

Research Article

Knowledge of disease condition and medications among hypertension patients in Lesotho



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Abstract

This study evaluated the levels of knowledge of hypertension and the associated medications among hypertension patients in Lesotho and assessed the significance of these indicators on hypertension treatment outcomes. About 81% (n = 212) of the patients had hypertension monocondition while the remaining had multiple chronic conditions. Seventy-six percent of the patients had uncontrolled hypertension. Nearly 36% had inadequate knowledge about hypertension while 44% had inadequate knowledge about their medicines. In total, 52.4% of the patients defaulted appointment dates while 64.6% failed to take their medications as prescribed at least once. Inadequate knowledge of antihypertensive medicines was significantly associated ($P = .028$) with having uncontrolled hypertension. Inadequate knowledge of antihypertensive medicines is an important determinant of uncontrolled hypertension. Improving the knowledge of hypertension and the associated medications is an important intervention required in this population. *J Am Soc Hypertens* 2016;10(1):41–46. © 2016 American Society of Hypertension. All rights reserved.

Keywords: Health literacy; Lesotho; non-communicable disease; uncontrolled hypertension.

Introduction

Noncommunicable diseases (NCDs) are among the leading causes of morbidity, disability, and mortality in the world despite public health efforts to improve the detection and management of these diseases.¹ Limited resources in developing countries such as Lesotho hampers the control of non-communicable diseases.² Lesotho is a small landlocked country completely surrounded by South Africa. The high burden of human immunodeficiency virus (HIV) and *Mycobacterium tuberculosis* infections consumes a significant proportion of the already strained health budget in Lesotho leaving insufficient resources to tackle NCDs such as hypertension.

Hypertension is an important public health problem with a world prevalence of 26.4% among adults.³ However, most people with hypertension are not aware of their condition. For instance, in Namibia and Kenya, only 3% and 6% of those with hypertension were found to be aware of their condition, respectively.⁴ Hypertension ranks among the top causes of morbidity and mortality among adults in Lesotho.⁵ In addition, the condition is the third most common cause of hospital visits and admissions in the country.⁶ Available data show that the prevalence of hypertension in the country is estimated at 40.7% and 26.8% in the 45–49 and 40–44 age groups, respectively.⁷

Most patients diagnosed with hypertension in Lesotho have uncontrolled condition. According to Thinyane et al,⁶ about 75.6% of the hypertensive patients in Lesotho have uncontrolled hypertension. Clinical practice guidelines for the management of hypertension recommend initial monotherapy regimen with a change in therapy when blood pressure (BP) targets are not met.⁸ However, poor adherence to these guidelines in Lesotho may be contributing to uncontrolled hypertension. Knowledge of the disease and medications have also been implicated as

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a major cause of poor treatment outcomes of chronic NCDs,¹ including hypertension.

Health literacy is an important determinant of treatment outcomes in patients suffering from chronic NCDs⁹ such as hypertension. Adequate basic health literacy influences ability to apply literacy skills to lifestyle modifications and health-related materials such as prescriptions, appointment cards, and medicine labels. Williams et al¹⁰ present low-literacy levels among patients with chronic NCDs as a major barrier in educating them about their disease condition and medication. The same study notes that inadequate health literacy increases the cost of health care through inappropriate use of medicines. Notwithstanding the high-literacy level of 82%,¹¹ Lesotho may have low levels of health literacy. Nutbeam⁹ considers improving health literacy as an important public health goal in developing countries and summarizes the functional health model as shown in Figure 1. The model is particularly important in developing countries such as Lesotho where health literacy levels are generally low.

The most cost-effective intervention against NCDs such as hypertension is health literacy awareness campaigns which promote lifestyle modification.¹² Improved health literacy leads to better self-management competencies in hypertension patients. Deakin et al¹³ emphasize that improving eating habits and exercising are the most critical lifestyle modifications in hypertension patients. Sacco et al² highlight that community health workers can play an important role in promoting health literacy in developing countries.

