Kaplan, N. M., Lieberman, E., & Neal, W. (2002). *Kaplan's clinical hypertension* (8th ed.). Philadelphia: Lippincott Williams & Wilkins.

Clinical manifestation of HTN

- Severe headache
- Chest pain
- Blurring vision
- Bleeding from nose
- Difficulty in breathing
- Hematuria
- Irregular heartbeat
- Confusion
- Seizure
- Nausea and vomiting
- Pain in neck and back
- Flushing
- Feeling hot
- Lightheadedness
- Dizziness

HYPERTENSION SIGNS AND SYMPTOMS



Dizziness



**Irregular
Heartbeat**



Nausea



Vomiting



Fainting

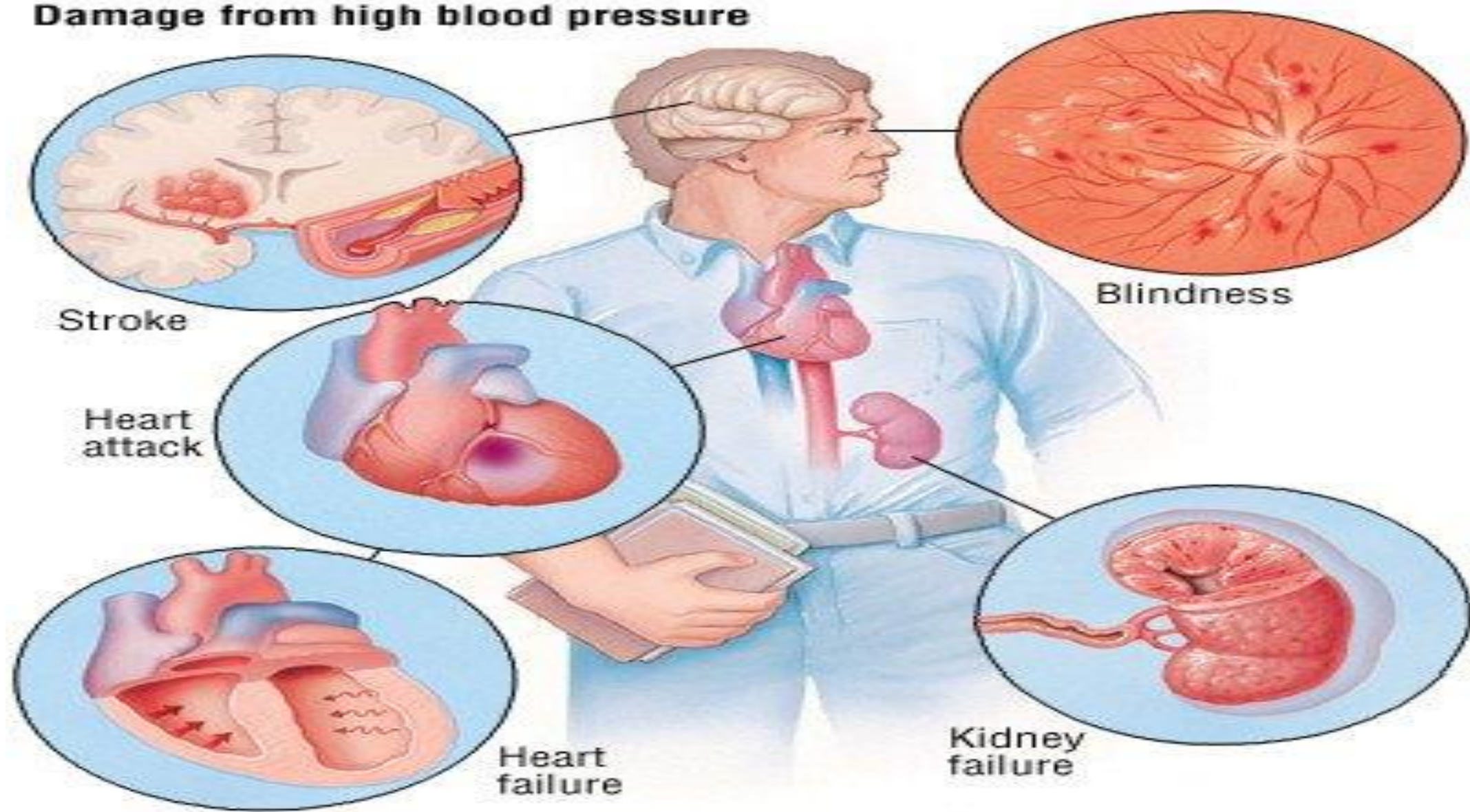


**Low blood
pressure**



Fatigue

Damage from high blood pressure



Diagnostic tests

- Haemoglobin
- Fasting blood glucose
- Cholesterol profile
- Fasting serum triglycerides
- Kidney function tests
- Estimated glomerular filtration rate
- Urine analysis test
- 12 lead EKG
- Hemoglobin A1c
- Quantitative proteinuria
- ECG
- Holter monitoring
- Carotid ultrasound
- Pulse wave velocity
- Ankle-brachial index
- Ambulatory BP monitoring

