Hypertension-related knowledge, attitude, and lifestyle practices of hypertensive patients at three peripheral health care centres in Windhoek, Namibia

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Background. Hypertension is emerging as a significant health issue in developing countries undergoing an epidemiological transition from communicable to non-communicable chronic diseases.
Objective. To assess the knowledge, attitude, and practices (KAP) of hypertensive patients in Windhoek, Namibia.
Methods. This cross-sectional study included 82 hypertensive patients recruited from three peripheral healthcare centres in Windhoek. The data was analysed using the χ^2 test.
Results. The age of the study population ranged from 27 - 70 years (mean 48.32 (SD 11.19)). Most (54%) participants understood the meaning of hypertension, while 74% accurately interpreted their blood pressure levels. Half of the participants identified psychological stress as a risk factor for hypertension, while a larger proportion (67%) could mention at least one complication of uncontrollable high blood pressure. Participants showed a positive attitude towards managing hypertension, with 88% adhering to their medication and 77.2% making at least one lifestyle modification since their diagnosis. A substantial number of patients did not adhere to the recommended diet (71%, $p<0.001$) and 66% did not exercise ($p=0.004$). Conversely, 84% were not smokers ($p<0.001$). Additionally, knowledge of the effect of alcohol on hypertension was associated with alcohol consumption (χ^2 8.906, $p=0.003$), with only 34% (22/64) of patients with better knowledge of alcohol's effects consuming alcohol, while this proportion was 74% among those with poor knowledge.
Conclusion. While most patients possess good hypertension-related knowledge, they lack the necessary attitudes and practices for effective management. Therefore, targeted campaigns promoting lifestyle changes are essential to alter patient behaviour and enhance hypertension management.

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Student author biography
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Globally, raised blood pressure is estimated to cause 7.5 million deaths, accounting for 12.7% of total deaths and 3.7% of disability-adjusted life years (DALYs).[1] Hypertension prevalence in Sub-Saharan Africa is increasing rapidly because of longevity, unhealthy diet, obesity and physical inactivity.[2] Namibia is no exception, as hypertension accounted for 2.03% of the country's total deaths in 2011.[3] In 2013, Namibia's age-standardised hypertension prevalence among adults aged 35 - 64 years was 46%.[4] In 2016, hypertension ranked as the ninth leading cause of death among Namibian adults aged 60 years and older, claiming 154 lives (2.2%).[5] Studies indicate that hypertension is increasingly contributing to morbidity and mortality, emerging as a growing public health concern requiring urgent attention.[6,7] Hypertension disrupts the normal physiology of the body's organs, possibly leading to renal failure, coronary heart disease, cerebrovascular disease, peripheral vascular disease and blindness.[3,8] Despite the alarming upward trend in prevalence, there remains inadequate awareness and control of hypertension.[6] In Namibia, a major challenge in improving the management, control and treatment outcomes of hypertension may stem from a poor understanding of patients' behavioural patterns and cultural beliefs, coupled with a lack of acknowledgement of their understanding of the disease. Assessing the awareness levels among patients and the public is the first step in developing preventative and awareness programmes for the disease.[7] Evaluating the knowledge, perception, attitudes and lifestyle practices of hypertensive patients is important for population-level control of the condition, ensuring quality healthcare delivery.[6] No studies have been conducted on hypertensive patients' knowledge, perceptions, attitudes and lifestyle practices in Windhoek. As such, the study objectives were to determine the knowledge of hypertension among hypertensive patients

and assess their attitudes and lifestyle practices related to managing the condition.

Methods

This cross-sectional study included hypertensive patients in Windhoek, Namibia. The study participants were recruited from the Khomasdal Health Center, Robert Mugabe Clinic and Katutura Health Center, which are peripheral clinics with catchment populations of 34 276 (732 average monthly hypertensive patients), 75 747 (921 average monthly hypertensive patients) and 102 830 (1 462 average monthly hypertensive patients), respectively. The study targeted hypertensive patients aged 18 years and older, with a history of hypertension lasting at least 12 months. Patients younger than 18 years and those with senile dementia were excluded.

