

# Knowledge, awareness, attitude and medication compliance in patients with hypertension

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## Abstract

**Background:** Recognition of the importance of systolic blood pressure (SBP) level has been considered as one of the major public health challenges in the prevention and treatment of hypertension HTN. Studies indicate that most of the patients with HTN don't control the SBP. The purpose of the study was to assess the patients' knowledge, awareness and attitude towards HTN, especially related to SPB and their compliance with antihypertensive treatment.

**Material and methods:** The quantitative, descriptive, cross-sectional study has been conducted and Morisky Medication Adherence Scale was used.

**Results:** Most of patients have sufficient general knowledge about HTN. However, they know less about the specific factors associated with their disease, in particular: 77% of patients were unaware about their systolic blood pressure (SBP) at the time of HTN diagnosis and 75% — at the last visit to the doctor. The main reasons for the patient low compliance with treatment were low availability of medicines due to high costs (n = 44; 22%), daily chores that prevent from taking medication continuously at the proper time (n = 32; 16%), forgetfulness of taking medications (n = 24, 12%).

**Conclusions:** Recognition of the importance of SBP level has been considered as one of the major challenges of public health and medicine in the prevention and treatment of HTN. The study emphasizes the necessity to maximize the effectiveness of HTN prevention and control programs to achieve optimal control of SBP.

**Key words:** hypertension; systolic blood pressure; patient awareness

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## Introduction


Improving public knowledge and awareness of hypertension (HTN), its early identification, proper treatment and control significantly reduces the mortality rate caused by cardiovascular diseases [1–4]. In many countries, national high systolic blood pressure (SPB) education programs have been introduced to improve public knowledge and awareness of HTN

[5], through which significant positive results were achieved [6, 7].

Recognition of the importance of SBP level has been considered as one of the major public health challenges in the prevention and treatment of HTN [8]. Despite of improving general knowledge and awareness, some studies indicate that most of the patients with HTN don't control the SBP [9–11] and have poor drug compliance [12].

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The purpose of the study was to assess the patients' knowledge, awareness and attitude towards HTN, especially related to SPB and their compliance with antihypertensive treatment.

## Material and methods

Quantitative, descriptive, cross-sectional research has been conducted at outpatient departments in Chapidze Emergency Cardiology Center and in Caucasus Medical Centre, which are one of the largest cardiology medical institutions in Georgia.

A non-probabilistic random sampling technique was used. A total of 247 participants were approached; 112 in Chapidze Emergency Cardiology Center, 135 in cardiology department in Caucasus Medical Centre. Of the total participants who were approached and who consented, 200 patients with HTN were found eligible; 92 (46%) from Chapidze Emergency Cardiology Center, 108 (54%) from cardiology department in Caucasus Medical Centre. Overall response rate was 81%.

HTN was determined at  $\geq 140/90$  mm Hg using the standardized measurement method at least twice. There were included patients with a SBP higher than 140 mm Hg and a diastolic blood pressure (DBP) of more than 90 mm Hg. Patients with pregnancy, under the age of 18 and with mental disorder were excluded from the study.

The research tool consisted of a pre-structured questionnaire, developed by using the existing literature to assess the knowledge and awareness of hypertensive patients [13]. Some changes were made while compiling the questionnaire, taking into account the local culture and environment. Patients who met the inclusion criteria were interviewed to assess their knowledge and awareness of HTN.

The Morisky Medication Adherence Scale was used to study behavior related to patients' compliance with treatment [14]. The Morisky Medication Adherence Scale consists of 8-point questions (never/rarely/sometimes/often/always) and open-ended questions about the reasons for not following the treatment plan. The score range of scale contained low ( $< 6$ ), medium (6 to  $< 8$ ) and high patient compliance with treatment ( $= 8$ ). The study was conducted during October–December 2020.

The ethical clearance was obtained from Ethical Committee of Caucasus University. The questionnaire was accompanied by instruction and description that the survey was anonymous, patients and doctors did not indicate the personal data for not being identified (name, surname, personal number and other data).

The data collected during the study were analyzed using 23<sup>th</sup> version of the IBM SPSS program.

## Results

The data on major demographic and HTN risk factors are shown in Table 1.