Diagnostics for secondary hypertension

Causes	Physical examination	Laboratory findings	Tests
Renal parenchymal disease	Mass in abdomen	Presence of protein, erythrocytes, or leucocytes in the urine Decreased Glomerular Filtration Rate	Renal ultrasound All laboratory tests related to kidney
Renal artery stenosis	Abnormal sound (bruit) in the abdomen	Difference of >1.5 cm in length between the two kidneys Decrease in renal function	Renal doppler ultrasound, Magnetic resonance angiography, Spiral computed tomography
Primary aldosteronism	Arrhythmias	Hypokalemia, presence of adrenal masses	Estimation of aldosterone and renin ratio, oral sodium loading, Captopril tests, Adrenal CT scan.
Pheochromocytoma	Skin stigmata of neurofibromatosis	presence of adrenal or extra-adrenal masses	CT or MRI of the pelvis, Genetic screening for pathogenic mutations
Cushing syndrome	central obesity, moon-face, buffalo hump, red striae, hirsutism	Hyperglycaemia	24-hr urinary cortisol excretion, Dexamethasone-suppression test

Antihypertensive medications

Antihypertensive Medications

Medication Type	Example	Action
Diuretics	Furosemide, spironolactone, metolazone, polythiazide, hydrochlorothiazide	Lower blood pressure by reducing resorption of sodium and water by the kidneys, thus lowering circulating fluid volume
Beta-adrenergic blockers	Atenolol, nadolol, timolol maleate, metoprolol	Combines with beta-adrenergic receptors in the heart, arteries, and arterioles to block response to sympathetic nerve impulses; reduces heart rate and thus cardiac output
Vasodilators	Hydralazine hydrochloride, minoxidil	Acts on arteriolar smooth muscle to cause relaxation and reduce peripheral vascular resistance
Calcium channel blockers	Diltiazem, verapamil hydrochloride, nifedipine, nicardipine	Reduces peripheral vascular resistance by systemic vasodilation
Angiotensin-converting enzyme (ACE) inhibitors	Captopril, enalapril, lisinopril, benazepril	Lowers blood pressure by blocking the conversion of angiotensin I to angiotensin II, preventing vasoconstriction; reduces aldosterone production and fluid retention, lowering circulating fluid volume
Angiotensin-II receptor blockers (ARBs)	Losartan, olmesartan	Lowers blood pressure by blocking the binding of angiotensin II, which prevents vasoconstriction

Non-pharmacological management of hypertension

- **Reduced salt intake:**
- Take salt equal to the amount that is lost in a day.
- WHO recommended **<5 g** of salt in a day.
- American Society of Hypertension has recommended **3.8 g salt** use in a day.
- **Currently, an average of 9 g-12 g of salt is used in most countries.**

Dietary sodium
reduction

Reduce dietary sodium intake to no more than 100 mmol per day
(2.4 g sodium or 6 g sodium chloride).

2–8 mm Hg

Salt intake among Iranian population: the first national report on salt intake in Iran

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PMID: 30005027 DOI: 10.1097/HJH.0000000000001836

Abstract

Objective: In Iran, there has been no national report on salt intake based on laboratory measurements so far. Therefore, this study was conducted to measure salt intake among Iranian population at the national level.

Methods: In stepwise approach to conduct a surveillance survey 2016, 18 624 Iranian adults (25 years old and above), as a representative sample of Iranian adult population at national and subnational levels, underwent urine sodium measurement and were included in this study. The participants were recruited through a systematic random sampling from 30 provinces of Iran. For each individual, through a computer-assisted interview, a questionnaire on lifestyle risk factors was completed, all anthropometric indices were measured, and data on sodium of spot urine sample for all individuals and 24-h urine sample for a subsample were collected. To estimate the 24-h salt intake, common equations were used.

Results: In total, 97.66% of the population consumed at least 5 g of salt per day. In addition, in 41.20% of the population, the level of salt intake was at least two times higher than the level recommended by the WHO for adults. The mean of salt intake among Iranian population was 9.52 g/day (95% confidence interval: 9.48-9.56).

Conclusion: The study showed that the consumption of salt among the Iranian population is higher than the level recommended by WHO. To reduce salt intake, it is necessary to adopt a combination of nationwide policies such as food reformulation and food labelling.

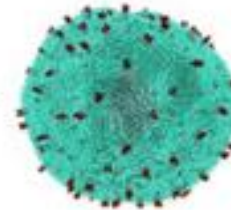
High Salt



Vascular dysfunction and pathological left ventricular hypertrophy



Renal dysfunction and impaired Na^+ handling



Skin Na^+ deposition, inflammation, and immune cell activation



Impaired cerebrovascular regulation and altered sympathetic outflow



Potential reduction in bone mineral density and content



■ Processed food
■ Naturally occurring
■ Added in home food prep
■ Added at table

Cont.

- **Increased potassium intake:**
- Healthy individuals need to take **4.7 g** of potassium in a day. An increase in potassium intake has been associated with lower blood pressure.
- The best strategy to **increase potassium intake** is by increasing the consumption of **fruits and vegetables**.

Cont.