The study sample size was established using the Cochran formula with a 10% margin of error and 95% confidence interval (CI). The Khomas region hypertension prevalence, where Windhoek is situated, was reported to be 56.9% in 2013.[9] Therefore, the following formula was used to determine the appropriate sample size.

$n = (Z\alpha/2)2\ p(1-p)\ /\Delta 2$

Whereby, n = sample size, Zα/2 = confidence level of 95% (standard deviation 1.96), p is the expected proportion with hypertension in the Khomas region, and Δ= accuracy level (10%).

$$n = \frac{(1.962)\ (0.56.9)\ (1-0.56.9)}{0.12}$$

$$= 94$$

The study's targeted sample size was 104, which included an addition of 10% to counteract possible dropout. The systematic random sampling method was used. Only 103 participants could be recruited for the study, with 82 completing the interview. A larger number of study participants were sampled from the clinic with the highest patient pool, with 31, 27 and 24 participants selected from Katutura, Robert Mugabe and Khomasdal clinics, respectively.

The study employed a structured questionnaire comprising both open and closed-ended questions in English. The questionnaire was adapted from a template used in a study by Iyalomhe *et al.*[6] The questionnaire contained questions about the participants' demographic characteristics as well as their knowledge, attitudes and lifestyle practices related to hypertension. Data were collected through face-to-face interviews. Where necessary, the questionnaire was translated into the participant's ethnic language.

SPSS version 22 (IBM Corp, USA) was used for analysis. Descriptive data are presented as frequencies. The χ^2 test was performed for categorical variables. Significance was set at $p<0.05$.

Results

In total, 82 participants (61% female) were included in the study (Table 1). The mean age of the participants was 48 (11.2) years and ranged from 27 - 70 years. A higher proportion (63%, 52/82) of the participants had a secondary school level education, while 26% (21/82) and 11% (9/82) had primary school and tertiary education levels, respectively (Table 1). In addition, most participants were employed (39%, 32/82), had hypertension for more than 5 years (54%, 44/82) and had no other health condition (67%, 55/82).

Patients' knowledge and perceptions were correct regarding some aspects of hypertension. Table s 2 and 3 show patients' responses across different variables compared with their expected responses analysed using the χ^2 test.

Most patients accurately defined hypertension (54%, 44/82) and mentioned headache as a symptom of hypertension (44%, 36/82) (Table 2). However, no significant differences were noted between patients' response frequencies ($p>0.05$) (Table 2). Patients' responses differed significantly regarding several domains, including the correct interpretation of hypertension, awareness of hypertension causes, recognition of hypertension as a serious medical condition, identification of hypertension complications, perception of hypertension as a curable condition and understanding of hypertension medication (all $p<0.01$). The results significantly showed that most participants could correctly interpret blood pressure results (74%) and were aware that stress (50%) and heredity (27%) are contributing factors to hypertension. Furthermore, a majority (90%) of participants recognised hypertension as a serious medical condition and were knowledgeable about its associated complications (67%). Conversely, a large proportion of participants acknowledged that hypertension is not curable (77%).

We also found significant differences in some patients' attitudes and lifestyle practices. Significant differences in frequency were observed for various factors, including salt consumption, reasons for missing follow-up, fast food consumption, fruit and vegetable consumption, adherence to prescribed diet, smoking habits and skipping medication for a month (all $p<0.001$) (Table 3). Most participants did not specify a reason for missing follow-up appointments (49%), did not monitor their salt intake (54%), consumed fast food (84%), reported occasional consumption of fruits and vegetables (60%) and did not exercise regularly (66%). In addition, many of the participants did not adhere to the prescribed diet (71%). Also, most were not smokers (84%) and did not skip their medication for a month (88%). However, there were no significant differences for missing follow-up appointments ($p=0.224$), maintaining the right weight ($p=0.061$) and the consumption of alcohol ($p=0.185$).