Very little is known about the level of health literacy among patients on hypertension treatment in Lesotho. Therefore, this study evaluated the levels of knowledge of disease condition and medications among hypertension patients in Lesotho and assessed the significance of these two indicators on treatment outcomes of the condition.

Methods

Study Setting

Lesotho is a small landlocked mountainous country of about 1.8 million people which is completely surrounded

by South Africa.¹⁴ The country is divided into 10 administrative districts with the capital city, Maseru, in Maseru district. Each district has, in addition to clinics, at least one district hospital which serves as a referral center for the diagnosis and treatment of diseases. This study was conducted in all the ten districts of Lesotho. Each hospital or clinic has one specific day in a month for checkup of hypertension patients.

Data Collection

Data were collected between November 2014 and January 2015 on hypertension checkup days for each hospital or clinic. The study included patients who had been on hypertension treatment for at least six months in 9 district hospitals and 19 clinics in the country. The study purposively sampled all the hypertension patients who visited the hospital or clinic on the hypertension appointment day and were willing to participate in the study. For each hospital or clinic, sampling was done once on the hypertension checkup day within the period of data collection. Data were collected from 345 patients who had hypertension.

Using a data collection form, six-month retrospective data including medical history and BP measurements were collected from the medical records. At each hospital or clinic, primary care physicians and nurses were interviewed briefly on the protocol of BP measurement. According to the primary care physicians and nurses, BP values in the medical records were measured by qualified nurses using electronic sphygmomanometers. However, the aneroid sphygmomanometers were used when the electronic machines were not working.

Before taking the measurements, patients were advised to sit quietly in a relaxed position and rest for about 5 minutes with legs uncrossed and the right arm free of clothes. The patient's right arm was then placed on a table with the palm facing upward. The appropriate cuff size was selected and the BP was measured in a sitting position with the arm at the same level with the heart. The artery position mark on the cuff was aligned with the brachial artery and the cuff wrapped securely. The systolic and diastolic BP readings were then recorded. A second reading was taken to confirm

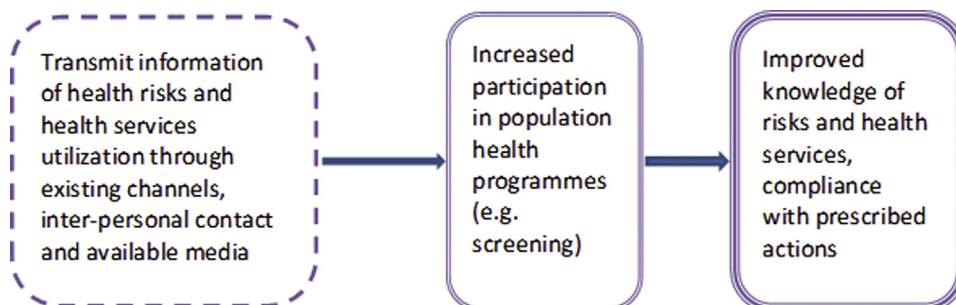


Figure 1. Functional health literacy model. Adapted from Nutbeam.⁹

the first one. A third reading was taken in cases where the first and second readings differed by 10 mm Hg or more, and the average of the closest two was recorded. The sphygmomanometers were validated by ensuring that the needle was at zero mark before taking the measurement.

Data on patient history including knowledge of medicines and their disease conditions were collected using a semi-structured questionnaire designed and developed by the researchers with the aid of contributions from pharmacists and primary health-care physicians (see the Appendix). The questionnaire was pilot-tested among 10 hypertensive patients at one of the district hospitals. Structured interviews were conducted in local language (Sesotho) with the study participants and the researchers filled out the questionnaires.

Definitions

Uncontrolled BP was defined as having BP measurements greater than 140/90 mm Hg on at least two consecutive visits over six months. Patients' knowledge of disease and drugs was assessed qualitatively by the researchers through determining how well specific questions about the disease were answered. Inadequate knowledge was defined as failure to identify 50% or more of preset keywords about the disease and the associated drugs. The preset keywords were derived from the words used to describe hypertension and the associated medications. Defaulting treatment was defined as either failure to collect medicines on the appointed date or skipping doses at least once within the six-month period.