- **Physical activity**
- Doing some **physical activities daily** also reduces blood pressure.
- Endurance training is also effective for hypertensive patients.
- A recent clinical trial suggests that **regular medium-intensity to high-intensity aerobic activity** reduced BP by a mean of 11/5 mmHg.
- **Weight loss**
- Excess adipose tissue in the body increases blood pressure. It has been found that obese patients require more antihypertensive drugs to control their blood pressure.
- **40% of Iranian adults (31.6% of men and 48.6% of women) belonged to the low physical activity category.**
- Approximately **15% of Iranian adults** (4.7 million people) **do not have any physical activity**

Table 32-3 • Lifestyle Modifications to Manage Hypertension*†

MODIFICATION	RECOMMENDATION	APPROXIMATE SBP REDUCTION (RANGE)
Weight reduction	Maintain normal body weight (body mass index 18.5–24.9 kg/m ²).	5–20 mm Hg/ 10 kg weight loss
Adopt DASH eating plan	Consume a diet rich in fruits, vegetables, and low-fat dairy products with a reduced content of saturated and total fat.	8–14 mm Hg
Dietary sodium reduction	Reduce dietary sodium intake to no more than 100 mmol per day (2.4 g sodium or 6 g sodium chloride).	2–8 mm Hg
Physical activity	Engage in regular aerobic physical activity such as brisk walking (at least 30 min per day, most days of the week).	4–9 mm Hg
Moderation of alcohol consumption	Limit consumption to no more than 2 drinks (1 oz or 30 mL ethanol; e.g., 24 oz beer, 10 oz wine, or 3 oz 80-proof whiskey) per day in most men and to no more than 1 drink per day in women and lighter-weight persons.	2–4 mm Hg

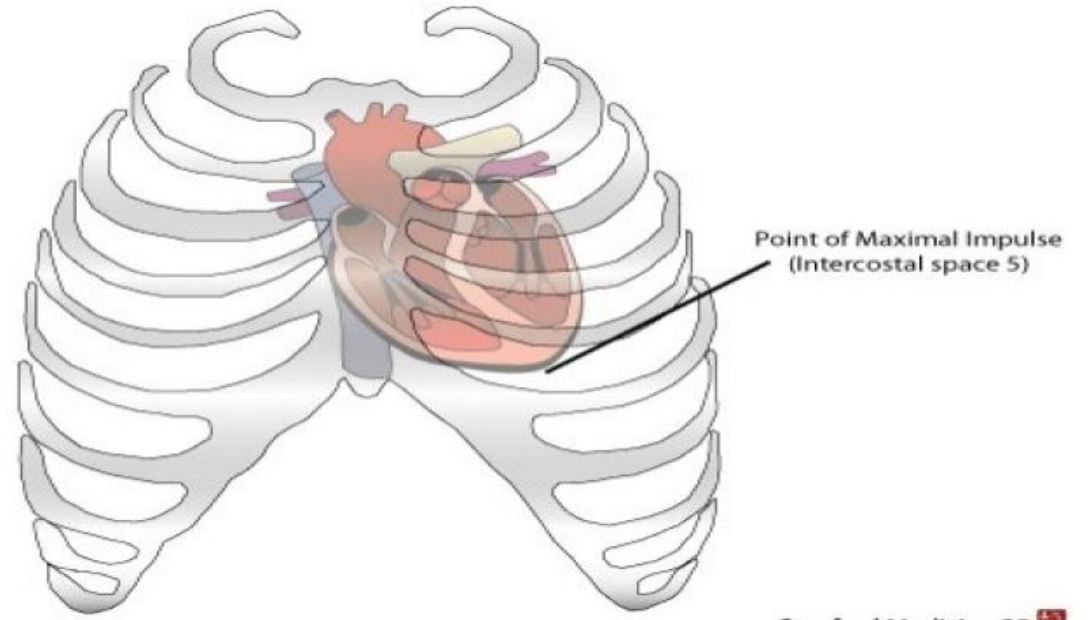
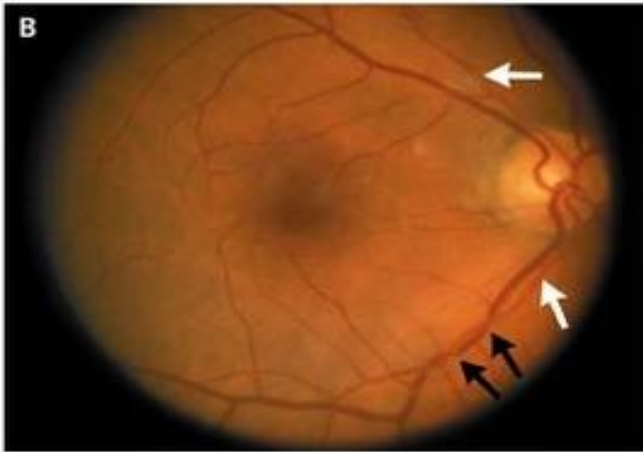
Nursing management on hypertension:

Nursing Assessment for hypertension

- **Get information from the patients about the following:**
- **Family history of having high blood pressure**
- Previous episodes of blood pressure
- Dietary habits and amount of salt intake
- Cigarette smoking
- If the patient is taking any of medications such as steroids, hormonal contraceptives, NSAIDS, nasal decongestants, antidepressants, etc.
- If the patient has certain conditions like gout, migraine, asthma, heart failure, benign prostatic hyperplasia.

Cont.

- **Physical examinations in Hypertension**
- Check **pulse rate and auscultate heart sound**.
- If possible, do a **fundoscopic examination** of the eyes to find out any vascular changes.
- Examine the heart for a **shift of the point of the maximal impulse** to the left. It mostly occurs in **heart enlargement**.
- Check for **bruits over peripheral arteries** to find out the presence of atherosclerosis.
- Do a **mental status examination** to determine any changes in memory, concentration or ability to perform simple mathematical calculations.