Patients' awareness and knowledge about HTN are shown in Tables 2 and 3. The results show that

**Table 1.** Demographic data and risk factors in patients with hypertension (HTN)

Variables	
<b>Sex</b>	
Man	105 (52%)
Female	95 (48%)
<b>Age [years]</b>	
30–39	27 (13.6%)
40–49	45 (22.6%)
50–59	63 (31.7%)
60–70	44 (22.1%)
> 70	20 (10.1%)
<b>Education</b>	
Incomplete secondary education	39 (19.8%)
Secondary education	68 (34.5%)
Higher education	90 (45.7%)
<b>Body mass index [kg/m<sup>2</sup>] (body weight/body height)</b>	
Normal	64 (32%)
Overweight	80 (40%)
Obesity	56 (28%)
<b>Alcohol consumption [mL/day]</b>	
Does not consume (0 or sometimes)	64 (32.2%)
Moderate consumption (1–100)	79 (39.7%)
High consumption (> 100)	56 (28.1%)
<b>Physical exercises</b>	
Low	87 (43.7%)
Moderate	79 (37.7%)
High	33 (16.6%)
<b>Tobacco consumption</b>	
Non-smoker (0)	85 (43.1%)
Smoker (> 1)	112 (56.9%)
<b>Blood cholesterol [mmol/L]</b>	
Normal (5.2)	57 (28.6%)
Borderline (5.2–6.5)	93 (46.7%)
High (> 6.5)	49 (24.6%)
<b>SBP level indicator [mm Hg]</b>	
120/80	39 (19.6%)
130/85	71 (35.7%)
140/90	56 (28.1%)
160/95	29 (14.6%)
<b>Duration of HTN</b>	
1–5 years	55 (27.8%)
5–10 years	90 (42.4%)
> 10 years	55 (27.8%)

**Table 2.** Patients' awareness of hypertension (HTN)

Patient awareness of HTN	Yes	%	no	%
Normal SBP level is 120/80 mm Hg	142	71	58	29
SBP increase > 140/90 means HTN	140	70	60	30
SBP is the pressure during the heart's contraction	142	71	58	29
DBS is the pressure in the period between heartbeats	104	52	96	48
SBP increases with aging	132	66	68	34
Both women and men have equal chances of developing HTN	102	51	98	49
Genetic traits of HTN increases HTN development risk	146	73	54	27
Tobacco consumption increases HTN development risk	130	65	70	35
Alcohol consumption increases HTN development risk	144	72	56	28
Intake of large amounts of table salt increases HTN development risk	144	72	56	28
Intake of fatty food increases HTN development risk	126	63	74	37
Obesity increases HTN development risk	152	76	48	24
Stress increases HTN development risk	120	60	80	40
Frequent fast-food consumption (for example, McDonald's, KFC) increases SBP	134	67	66	33
Sedentary lifestyle increases HTN development risk	128	64	72	36
HTN can lead to a life-threatening condition	126	63	74	37
Adherence to antihypertensive treatment	148	74	52	26
Regular physical exercises help to normalize SBP	136	68	64	32
Healthy diet helps to normalize SBP	124	62	76	38
Not paying attention at high SBP can lead to development of stroke, heart attack or heart failure	138	69	62	31

**Table 3.** Patients' knowledge about hypertension (HTN)

Patients' knowledge about HTN	Yes	%	No.	%
I know I have HTN	170	85	30	15
When I was diagnosed with HTN, I had already knew about my SBP level	46	23	154	77
I know my SBP level	110	55	90	45
SBP control reduces disease complications	130	65	70	35
Uncontrolled HTN can lead to organ damage	92	46	108	54
During my last visit to the doctor, I knew my SBP level	50	25	150	75
I think, HTN is a curable disease	180	90	20	10
I think, lifestyle changes reduce HTN development	132	66	68	34
My SBP has been improved over the past year	146	73	54	27

66% of patients had sufficient knowledge about HTN; however, 77% of them were unaware of their SBP at the time of HTN diagnosis, 45% were unaware of their SBP level and 74% felt that to take medication is essential for blood pressure control.

Patients were interviewed for their compliance with treatment of HTN (Tab. 4). The results showed that 43% of patients sometimes forgot to take the medication and 26% sometimes purposely did not take prescribed medication. Patients were asked to specify the reasons for their

non-compliance with HTN treatment (Tab. 5). The main reasons were: shortage of medicines ( $n = 44$ ; 22%), daily chores that prevented them from taking medication continuously at the proper time ( $n = 32$ ; 16%), forgetfulness of taking medicines ( $n = 24$ , 12%).