Table 1. Sociodemographic characteristics of study participants (*N*=82)

Characteristic	Frequency, *n* (%)
Sex	
Male	32 (39%)
Female	50 (61%)
Age (years), mean (SD)	48.3 (11.2)
Education level	
Primary School	
Primary School	21 (26%)
Secondary School	52 (63%)
Bachelor's degree	9 (11%)
Occupation type	
Unemployed	14 (17%)
Pensioner	13 (16%)
Self-employed	23 (28%)
Employed	32 (39%)

SD = standard deviation.

Patients' knowledge of factors influencing hypertension did not affect most of their lifestyle practices (Table 4). No significant differences were found between participants with good v. poor knowledge about hypertension regarding medication adherence, smoking habits or exercise frequency (p>0.05). However, alcohol consumption and awareness of the detrimental effects of alcohol on hypertension were significantly correlated (p=0.003). Thus, alcohol intake seems to be influenced by the level of knowledge regarding alcohol's effect on hypertension. Among the 63 participants with better knowledge of alcohol's impact on hypertension, only 34% (n=22) consumed alcohol.

Discussion

Evaluating hypertensive patients' knowledge, perceptions, attitudes and lifestyle practices is important in hypertension management.[6] Our study population predominantly consisted of female participants (61%). The distribution appears to deviate from the hypertension prevalence figures reported for the Khomas region, where the hypertension prevalence stands at 57.3% and 56.7% for women and men, respectively.[9]

Study participants generally demonstrated a high level of knowledge, with a majority correctly interpreting their blood pressure (74%), identifying stress as a contributing factor (50%) and recognising hypertension as incurable (77%). The level of knowledge in our study participants could be considered higher than that of hypertensive patients in Auchi, Nigeria, where only 61% of the participants knew the meaning of hypertension.[6] Contrary to our findings, 70% of the Nigerian study population believed that hypertension is curable, while only 23% of our study population had that perception. Similar to our finding, a study conducted in Iran reported that most participants (87.3%) deemed stress as a cause factor for hypertension.[11] The better level of knowledge among our study participants is not surprising as most have at least a secondary education level (63%), while only 32% of the participants in the Nigerian study had at least a secondary education level. However, it is interesting that a smaller proportion of our study population had only attained primary education (26%), which is established as a risk factor for hypertension in the Khomas region.[6]

Furthermore, our findings showed that most of the study participants perceived hypertension as a serious disease (90%) and were aware of its associated complications (67%), which can lead to severe morbidity and mortality. This is in agreement with the result of another study where 90.7% of the respondents regarded hypertension as a serious disease.[6]

A majority of hypertensive patients in this study exhibited an understanding of the importance of exercise as a lifestyle practice required for hypertension control. The participants adhered to medication (88%), did not smoke (84%) and did not consume alcohol (57%). Despite the majority of the study participants not smoking or consuming alcohol, the proportions of those who smoke and drink alcohol is higher than that recorded for the entire Namibian population, 43% v. 28% (alcohol) and 16% v. 12% (smoking).[11,5] The study in Auchi, Nigeria, also showed that most participants did not consume alcohol.[6] Our finding showed a high medication adherence, which contrasts with a study by Busari *et al.*,[12] where only 33.2% of participants showed good compliance to treatment. We also found that most participants (92%) occasionally or consistently included fruits and vegetables in their diet, which is a beneficial lifestyle practice. Overall, Namibians have a low consumption rate of fruits and vegetables, averaging one serving per day, 1 - 2 times a week. [9,8] Likewise, the study conducted in Auchi, Nigeria established lower consumption of fruits and vegetables among patients (21.3%).[6]

Table 2: Hypertension-related knowledge and perceptions (N=82)