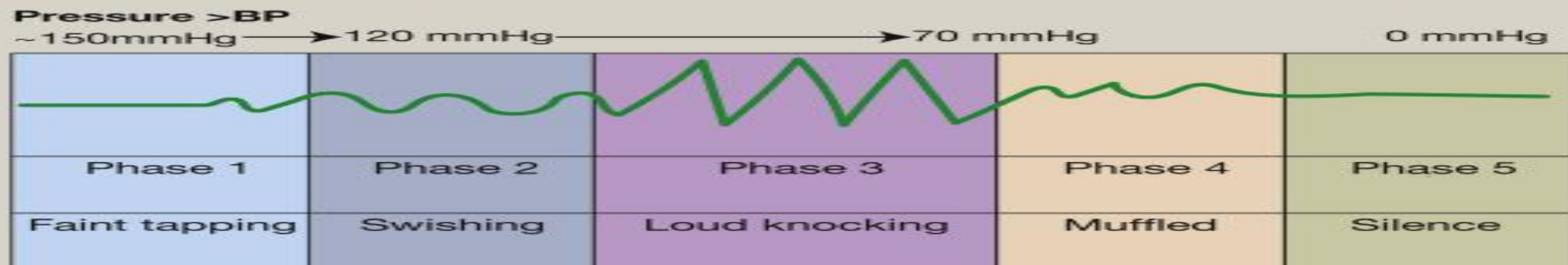


Measures to be followed while taking blood pressure



- Each time blood pressure should be measured **at the same conditions**.
- Do not take blood pressure after **stressful situations**.
- **Give 30 minutes gap** to measure blood pressure after smoking.
- Provide a **comfortable position** to the patient and ask him to remain silent at the time of taking blood pressure.
- Use **appropriate size of BP cuff**.
- The cuff inside the **BP cuff must cover 80% of the patient's hand** after encircling.
- If consecutive reading is required, **give at least 2 minutes gap between two readings**.
- Auscultation of the **systolic and diastolic** has five phases.

The five phases of blood pressure measurement via auscultation



Nursing intervention for providing basic health education on Hypertension

- Explain the **meaning of hypertension**, its risk factors, and its effect on cardiovascular, cerebral, and renal systems.
- Clearly explain to the **patient and family member** that **hypertension can never be totally cured**, it can only be controlled.
- Make the patient understand, **hypertension is a chronic condition**. It requires **regular therapy and periodical check-up**.
- **Sticking to the treatment** will improve **life expectancy**.
- Explain a **coordinated and complementary plan** to the patient
- **Explain to the patient before each diagnostic and therapeutic procedure to minimize the anxiety.**

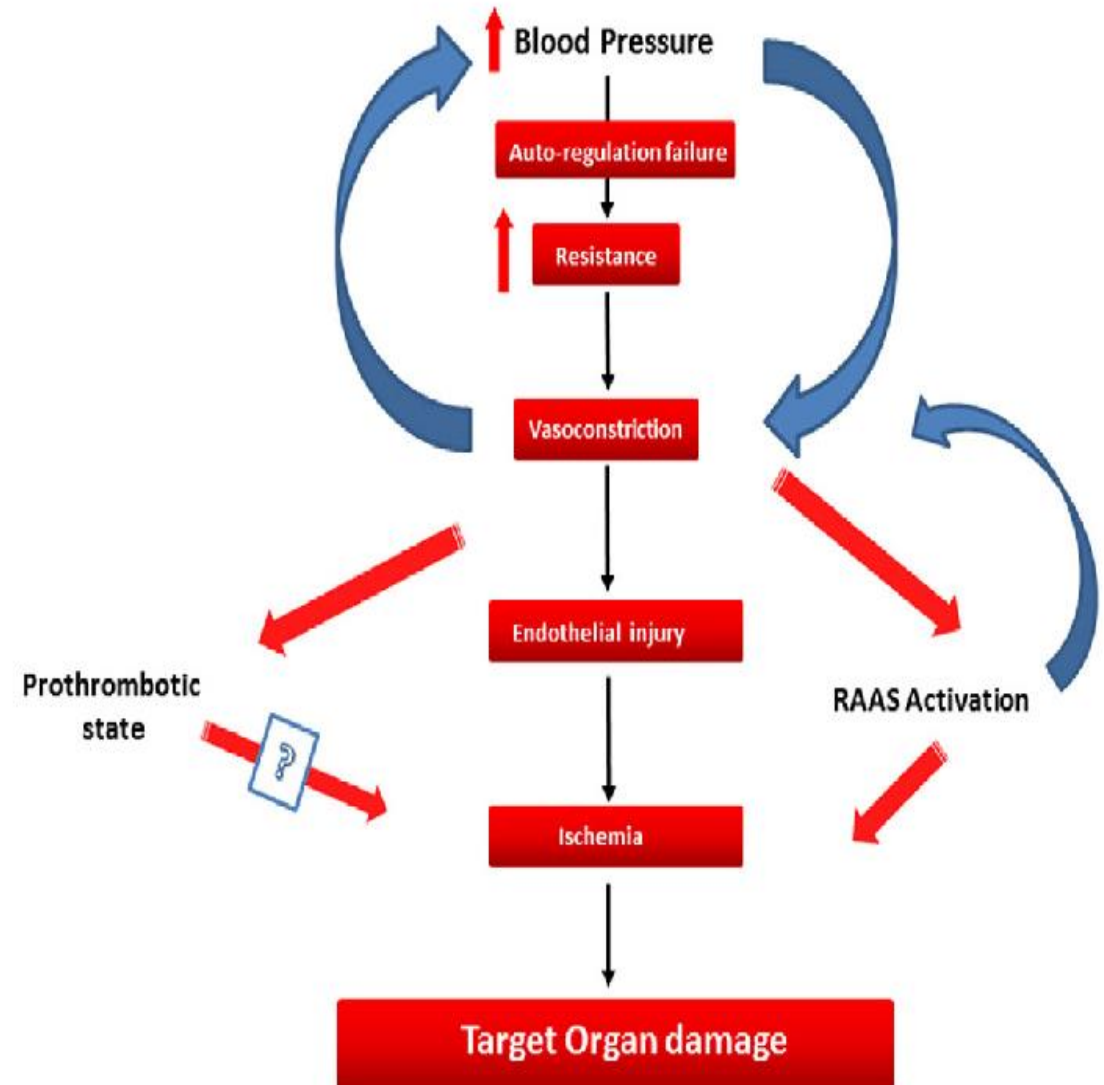
Cont.