The study has showed a correlation between the patient age and awareness of HTN ( $p = 0.016 < 0.05$ ). Family members and friends were named as the main sources of getting information. (Tab. 6)

The study has showed a correlation between the alcohol consumption, tobacco consumption and ge-

**Table 4.** Compliance with treatment in hypertensive patients

Patient compliance with hypertensive medication	Yes	%	No.	%
Do you sometimes forget to take medication?	86	43	114	57
Sometimes people deliberately do not take prescribed medications. Is this also a case for you? In the past two weeks, have you deliberately missed any medication?	52	26	148	74
Have you ever stopped or changed taking prescribed medication without consulting a doctor?	24	12	176	88
When going somewhere and leaving the house (e.g., travel), have you ever forgotten to take your medication?	50	25	150	75
Did you take the medication yesterday?	156	78	44	22
When you feel that your health is under control and you feel much better, have you stopped taking the medication?	26	13	174	87
Some people do not believe that it's necessary to take medication every day. Have you ever felt being frustrated because of following a treatment plan?	28	14	172	86

**Table 5.** The main reasons for the low patient compliance with hypertension (HTN) treatment plan

From your point of view, what is the reason that sometimes you do not follow HTN treatment plan?	N	%
Insufficient knowledge about the disease and long-term treatment neglect	14	7
Adverse reactions to medications	18	9
I do not believe, that health improvement is depended on medical treatment	16	8
I have a fear of taking medication	12	6
Forgetfulness, sometimes I forget taking medication	24	12
Medication shortages, sometimes medications are out of stock at pharmacies	44	22
Lacking communication with the doctor, lack of awareness about the treatment	14	7
Prescribing medication is associated with costs (doctor's fee, transportation costs to the doctor)	26	13
Some medications are too expensive and I cannot afford to buy them	28	14
Daily chores, that prevent from taking medication continuously at the proper time	32	16
Lack of reminder	20	10
I'm busy with work and sometimes I do not take the medication	20	10
I'm away from home on weekends or I'm on vacation and sometimes I cannot take the medication	18	9
I have to take too many medications and sometimes I skip some of them	22	11

**Table 6.** Relation between patient's age and awareness of hypertension (HTN)

Age		Information sources about HTN					Total
		Family members	Acquaintances, friends	Mass media	Medical books	Doctor	
30–39	Count	13	6	3	1	5	28
	%	46.4%	21.4%	10.7%	3.6%	17.9%	100.0%
40–49	Count	6	18	13	3	5	45
	%	13.3%	40.0%	28.9%	6.7%	11.1%	100.0%
50–59	Count	8	22	18	7	8	63
	%	12.7%	34.9%	28.6%	11.1%	12.7%	100.0%
60–70	Count	15	9	13	6	1	44
	%	34.1%	20.5%	29.5%	13.6%	2.3%	100.0%
> 70	Count	7	6	4	0	3	20
	%	35.0%	30.0%	20.0%	0.0%	15.0%	100.0%
Total	Count	49	61	51	17	22	200
	%	24.5%	30.5%	25.5%	8.5%	11.0%	100.0%

**Table 7.** Correlation between hypertension (HTN) development risks and education level

	Incomplete secondary	Secondary	Higher	Overall
<b>Alcohol consumption increases HTN development risk</b>				
Yes	19 (48.7%)	22 (31.9%)	57 (62%)	98 (49%)
No	11 (28.2%)	38 (55.1%)	21 (22.8%)	70 (35%)
Don't know	9 (23.1%)	9 (13%)	14 (15.2%)	32 (16%)
Total	39 (100%)	69 (100%)	92 (100%)	200 (100%)
<b>Tobacco consumption increases HTN development risk</b>				
Yes	18 (46.2%)	35 (50.7%)	47 (51.1%)	100 (50%)
No	10 (25.6%)	24 (34.8%)	25 (27.2%)	59 (29.5%)
Don't know	11 (28.2%)	10 (14.5%)	20 (21.7%)	41 (20.5%)
Total	39 (100%)	69 (100%)	92 (100%)	200 (100%)
<b>Genetic traits of HTN increases HTN development risk</b>				
Yes	20 (51.3%)	20 (29%)	50 (54.3%)	90 (45%)
No	8 (20.5%)	32 (46.4%)	14 (15.2%)	54 (27%)
Don't know	11 (28.2%)	17 (24.6%)	28 (30.4%)	56 (28%)
Total	39 (100%)	69 (100%)	92 (100%)	200 (100%)