Data Analysis

Data from the completed questionnaires and medical records were captured using Microsoft Access database application and analyzed using Stata version 13 software. The significance of knowledge about the disease and antihypertensive medicines was tested by chi-square test using Stata.

Ethical Considerations and Clearance

Data were collected following standard guidelines of research ethics. The research proposal was submitted and approved by the institutional ethical review board of the Faculty of Health Sciences at the National University of Lesotho and the ethics committee of the Ministry of Health of Lesotho. Permission to conduct the study was also sought from and granted by the relevant hospital authorities. The respondents were provided with information on the background of the study. The respondents were also informed that their participation was voluntary and that they could decline to answer certain questions, including that they could withdraw their participation at any time. In addition, confidentiality of their information was also assured and data were collected in privacy. Subsequently,

each respondent signed a written consent form before participating in the study.

Results

Demographic Characteristics

Two hundred twelve patients had data acceptable for analysis. The ages of the 212 patients with hypertension ranged from 31 to 86 years (median = 63; interquartile range = 54–72). Of the 212 patients, 184 (86.8%) were female. About 57% of the patients indicated that they were unemployed.

One hundred seventy-two (81.1%) patients had hypertension monocondition while 40 had multiple chronic conditions. Of the patients with multiple conditions, 31 (77.5%, $n = 40$) had hypertension and diabetes only, 7 (17.5%) had asthma and hypertension only, whereas 2 (5.0%) patients had all the three conditions.

Of the patients with hypertension, 101 (47.6%, $n = 212$) were taking hydrochlorothiazide alone, whereas 12 (5.7%) and 7 (3.3%) were taking captopril and nifedipine, respectively, as monotherapies. The remaining hypertension patients were taking multiple therapies. Captopril-based regimen were used by 40 (18.7%, $n = 212$), whereas 23 (10.8%) used hydrochlorothiazide-based regimens. In hypertension patients with diabetes, insulin, metformin, and glibenclamide were the main therapies used to treat the diabetes condition.

Treatment Outcomes

Table 1 presents frequencies of the treatment outcomes in hypertension patients over the six months. Overall, 160 (75.5%) patients had uncontrolled BP.

Knowledge of Hypertension Condition

Concerning knowledge of their hypertension disease condition, 36% were found to have inadequate knowledge about the disease. With respect to diet, only 21% knew about the need to maintain a low-salt diet while only 14% knew about the need to reduce the intake of fatty foods. The need to avoid stress, depression, and overexcitement was adequately

Table 1
Six-month treatment outcomes for hypertension

BP category	Frequency	Percentage
<120/90 mm Hg	1	0.5
120/90–140/90 mm Hg	51	24.0
140/90–160/100 mm Hg	85	40.1
160/100–180/120 mm Hg	58	27.4
>180/120 mm Hg	17	8.0
Total	212	100.00

BP, blood pressure.

known by less than 10% of the patients. About 20 (9.4%) patients had inadequate knowledge about the signs and symptoms of hypertension. Less than 10% of the patients knew about the need for physical exercise.

Knowledge of Hypertension Medications and Reasons for Defaulting Treatment

About 44% (n = 212) of the patients had inadequate knowledge about their medicines. One hundred eleven (52.4%, n = 212) patients had defaulted appointment dates at least once during the six months, citing various reasons for their defaulting. By proportion of those who defaulted, being away on the appointment date (35.6%), illness (26.6%), lack of money for transport (15.3%), forgetting (14.0%), work and other commitments (4.5%), having another medical appointment elsewhere (3.2%), and having misplaced the medical record book (0.9%) were the reasons cited for defaulting. About 24% (n = 212) of the patients complained about the practice by hospitals and clinics of giving hypertension medications only on one designated appointment day per month which made it difficult for them to keep the appointments and collect their medications timely.

One hundred thirty-seven (64.6%, n = 212) patients reported having failed to take their medications as prescribed at least once within the six-month period. Twenty-two (16%, n = 137) of these patients conceded to doubling their medication doses after missing the medications. Of those with uncontrolled hypertension, about 31% of the patients reported having stopped taking their medications when they felt better.