- **Involve the family, friends** and clearly explain to them about the treatment plan.
- Explain to the **patient the therapeutic effects and adverse effects of the antihypertensive drugs.**
- Warn the patient about **orthostatic hypertension** may occur during **initiation of therapy.**
- For that instruct the patient, **not to walk or move after getting up immediately.** Take rest for some time before moving.
- Encourage the patient to **lie down when he/she feels fainting.**
- Provide information regarding **possible initial effects of some medications like anorexia, light-headedness, and fatigue.**
- Educate the patient that **dosages are different for different individuals.** It needs to be adjusted depending on the condition of the patient.
- Warn the patient regarding **vasodilating drugs.** Instruct not to take a hot bath, consume alcohol, moving in hot weather after taking the drug.

Nursing care management in crisis of HTN

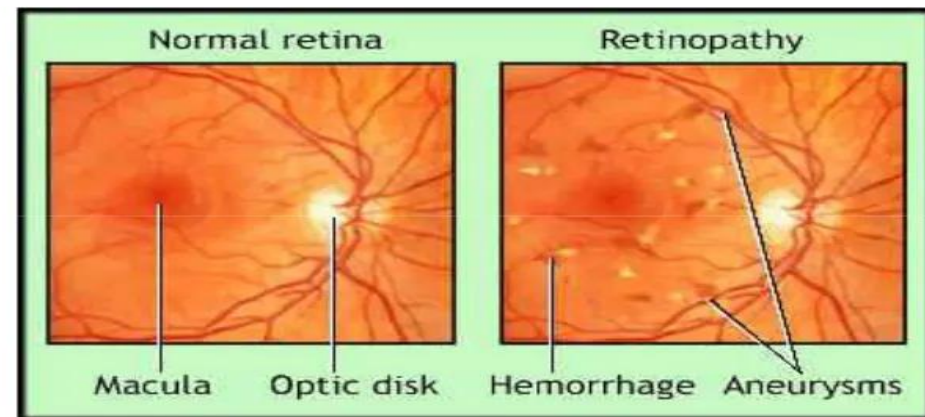
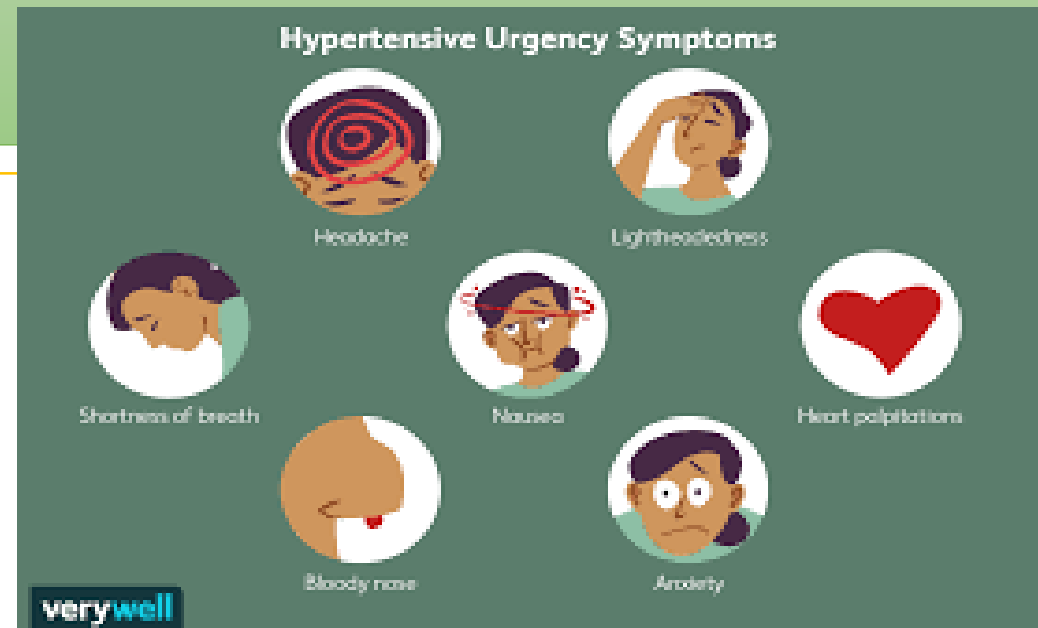
- A hypertensive emergency is an acute, marked elevation in blood pressure that is associated with signs of **target-organ damage**.
- These can include **pulmonary edema, cardiac ischemia, neurologic deficits, acute renal failure, aortic dissection, and eclampsia**