**Table 8.** Correlation between the level of blood cholesterol and the body mass index (BMI)

	Blood cholesterol [mmol/L] Normal 5.2	Borderline (5.2–6.5)	High 6.5+	Total
<b>BMI [kg/m<sup>2</sup>] (body weight/squared body height)</b>				
18–24	31 (53.4%)	22 (23.7%)	11 (22.4%)	64 (32.0%)
25–30	18 (31.0%)	44 (47.3%)	18 (36.7%)	80 (40.0%)
30+	9 (15.5%)	27 (29.0%)	20 (40.8%)	56 (28.0%)
Total	58 (100%)	93 (100%)	49 (100%)	200 (100%)
<b>Intake of fatty food increases HTN development risk</b>				
Yes	36 (62.1%)	37 (39.8%)	20 (40.8%)	93 (46.5%)
No	14 (24.1%)	41 (44.1%)	20 (40.8%)	75 (37.5%)
I do not know	8 (13.8%)	15 (16.1%)	9 (18.4%)	32 (16.0%)
Total	58 (100.0%)	93 (100.0%)	49 (100.0%)	200 (100.0%)

netic predisposition to HTN development and education level. Most patients with higher education are aware of HTN development risk as a result of both alcohol ( $n = 57$ ; 62%) and tobacco consumption ( $n = 47$ ; 51.1%) and genetic predisposition ( $n = 50$ ; 54.3%). Thus, education level plays an important role in the treatment of HTN and patient behavior ( $p = 0.025 < 0.05$ ) (Tab. 7).

The study has showed a correlation between the blood cholesterol level and the body mass index ( $p = 0.0001 < 0.05$ ). The higher body mass index means the higher blood cholesterol level (40.8%,  $n = 20$ , high cholesterol  $> 6.5$  mmol/L). The lower body mass index, the lower blood cholesterol (53.4%;  $n = 31$ , normal cholesterol 5.2 mmol/L).

The study has also showed that 62.1% of respondents ( $n = 36$ ) knew that the intake of fatty food is directly related to an increase in blood cholesterol; therefore, this small group had a normal blood cholesterol level of 5.2 mmol/L. However, according to

the results of the study, most of them were unaware of that dependence, respectively, 44.1% ( $n = 41$ ) had borderline blood cholesterol (5.2–6.5 mmol/L) and 40.8% ( $n = 20$ ) had high level (higher than 6.5 mmol/L) (Tab. 8).

The study has showed a correlation between patients' SBP levels and their physical exercise intensity level ( $p = 0.02 < 0.05$ ). The results clearly show that the SBP level and physical activity are inversely proportional to each other, with physical activity being low among all groups.

The study also showed a correlation between patients' SBP levels and the frequency of intake of large amounts of table salt ( $p = 0.003 < 0.05$ ). Patients with high SBP (160/85 mm Hg) had insufficient knowledge about the harmful effects of consuming large amounts of table salt (44.8%;  $n = 13$ ). Patients with relatively low SBP (120/80 mm Hg) (61.0%;  $n = 25$ ) were aware of the harmful effects of table salt (Tab. 9).

**Table 9.** Correlation between patients' systolic blood pressure (SBP) levels and their physical activity and intake of large amounts of table salt

	<b>Your SBP level: systolic/diastolic 120/80</b>	<b>130–85</b>	<b>140–90</b>	<b>160–85</b>	<b>All</b>
<b>Physical exercise intensity</b>					
Low	19 (46.3%)	25 (34.2%)	27 (47.4%)	17 (58.6%)	88 (44.0%)
Medium	17 (41.5%)	35 (47.9%)	19 (33.3%)	8 (27.6%)	79 (100%)
High	5 (12.2%)	13 (17.8%)	11 (19.3%)	4 (13.8%)	33 (16.5%)
Total	41 (100.0%)	73 (100.0%)	57 (100.0%)	29 (100.0%)	200 (100.0%)
<b>Intake of large amounts of table salt increases HTN development risk</b>					
Yes	25 (61.0%)	30 (41.1%)	26 (45.6%)	6 (20.7%)	87 (43.5%)
No	7 (17.1%)	30 (41.1%)	26 (45.6%)	13 (44.8%)	76 (38.0%)
I do not know	9 (22.0%)	13 (17.8%)	5 (8.8%)	10 (34.5%)	37 (18.5%)
Total	41 (100.0%)	73 (100.0%)	57 (100.0%)	29 (100.0%)	200 (100.0%)