Variable	Frequency, n (%)	χ^2 (d.f.)	p-value
Defined hypertension	44 (54)	0.439 (1)	0.508
Interpreted hypertension correctly	61 (74)	19.512 (1)	0.000***
Indicated hypertension causes as,			
Hereditary	22 (27)	33.610 (3)	0.000***
Stress/worry	41 (50)		
Overweight	6 (7)		
Other	3 (16)		
Consider hypertension a serious disease	74 (90)	53.122 (1)	0.000***
Consider hypertension complications as			
Stroke, death	55 (67)	9.561 (1)	0.002**
Do not know	27 (33)		
Stated hypertension symptoms as			
Headache	36 (44)	5.951 (2)	0.051
No symptoms mostly	18 (22)		
Other	28 (34)		
Indicated hypertension to be curable	19 (23)	23.610 (1)	0.000***
Know their medication	19 (23)	22.827 (1)	0.000***

**p<0.01
***p<0.001
d.f. = degrees of freedom.

Table 3: Attitudes and lifestyle practices of study subject (*N*=82, 100%)

Variable	Frequency, *n* (%)	X^2 (d.f.)	*p*-value
Missing follow-up	35 (43)	35 (1)	0.224
Reason for missing follow-up			
No reason	40 (49)	31.854 (3)	0.000***
Busy at work	22 (27)		
Forgot the date	15 (18)		
No transport money	5 (6)		
Keeping the right weight is required			
Do not know	37 (45)	5.585 (2)	0.061
Agree	25 (30)		
Disagree	20 (25)		
Level of salt consumption			
No salt	8 (10)	70.805 (4)	0.000
Do not measure	44 (54)		
Half a teaspoon	8 (10)		
A pinch	21 (25)		
A tablespoon	1 (1)		
Consuming fast food	69 (84)	38.244 (2)	0.000***
Consuming fruits and vegetables	26(32)	32.366 (2)	0.000***
Sometimes	49 (60)		
No	7 (8)		
Following the diet from a doctor	24 (29)	14.098 (1)	0.000***
Smoking	13 (16)	38.244 (1)	0.000***
Exercise regularly	28 (34)	8.244 (1)	0.004**
Skipping medication for a month	10 (12)	46.878 (1)	0.000***

**p<0.01
***p<0.001
d.f.= degrees of freedom

Table 4: Associations of knowledge and practice variables (*N*=82)

	Respondents' knowledge (%)		
Variable	Poor	Good	Fishers exact/ χ^2 (d.f.)†
Medication knowledge	62	19	F=0.570
Smoking is bad for hypertension	18	64	F=0.495
Exercise is helpful	3	79	F=0.548
Alcohol is bad for hypertension	19	63	χ^2 =8.906 (10.003)*

*p<0.05
d.f. = degrees of freedom.
†Results of the Fisher's exact test or χ2 test are shown

Despite most of our study participants exhibiting beneficial lifestyle practices, adherence to doctor-recommended diets and regular exercise regimens has been lacking. A large number of participants still consumed fast food (84%). The high risk of elevated blood pressure in Windhoek could be due to these practices that may not be suitable for preventing and controlling of high blood pressure. In 2017, hypertension cases in the Khomas region were reported to be associated with obesity rather than the quantity of fruits, vegetables or fast food consumed.[8] Thus, it is evident that lifestyle practices which mostly result in obesity could be the main risk factors that should be addressed to control hypertension in the Khomas region. In addition, it was noted that most (66%) of the participants were physically inactive, a factor that could impede the control and management of hypertension. Low levels of regular exercise can be attributed to a general culture of poor physical activity in the Namibian population, where 73.0% are physically inactive.[9] A higher proportion of hypertensive patients in Nigeria were also reported to be physically inactive (90.7%), which is a cause for concern.[6]

Salt intake reduction practice was the most common lifestyle modification made by the study participants (47.8%). More than half of the participants

have been hypertensive for at least 5 years (55.4%), suggesting that they may have implemented necessary lifestyle modifications to manage the condition effectively. We found that a large proportion of participants (77.2%) have made at least one lifestyle change since being diagnosed, indicating a positive attitude towards managing hypertension.