Hypertensive crisis: pathophysiology



Symptoms and signs of emergency high blood pressure

- Headache
- Visual blurring
- Dyspnea
- Chest pain
- Dizzy
- Anxiety
- Sense of doom




Nursing interventions

- Monitor **blood pressure frequently**. Know the target set by the physician
- Administer **antihypertensive medications** as prescribed
- Have **two large-bore IVs**
- Provide **oxygen if the saturations are low (less than 94%)**
- Limit **fluid intake** if the patient is in heart failure
- Assess **ECG to ensure the patient is not having a heart attack**
- Check report of the **chest x-ray to ensure the patient is not in heart failure**
- Listen to the **heart for murmurs and lungs for rales and crackles**

Cont.

- Check if the patient has edema
- Check renal function and electrolyte levels
- **Encourage rest and provide a quiet room**
- Educate the patient on how to lower stress
- Educate patient on a low salt diet, exercise, and healthy eating
- Educate the patient on the importance of taking antihypertensive medications

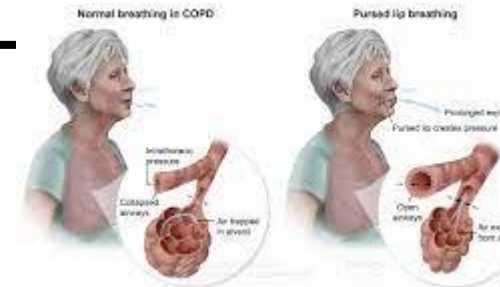
The effect of pursed-lip breathing combined with number counting on blood pressure and heart rate in hypertensive urgency patients: A randomized controlled trial

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Abstract

Hypertensive urgency (HT urgency) is an alarming sign of uncontrolled hypertension. It is aggravated by nonadherence to medication, as well as psychosocial stress. Mindfulness is beneficial for reducing stress, while deep and slow breathing is effective for lowering blood pressure (BP). In our study, we aimed to assess BP and heart rate effects in HT urgency patients practicing pursed-lip breathing and number counting (PLB with NC)—a practice that promotes mindfulness with deep/slow breathing patterns. In a randomized controlled trial, 110 patients were equally allocated to intervention and control groups. The intervention group was trained and encouraged to do PLB with NC during their emergency room admission, while the control group received conventional medical care. The mean systolic BP (SBP), diastolic BP (DBP), and HR of the intervention group in the 3rd hour were significantly lower than the baseline values at -28.2 mm Hg (95%CI;-23.5 to -32.4), -17.1 mm Hg (95%CI;-14.2 to -20.0), and -4.9 beats per minute (bpm) (95%CI;-4.0 to -5.8), respectively. In the control group, both the mean SBP and DBP were also significantly lower in the 3rd hour. However, HR reduction was inconclusive. When the two groups were compared, a greater degree of reduction was found in the intervention group for SBP (9.80 mm Hg, 95%CI; 4.10 to 15.50), DBP (7.69 mm Hg, 95%CI; 3.61 to 11.77), and HR (3.85 bpm, 95%CI; 1.99 to 5.72). In conclusion, PLB with NC was effective for lowering BP and HR. It might be used as a complementary treatment for HT urgency patients.



Shree Hospital

Nursing care in Antihypertensive drugs

MEDICATIONS	MAJOR ACTION	Advantage and contraindication	Nursing notes
sodium nitroprusside (Nipride, Nitropress) nitroglycerin (Nitro-Bid IV, Tridil) diazoxide (Hyperstat)	Peripheral vasodilation by relaxation of smooth muscle	Fast-acting Used only in hypertensive emergencies <u>Contraindications:</u> Sepsis, azotemia, high intracranial pressure.	Dizziness, headache, nausea, edema, tachycardia, palpitations. Can cause thiocyanate and <u>cyanide intoxication</u>

Cont.

MEDICATIONS	MAJOR ACTION	Advantage and contraindication	Nursing notes
Angiotensin-Converting Enzyme (ACE) Inhibitors benazepril (Lotensin) captopril (Capoten) enalapril (Vasotec) enalaprilat (Vasotec IV) lisinopril (Prinivil, Zestril) moexipril (Univasc) perindopril (Aceon) quinapril (Accupril) ramipril (Altace) trandolapril (Mavik)	Inhibit conversion of angiotensin I to angiotensin II Lower total peripheral resistance	Fewer cardiovascular side effects Can be used with thiazide diuretic and digitalis Hypotension can be reversed by fluid replacement. Contraindications: Renal impairment, pregnancy	Gerontologic Considerations: Require reduced dosages and the addition of loop diuretics when there is renal dysfunction

Cont.

MEDICATIONS	MAJOR ACTION	Advantage and contraindication	Nursing notes
Angiotensin II Antagonists candesartan (Atacand) eprosartan (Teveten) irbesartan (Avapro) losartan (Cozaar) olmesartan (Benicar) telmisartan (Micardis) valsartan (Diovan)	Block the effects of angiotensin II at the receptor Reduce peripheral resistance	Minimal side effects Contraindications: Pregnancy, renovascular disease	Monitor for hypokalemia

Cont.