## Discussion

Most of patients had sufficient general knowledge about HTN. They knew the importance of SBP in the development of a life-threatening condition (63%), that its control reduces the complications of the disease (65%) or the development of diseases such as stroke, heart attack or heart failure (69%). These results are consistent with the results of other studies [15, 16].

Regardless of general knowledge about HTN, patients were less aware of specific factors related to their disease status, in particular: 45% were unaware of their SBP levels, although the average duration of the HTN disease was amounted to 5–10 years; 29% were unaware of the normal SBP level or indicated, that the normal SBP is 140 mmHg or more. These results are consistent with the results of other studies [17, 18].

The studies confirm that knowledge of HTN is related to the control of SBP [19, 20]. SBP is one of the major risk factors for cardiovascular disease. In this regard, it is important to assess the extent to which patients are aware of the importance of controlling their SBP levels.

A significant proportion of the patients were unaware of their SBP at the time of HTN diagnosis (77%;  $n = 154$ ), and were unaware of their SBP at the last visit to the doctor (75%;  $n = 150$ ), so they mistakenly thought that their SBP was satisfactory. This confirms that patients were unaware of the importance of hypertension in the process of controlling SBP and were unable to classify accurately SBP levels. These results of the study show that patients' perceptions of their SBP levels do not reflect their actual levels.

Studies confirm the importance of awareness and knowledge about HTN and the potential impact of

SBP education programs. Patients who knew that an increase in SBP levels results in a reduction in life expectancy were more likely to adhere to a treatment regimen than the patients with low awareness [21, 22]. SBP control and patient compliance with treatment are achieved through education. In this regard, there is a need for medical staff to improve patients' education and awareness of the importance of high SBP levels.

The study showed that family members (24.5%;  $n = 22$ ), acquaintances (30.5%;  $n = 61$ ) and mass media (25.5%;  $n = 51$ ) were the main information sources for improvement of patients knowledge and awareness of HTN.

HTN can be controlled with lifestyle changes as well as taking medications. Pharmacological treatment of HTN reduces SBP, which has a positive effect on the cardiovascular system. Lifestyle changes to lower SBP include moderate tobacco and alcohol consumption, restriction of salt intake, regular physical exercises, healthy diet habits and weight loss. Lifestyle changes play a crucial role in reducing the number of medications both in hypertensive patients and also in preventing the HTN development in the whole population [23, 24].

Studies confirm that patients' low compliance with treatment is a fairly common and significant challenge that is a barrier to effective management of HTN and leads to ineffective treatment [25–27]. A significant proportion of patients sometimes forget to take medication (43%;  $n = 86$ ), and sometimes they do not take the prescribed medication on purpose (26%;  $n = 52$ ). The main reasons for the low patient compliance with treatment were low availability of medicines due to high costs ( $n = 44$ ; 22%), daily chores, that prevented them from taking medication continuously at the proper time ( $n = 32$ ; 16%), forgetfulness of taking medications ( $n = 24$ , 12%). The



study emphasizes the necessity to maximize the effectiveness of HTN prevention and control programs to achieve optimal control of SBP.

Adherence to antihypertensive treatment remains an important element in controlling hypertension [28]. Interventions to improve treatment adherence can be classified as informational, behavioral, or social [29]. Informational interventions use educational, cognitive tactics to increase patient understanding of their condition and its treatment. Behavioral interventions use influence techniques to change patient behaviors by modeling, reminding, or rewarding preferred behaviors. Social interventions recruit family members to assist the patient in improving medication adherence. Approaches may differ in intensity (individual, group), implementation methods (face-to-face, using technology), and essential specialists (physician, health personnel) [30].

## Conclusion, recommendations

The patients has sufficient knowledge about HTN, however they were less aware of their own disease status. Most patients have low compliance with treatment, which is due to the low availability, high cost of medicines, daily chores and forgetfulness of taking the medicines. The study emphasizes the necessity to maximize the effectiveness of HTN prevention and control programs.

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