In exploring the relationship between the participants' level of knowledge and their lifestyle practices, this study established a significant relationship between knowledge of the effects of alcohol consumption and alcohol consumption. Most of the participants who were aware of the harmful effects of alcohol use on hypertension did not consume alcohol, which was the only lifestyle practice impacted by knowledge. To our knowledge, no other study evaluated this relationship.

Participants with good knowledge of hypertension tended to exhibit better lifestyle practices compared with those with poor knowledge. However, possessing good knowledge does not always translate to good practices, as evidenced by our study findings. Although participants had good knowledge, they did not practice beneficial lifestyle practices. A study in Iran reported that despite having good knowledge, some respondents had poor practices, especially regarding food safety.[10] While Iranian patients showed good practices in reducing salt and high-fat diet consumption, aligning with the findings of this study, their practice of increasing physical activity levels was poor.[10]

Study limitations

Our study had a few limitations. First, we had resource constraints impeding our ability to include more data collectors and extend the study duration, thereby limiting the sample size. Thus, not all health facilities in Windhoek were included, which may limit the generalisability of the study. Second, the study excluded patients who receive treatment and follow-up care from the private health sector, who may or may not have better knowledge, attitudes, and lifestyle practices towards hypertension. Finally, interviewer bias could have been introduced in the study as in-person interviews were conducted to collect data. However, measures were taken to reduce bias as much as possible, though the researchers acknowledge that it can never be entirely accounted for.

Conclusion

Most participants in this study had good knowledge and perceptions of hypertension. However, good knowledge does not always translate to adopting beneficial lifestyle practices. The major concerns are that most of the participants did not measure their salt intake and consumed fast foods. Knowledge of the effects of alcohol on hypertension was associated with lower alcohol consumption. Therefore, there is a need to reinforce this baseline knowledge within the awareness campaigns. Individual counselling of patients on lifestyle modifications is imperative at each encounter with the patients.

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Author contributions. MS and EN conceived the idea, designed the study and coordinated the implementation. MS, HZ and EN analysed and interpreted the data. MS, HZ and EN wrote the initial draft of the manuscript. EN supervised the study. All authors contributed to obtaining and assembling the data, during the review process, data interpretation, critical review of the manuscript, and approved the final version of the manuscript.

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Appendix A: Questionnaire

Respondent ID no:
Health Care centre:

Q Are you…?

Male ☐
Female ☐

Q How old are you?

20-24 ☐
25-34 ☐
35-44 ☐
45-54 ☐
55-64 ☐
65+ ☐

Q3. Highest level of education obtained

Primary School ☐
Secondary School ☐
Bachelor's degree ☐
Post graduate degree ☐

Q4: Employment status
- Employed ☐
- Unemployed ☐
- Self-employed ☐
- Pensioner ☐

Q5. What is Hypertension?
- High blood pressure ☐
- Worrying too much ☐
- Obesity or being overweight ☐
- Others? ☐
- Specify ☐

Q6. What is your BP today

Is it: High ☐ Low ☐ Normal ☐

Q7. Who told you that you have hypertension?
- Doctor ☐
- Nurse ☐
- Traditional Healer ☐

Q8. How long have you had Hypertension?
- 1 to 2 years ☐
- 2 to 3 years ☐
- 3 to 4 years ☐
- 4 to 5 years ☐
- More than 5 years ☐

Q9. What do you think causes Hypertension?
- It runs in the family ☐
- Witchcraft/bad luck ☐
- Being obese/Overweight ☐
- Stress/worrying too much ☐
- Drinking Alcohol ☐
- Smoking snuff or cigarettes ☐
- Eating Unhealthy food ☐
- Don't know ☐
- Others? ☐

.....

.....