MEDICATIONS	MAJOR ACTION	Advantage and contraindication	Nursing notes
Calcium Channel blockers Nondihydropyridines diltiazem hydrochloride (Cardizem SR, Cardizem CD, Dilacor XR, Tiazac) diltiazem long-acting (Cardizem LA)	Inhibits calcium ion influx Reduces cardiac afterload	Inhibits coronary artery spasm not controlled by beta-blockers or nitrates Contraindications: Sick sinus syndrome; AV block; hypotension; heart failure	<i>Do not discontinue suddenly.</i> Observe for hypotension. Report irregular heartbeat, dizziness, edema. Instruct on regular dental care because of potential gingivitis.

Cont.

MEDICATIONS	MAJOR ACTION	Advantage and contraindication	Nursing notes
verapamil immediate release (Calan, Isoptin) verapamil long-acting (Calan SR, Isoptin SR) verapamil-Coer (Covera HS, Verelan PM)	Inhibits calcium ion influx Slows velocity of conduction of cardiac impulse	Effective antiarrhythmic Rapid IV onset Blocks SA and AV node channels Contraindications: Sinus or AV node disease; severe heart failure; severe hypotension	Administer on empty stomach or before meal. Do not discontinue suddenly. Depression may subside when medication is discontinued. To relieve headaches, reduce noise, monitor electrolytes. Decrease dose for patients with liver or renal failure.

Cont.

MEDICATIONS	MAJOR ACTION	Advantage and contraindication	Nursing notes
Dihydropyridines amlodipine (Norvasc) felodipine (Plendil) isradipine (DynaCirc CR) nicardipine sustained release (Cardene SR) nifedipine long-acting (Adalat CC, Procardia XL) nisoldipine (Sular)	Inhibit calcium ion influx across membranes Vasodilating effects on coronary and peripheral arteriole Decrease cardiac work and energy consumption , increase delivery of oxygen to myocardium	Rapid action Effective by oral or sublingual route No tendency to slow SA nodal activity or prolong AV node conduction Isolated systolic hypertension Contraindications: None (except heart failure for nifedipine)	Administer on empty stomach. Use with caution in diabetic patients. Small frequent meals if nausea . Muscle cramps, joint stiffness, sexual difficulties may disappear when dose decreased. Report irregular heartbeat, constipation, shortness of breath, edema. May cause dizziness

Research results

Meta-Analysis

> J Hypertens. 2021 Jan;39(1):23-37. doi: 10.1097/HJH.0000000000002604.

The effect of plant-based dietary patterns on blood pressure: a systematic review and meta-analysis of controlled intervention trials

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PMID: 33275398 DOI: 10.1097/HJH.0000000000002604

Abstract

Objectives: The consumption of strict vegetarian diets with no animal products is associated with low blood pressure (BP). It is not clear whether less strict plant-based diets (PBDs) containing some animal products exert a similar effect. The main objective of this meta-analysis was to assess whether PBDs reduce BP in controlled clinical trials.

Methods: We searched Cumulative Index to Nursing and Allied Health Literature, Medline, Embase, and Web of Science to identify controlled clinical trials investigating the effect of PBDs on BP. Standardized mean differences in BP and 95% confidence intervals were pooled using a random effects model. Risk of bias, sensitivity, heterogeneity, and publication bias were assessed.

Results: Of the 790 studies identified, 41 clinical trials met the inclusion criteria (8416 participants of mean age 49.2 years). In the pooled analysis, PBDs were associated with lower SBP [Dietary Approach to Stop Hypertension -5.53 mmHg (95% confidence intervals -7.95,-3.12), Mediterranean -0.95 mmHg (-1.70,-0.20), Vegan -1.30 mmHg (-3.90,1.29), Lacto-ovo vegetarian -5.47 mmHg (-7.60,-3.34), Nordic -4.47 mmHg (-7.14,-1.81), high-fiber -0.65 mmHg (-1.83,0.53), high-fruit and vegetable -0.57 mmHg (-7.45,6.32)]. Similar effects were seen on DBP. There was no evidence of publication bias and some heterogeneity was detected. The certainty of the results is high for the lacto-ovo vegetarian and Dietary Approach to Stop Hypertension diets, moderate for the Nordic and Mediterranean diets, low for the vegan diet, and very low for the high-fruit and vegetable and high-fiber diets.

Conclusion: PBDs with limited animal products lower both SBP and DBP, across sex and BMI.

Cont.

Review

> [Int J Environ Res Public Health](#). 2021 Jul 29;18(15):8008. doi: 10.3390/ijerph18158008.

Factors Associated with Mortality among Elderly People in the COVID-19 Pandemic (SARS-CoV-2): A Systematic Review and Meta-Analysis

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Meta-analysis of factors associated (quantitative variables) with mortality.