The Significance of Knowledge About Hypertension and Associated Medications

Tables 2 and 3 present the significance of knowledge about antihypertensive medicines and the disease, respectively. Inadequate knowledge of antihypertensive medicines was significantly associated ($P = .028$) with having uncontrolled hypertension. However, inadequate knowledge of the disease condition was not significantly associated ($P = .065$) with having uncontrolled hypertension.

Table 2

Does the patient have adequate knowledge of hypertension medicines? (n = 207)

Treatment outcome	Yes (%)	No (%)	Row Totals
Controlled HTN	22 (24.2)	15 (12.9)	37
Uncontrolled HTN	69 (75.8)	101 (87.1)	170
Column totals	91	116	207

HTN, hypertension.

Chi-squared value = 4.39 and $P = .028$; note that the chi-square test did not control for those with multiple conditions.

Table 3

Does the patient have adequate knowledge of hypertension condition? (n = 209)

Treatment outcome	Yes (%)	No (%)	Row Totals
Controlled HTN	19 (24.7)	20 (15.2)	39
Uncontrolled HTN	58 (75.3)	112 (84.8)	170
Column totals	77	132	209

HTN, hypertension.

Chi-squared value = 3.16 and $P = .065$.

Discussion

About 75.5% hypertension patients had uncontrolled hypertension in this study. Notably, about 8% of the patients had BP treatment outcomes greater than 180/120 mm Hg in the six-month period. The patients with such high BP treatment outcomes face a greater risk of organ damage, including stroke, heart failure, or renal failure. The high proportion of uncontrolled hypertension highlights the need for other special programs to address the problem in the country.

Uncontrolled BP is common among patients with hypertension in this population. This implies that hypertension treatment in Lesotho may not be achieving its goals. This could be attributed to patient factors and quality of care, including adherence to hypertension treatment guidelines by health facilities. The results of this study concur with the findings by Thinyane et al⁶ who also reported that about 75.6% of hypertension patients had uncontrolled BP in Lesotho. Another study by Hendriks et al⁴ found that about 82% and 92% of those on hypertension treatment had uncontrolled BP in Namibia and Kenya, respectively. In addition, Dzudie et al¹⁵ in Cameroon found 75.4% of those on hypertension treatment to have uncontrolled hypertension (BP > 140/90 mm Hg).

Notably, 87% of the patients were females. The high proportion of females could be ascribed to more women visiting hospitals compared to men, rather than more women suffering from hypertension in this population. Redondo-Sendino et al¹⁶ note that women report greater morbidity and make greater use of health-care services compared to men. The low proportion of men in this study could also be attributed to the tendency of men from Lesotho to emigrate to South Africa where they work in the mining and agricultural industries. Therefore, there is need for a study to investigate the prevalence and the level of control of hypertension including the level of health literacy among Basotho men working in the South African mining and agricultural industries. In addition, there is need to raise awareness on the importance of regular checkup for hypertension among men living in Lesotho.

A significant proportion of these patients have inadequate knowledge of medications (44%) and their disease conditions (36%). This may be a result of inadequate functional health literacy or poor quality of care by the

clinicians. Rodondi et al¹⁷ note that there is need for therapy modification within six months of a patient failing to improve while on hypertension treatment. However, the proportion of patients whose pharmacotherapy was appropriately modified within the recommended six months could not be established in this study due to lack of data. The average time it takes before the patients with uncontrolled hypertension return to control without therapy modification is also not known in this population.

About 48%, 6%, and 3% of patients with hypertension were taking hydrochlorothiazide, captopril, and nifedipine as monotherapies. The use of monotherapies, particularly hydrochlorothiazide, without modification despite uncontrolled hypertension is not effective in this population. Monotherapies are usually used for longer periods because they are affordable. However, the World Health Organization¹⁸ emphasizes that monotherapy is inadequate for most hypertension patients and that hydrochlorothiazide diuretic, although it is the cheapest option, is not the most cost-effective in populations at high risk of hypertension. Therefore, there is need for reviewing patient medications timely for improved hypertension treatment outcomes in this population.