Q10. Do you have any other health problems?
- Heart problems ☐
- Kidney problems ☐
- Diabetes (Sugar disease) ☐
- None ☐
- Specify ☐
- Others ☐

Q11. Is hypertension a very serious disease?
- No, it is not serious at all…… ☐
- No, it is not very serious ☐
- I don't know ☐
- Yes, it is somehow serious ☐
- Yes, it is very serious ☐

Q12. Can Hypertension be cured once and for all?
- Yes ☐
- No ☐

Q13. What symptoms of hypertension do you know?
- Most of the times no symptoms ☐
- Headaches ☐
- Swollen feet ☐
- Don't know ☐

Q14. Are you taking any medication for your hypertension?
- Yes ☐
- No ☐

Q15. Do you know any of the medications you are taking?

If Yes,
- Specify ☐
- No ☐

Q16. What problems will you have if your BP is not controlled?

.....

.....

.....
- Don't know ☐

Q17. Have you missed a follow update for your checkup and medication?
- Yes, I've missed quite many ☐
- Yes, I sometimes miss my dates ☐
- I rarely miss my follow-up dates ☐
- I never miss my follow-up dates ☐

If you have missed a follow update, what is usually the reason?
- No transport money to the clinic ☐
- Forgot about the date ☐
- Busy with work ☐
- Other ☐

Q18. Have you ever stopped taking your Medication for more than 1 month?
- Yes ☐
- No ☐

Q20. Have you ever been hospitalised for hypertension before
- Yes ☐
- No ☐

Q21. Do you think you need to lose weight to better control your hypertension?
- Strongly Agree ☐
- Agree ☐
- Don't know ☐
- Disagree ☐
- Strongly disagree ☐

Q22. Do you drink alcohol?

Yes ☐
No ☐

Q23. What type of alcohol do you take?
Wine ☐
Beer ☐
Spirits ☐
Traditional brews e.g. Tombo ☐

Q24. Do you think alcohol can worsen your BP
Strongly Agree ☐
Agree ☐
Don't know ☐
Disagree ☐
Strongly disagree ☐

Q25. Do you smoke snuff or cigarettes?
Yes ☐
No ☐

Q26. Can smoking worsen your BP?
Strongly Agree ☐
Agree ☐
Don't know ☐
Disagree ☐
Strongly disagree ☐

Q27. How much salt do you use when preparing meals?
A tablespoon ☐
Half a teaspoon ☐
A pinch ☐
No salt in my food at all ☐
I don't measure at all ☐

Q28. Do you often eat processed foods or fast food from restaurants or vending stalls (KFC, Nandos or kapana)?
Yes ☐
No ☐

Q29. Do you eat a lot of fruits and vegetables?
Yes ☐
Sometimes ☐
No ☐

Q30. What Dietary/food advice have you been given to control your BP
Avoid salty food ☐
Avoid oily food ☐
Eat a lot of fruits and vegetables ☐
Avoid fast food and processed foods ☐
Not advised ☐

Q31.Do you follow the dietary advice you got from the Doctor or Nurse?
Yes, always ☐
Sometimes ☐
No ☐

Q32. Do you exercise regularly?
Yes ☐
Specify how ☐
.....
.....
No, I don't exercise ☐

Q33. What do you think about exercise?
It is very important and it will help improve my condition ☐
A little exercise is good for my health ☐
Exercise has no effect on my health ☐
Exercise is a waste of time ☐

Q34. What have you changed about your life in order to control your BP (You can tick more than one)
I eat healthier food ☐
I exercise regularly ☐
I stopped drinking alcohol ☐
I stopped smoking ☐
I lost weight ☐
I avoid too much salt and oil in my food ☐

Q35. What more can you do to better your health, (You can tick more than one)
Lose weight ☐
Eat healthier food ☐
Stop smoking or Drinking alcohol ☐
Stop Stressing & worrying too much ☐
Avoid salt & salty additives in my food ☐
Exercise more ☐
Always come for my follow ups ☐