Variables	RR (95% CI)	I ²	Z	p-Value
Male	0.98 (0.67; 1.43)	89.3	0.10	0.919
Chronic diseases	1.20 (0.94; 1.54)	-	1.48	0.139
Cancer	1.60 (0.60; 4.23)	-	0.92	0.356
Diabetes	<u>1.90 (1.53; 2.37)</u>	62.7	5.73	<0.001
Cardiovascular diseases/coronary artery disease	1.80 (0.85; 3.80)	92.0	1.53	0.125
COPD ¹	2.19 (1.54; 3.10)	0.0	4.39	<u><0.001</u>
Immunodeficiencies	5.28 (0.26; 108.12)	-	1.08	0.280
Chronic kidney disease	<u>3.96 (2.65; 5.91)</u>	0.0	6.73	<u><0.001</u>
Metabolic disease	1.51 (0.60; 3.75)	-	0.89	0.374
Obesity	1.28 (0.78; 2.10)	60.8	0.99	0.322
<u>Hypertension</u>	<u>1.37 (1.24; 1.51)</u>	69.3	6.25	<u><0.001</u>
FH ²	3.27 (2.49; 4.29)	-	8.55	<0.001
Dementia	3.67 (2.43; 5.55)	-	6.17	<0.001
Smoking	0.74 (0.32; 1.71)	-	0.70	0.483

Abstract

The objective of this meta-analysis was to evaluate the factors associated with the mortality of elderly Italians diagnosed with coronavirus who resided in institutions or who were hospitalized because of the disease.

Methods: A systematic review following the recommendations of The Joanna Briggs Institute (JBI) was carried out, utilizing the PEO strategy, i.e., Population, Exposure and Outcome. In this case, the population was the elderly aged over 65 years old, the exposure referred to the SARS-CoV-2 pandemic and the outcome was mortality. The National Center for Biotechnology Information (NCBI/PubMed), Latin American and Caribbean Literature in Health Sciences (LILACS), Excerpta Medica Database (EMBASE) and Cumulative Index to Nursing and Allied Health Literature (CINAHL) databases were used until 31 July 2020.

Results: Five Italian studies were included in this meta-analysis, with the number of elderly people included varying between 18 and 1591 patients. The main morbidities presented by the elderly in the studies were dementia, diabetes, chronic kidney disease and hypertension.

Conclusions: The factors associated with the mortality of elderly Italian people diagnosed with SARS-CoV-2 who lived in institutions or who were hospitalized because of the disease were evaluated. It was found that dementia, diabetes, chronic kidney disease and hypertension were the main diagnosed diseases for mortality in elderly people with COVID-19.

Keywords: COVID-19; SARS-CoV-2; clinical features; institutionalized or hospitalized elderly; meta-analysis; non-communicable chronic diseases (NCCDs).

Meta-Analysis

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A systematic review and meta-analysis on the effectiveness of education on medication adherence for patients with hypertension, hyperlipidaemia and diabetes

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Abstract in English, [Chinese](#)

Aim: To evaluate the effectiveness of educational interventions in improving medication adherence among adult patients diagnosed with hypertension, hyperlipidaemia and/or diabetes.

Design: This review was conducted with reference to methods set out in the Cochrane Handbook for Systematic Reviews of Interventions (PROSPERO registration number: CRD42016053402).

Data sources: A search from seven electronic databases (2003-2016).

Review method: The quality of evidence and strength of the studies was evaluated systematically, followed by an assessment of risks of bias by two reviewers with the Cochrane Collaboration's tool.

Results: Eighteen randomized controlled trials demonstrated a low to moderate quality evidence on the improvements of medication adherence with educational interventions. Participants with type 2 diabetes benefited from education interventions but not those with hypertension. No randomized controlled trials (RCT) was found for participants with hyperlipidaemia. Education that was conducted at home showed better medication adherence than education conducted in clinics. Medication adherence was improved after two to three sessions but no significant differences found after three sessions.

Conclusion: Through education, health literacy is improved, thus improving medication adherence.

Impact: A plethora of educational interventions have been implemented in the clinical settings, but no reviews have hitherto been conducted on their effectiveness. This review suggested that education improves health literacy which is directly proportionate to optimal disease management including medication adherence. The suggestions proposed in this review may impact the individual in terms of their adherence to medication to tackle exacerbation and relapse of chronic diseases and also proposed suggestions for future implementation of an education intervention.

Review > Medicine (Baltimore). 2019 Mar;98(9):e14707. doi: 10.1097/MD.00000000000014707.

The effect of remote health intervention based on internet or mobile communication network on hypertension patients: Protocol for a systematic review and meta-analysis of randomized controlled trials

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Abstract

Background: To systematically review the impact of remote health interventions based on an internet or mobile communication network on patients with hypertension and to provide a theoretical basis for hypertension patients with the implementation of remote health interventions.

Methods: Data were retrieved from a total of 4 Chinese databases and 3 foreign databases. The Chinese databases included: China National Knowledge Infrastructure (CNKI), WanFang Data, Chinese Biomedical Database (SinoMed), and Chongqing Chinese Science and Technology Journey database (VIP). The foreign language databases included PubMed, The Cochrane Library, and EMBASE, and the date range for the search was from the date the database became active to December 1, 2018. After screening and extracting the materials and evaluating the risk of bias in each study (conducted by 2 researchers), the quality of the selected literature was evaluated by Review Manager (RevMan) [Computer program]. Version 5.3. Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2014, and the statistical analysis was applied by Stata 12.0 software.

Result: This study will provide high-quality evidence-based medicine research evidence for remote health interventions on hypertensive patients based on the Internet and mobile communication network using systematic evaluation and meta-analysis methods.

Conclusion: This systematic review will provide a scientific conclusion as to whether the remote health intervention model based on an internet or mobile communication network can better control blood pressure and improve patient compliance than the traditional nursing intervention model for hypertensive patients.

Good luck
Any question?