Inadequate knowledge of antihypertensive medicines was significantly associated ($P = .028$) with having uncontrolled BP. The inadequate knowledge of antihypertensive medicines among patients suffering from hypertension has a negative effect on hypertension treatment outcomes. Although not significantly associated with having uncontrolled hypertension, 36% of hypertension patients had inadequate knowledge of the disease.

About 52% and 65% of the patients in this study had defaulted their appointment dates and failed to take medications as prescribed at least once during the six months, respectively. About 16% of the patients, had at least once, doubled their medication doses after missing the medications. In addition, about 31% of those with uncontrolled hypertension had stopped taking their medications when they felt better. Defaulting appointments and failure to take medications as prescribed is a problem among hypertension patients. Clark¹⁹ reports that about 50% of patients with hypertension default their appointment dates, and 40% do not take their medications as prescribed in the United States of America. The high proportion of defaulting treatment in this study may explain the high proportion of uncontrolled hypertension in this population. One of the major barriers to patient compliance with their medications as reported by 24% of the patients in this study is the practice by hospitals and clinics of giving hypertension medications only on one designated appointment day per month. This practice makes it difficult for patients to obtain their medications timely and increases the chances of defaulting treatment. Therefore, there is need to increase the number of appointment days per month to improve access to hypertension medicines in the country.

According to Williams et al,¹⁰ inadequate functional health literacy poses a major barrier to educating patients with chronic diseases. Gazmararian et al²⁰ report that health literacy level is an important independent predictor of patients' knowledge of their chronic illness. A public health approach to improve functional health literacy is needed in this population to address this problem. Uncontrolled hypertension is a major risk factor for organ damage, including stroke, heart failure, or renal failure.²¹ However, data on target organ damage due to hypertension are scarce in this population. Nevertheless, raising the level of health literacy and improving quality of care in health facilities is required to enable early detection of uncontrolled hypertension and subsequent pharmacotherapy modification. Therefore, transmission of information on health risks of uncontrolled hypertension through information brochures and other media in vernacular language (Sesotho) is urgently needed in this population.

Although restricting dietary sodium is an important lifestyle modification required among hypertension patients, the provision of sufficient dietary potassium is equally important. Data on life-style modifications, including dietary sodium and potassium intake, are lacking in this population. According to Zhang et al,²² reduced dietary salt intake with increased potassium intake can effectively lower BP. There is therefore a need for an investigation to establish the levels of sodium and potassium in the diet of this population.

Of the 345 patients who had hypertension, only about 61% had data acceptable for analysis. This implies that about 39% of the patients did not have adequate records. These gaps highlight a profound limitation in the implementation of the hypertension treatment program by the health facilities. However, the findings from this study, which covered all the 10 districts of Lesotho, add valuable data to the hypertension treatment program and for policy making. These findings can also benefit those affected by hypertension to improve treatment outcomes and manage the condition of hypertension.

Conclusion

About 76% of the patients have uncontrolled BP and more than 50% of the patients default appointment dates and fail to take medications as prescribed in this population. Thirty-six percent and 44% of hypertension patients have inadequate knowledge about the disease and antihypertensive medicines, respectively. Inadequate knowledge of antihypertensive medicines is an important determinant of uncontrolled hypertension. Poor treatment outcomes and inadequate of knowledge of hypertension condition and the associated medications are common in this population. Improving the knowledge of hypertension condition and medications are important interventions required in this population. A study to establish levels of sodium and

potassium in the diet of this population is required. There is need to increase the number of appointment days per month to improve access to hypertension medicines in Lesotho. To improve the monitoring of treatment outcomes of hypertension patients in Lesotho, this study recommends better medical record keeping by health facilities.

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Supplementary Data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.jash.2015.10.009>.

References

- Habib SH, Saha S. Burden of non-communicable disease: global overview. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 2010;4(1):41–7.
- Sacco R, Smith S, Holmes D, Shurin S, Brawley O, Cazap E, et al. Accelerating progress on non-communicable diseases. *Lancet* 2013;382(9895):e4–5.
- Kearney PM, Whelton M, Reynolds K, Whelton PK, He J. Worldwide prevalence of hypertension: a systematic review. *J Hypertens* 2004;22(1):11–9.
- Hendriks ME, Wit F, Roos M, Brewster LM, Akande TM, de Beer IH, et al. Hypertension in sub-Saharan Africa: cross-sectional surveys in four rural and urban communities. *PLoS One* 2012;7(3):e32638.
- GoL. Lesotho. Annual Joint Review Report (2009/2010). Maseru: Government of Lesotho; 2010.
- Thinyane KH, Mothebe T, Sooro M, Namole LD, Cooper V. An observational study of hypertension treatment and patient outcomes in a primary care setting. *Pan Afr Med J* 2015;20:424.
- GoL. Lesotho Demographic and Health Survey 2009. Maseru: Government of Lesotho; 2009.
- Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL Jr, et al. The seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure: the JNC 7 report. *JAMA* 2003;289(19):2560–71.
- Nutbeam D. Health literacy as a public health goal: a challenge for contemporary health education and communication strategies into the 21st century. *Health Promot Int* 2000;15(3):259–67.
- Williams MV, Baker DW, Parker RM, Nurss JR. Relationship of functional health literacy to patients' knowledge of their chronic disease: a study of patients with hypertension and diabetes. *Arch Intern Med* 1998;158(2):166–72.
- Harber C, Brock C. Education in Southern Africa. New York: Bloomsbury Publishing; 2013.
- Beaglehole R, Bonita R, Alleyne G, Horton R, Li L, Lincoln P, et al. UN high-level meeting on non-communicable diseases: addressing four questions. *Lancet* 2011;378(9789):449–55.
- Deakin T, McShane CE, Cade JE, Williams R. Group based training for self-management strategies in people with type 2 diabetes mellitus. *Cochrane Database Syst Rev* 2005;(2):CD003417.
- BOS. Lesotho 2006 census of population and housing preliminary report. Maseru: Government Printers; 2007.
- Dzudie A, Kengne AP, Muna WF, Ba H, Menanga A, Kouam CK, et al. Prevalence, awareness, treatment and control of hypertension in a self-selected sub-Saharan African urban population: a cross-sectional study. *BMJ Open* 2012;2(4):e001217.
- Redondo-Sendino Á, Guallar-Castillón P, Banegas JR, Rodríguez-Artalejo F. Gender differences in the utilization of health-care services among the older adult population of Spain. *BMC Public Health* 2006;6(1):155.
- Rodondi N, Peng T, Karter AJ, Bauer DC, Vittinghoff E, Tang S, et al. Therapy modifications in response to poorly controlled hypertension, dyslipidemia, and diabetes mellitus. *Ann Intern Med* 2006;144(7):475–84.
- World Health Organization ISoHWG. 2003 World Health Organization (WHO)/International Society of Hypertension (ISH) statement on management of hypertension. *J Hypertens* 2003;21(11):1983–92.
- Clark LT. Improving compliance and increasing control of hypertension: needs of special hypertensive populations. *Am J Heart J* 1991;121(2):664–9.
- Gazmararian JA, Williams MV, Peel J, Baker DW. Health literacy and knowledge of chronic disease. *Patient Educ Counsel* 2003;51(3):267–75.
- Hackam DG, Quinn RR, Ravani P, Rabi DM, Dasgupta K, Daskalopoulou SS, et al. The 2013 Canadian Hypertension Education Program recommendations for blood pressure measurement, diagnosis, assessment of risk, prevention, and treatment of hypertension. *Can J Cardiol* 2013;29(5):528–42.
- Zhang Z, Cogswell ME, Gillespie C, Fang J, Loustalot F, Dai S, et al. Association between usual sodium and potassium intake and blood pressure and hypertension among US adults: NHANES 2005–2010. *PLoS One* 2013;8(10):e75289.