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Quality of Counseling About Lifestyle Modifications and Complications of Hypertensive Patients, Sudan

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ABSTRACT

Hypertension is a common chronic disease and an important public health problem. Effective hypertension control depends on patients being aware of the necessary lifestyle modifications. This study aimed to assess the quality of counseling received by hypertensive patients, the influence of blood pressure control and complications of hypertension. This cross-sectional study was conducted on hypertensive patients attending a private medical facility, a governmental facility and a PHC (Primary Health Care) center in Sudan. The patients were randomly selected, and their waist circumference, height and weight were recorded. The participants received counseling from family physicians and SHOs (Senior House Officers) about diet, mental relaxation, weight loss, exercise, smoking, and alcohol. The follow-up doctor vs. counseling showed a significant difference in counseling about diet, salt, fat intake, and smoking. The quality of counseling depended on the doctor rather than the follow-up location. The quality of counseling offered to hypertensive patients depends on the doctor rather than the location; almost half of the participants had to follow up with SHOs, including half of the participants with complications, and only a quarter received counseling about complications. For hypertensive patients, the quality of counseling depends on the doctor rather than the location. Recommendations include prioritizing lifestyle modifications and ensuring doctors are sensitive and aware of their counseling tactics with patients.

INTRODUCTION

Hypertension is a global health challenge common in semi-urban, urban and rural areas and should be monitored and treated vigilantly across the lifespan (Lemogoum et al., 2018). It is caused by cardiovascular diseases associated with other serious miscellaneous illnesses and a high fatality rate.(Petrie et al., 2018) The rapid rate of obesity and old age are the two major factors contributing to its common occurrence in the community (Mosha et al., 2017).

The rationale for this study stems from the fact that the prevalence of hypertension in the general population is 30%-45%, increasing with age. (Kjeldsen, 2018) Hypertension is expected to rise by 60% by 2025 to 1.56 billion adults (Akoko et al., 2017). Lifestyle changes may be an effective way of preventing/delaying hypertension or evading pharmaceutical treatment in patients with grade 1 hypertension and reducing BP in patients who are already treated (Bogale et al., 2020; Ferdinand et al., 2020).

Thus, this study aims to investigate whether effective hypertension solutions are impacted by the quality of the doctor and the counseling received.

MATERIALS AND METHODS

Selection and Description of Participants

Our study was a repeated cross-sectional hospital/PHC center-based study. The Cochran formula collected the sample size for 384 out-patients attending Alzaytouna Specialized Hospital, Alakadimiy Charity Hospital and Omer Ibn Elkhatab PHC center. Of those 384, 250 participants remained after excluding questionnaires with missing essential data such as weight and waist circumference, and the remaining participants were interviewed via questionnaire. Weight, height and waist circumference were recorded via weight scale and tape.

Sample Size

After the patient's voluntary informed consent was obtained in written form, 102 patients were interviewed at a governmental medical facility, 97 were interviewed at a private medical facility, and the remaining 51 were interviewed at a PHC center; the males were 139 (55.6%), and the females were 111 (44.4%), their ages ranged between 23-89 years. Participants who were married were 82%, 13.6% were uneducated, the remaining participants received some education, and 57.6% were employed. We divided the population into three groups; the first group was properly diagnosed patients by a physician, the second group was patients on hypertensive drugs, and the third group had patients who suffered from hypertension for at least 1 year. The study was carried out between January and September 2017.

Statistics

At the beginning of this study, the researchers adhered to the STROBE guidelines. Statistical software packages (Excel and Access, Microsoft, Redmond, WA; SPSS 25.0,

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SPSS Inc. Chicago, IL) were used for data management and analysis, respectively. The chi-square or Fisher exact test was used for comparisons of proportions in two groups. Groups were assumed to statistically differ significantly when the probability level was less than 0.05, i.e. p < 0.05.

RESULTS

The most frequent age group was 60-69 years at 30.8%, followed closely by the age group 50-59 years at 29.6%, and the mean ± standard deviation was 58.77± 6.80 years. Table 1 shows the demographic data of the 250 participants: the frequency and the percentage value of the age groups, marital status, educational level and employment status of the participants.

Table 2 demonstrates the demographic data, and its association with blood pressure control adjusted OR (Odds Ratio) and 95% CI (Confidence interval) showed a statistically significant difference (p=0.005). Controlled blood pressure was most common in the age group of 50- 59 years (34.6%), followed closely by 60-69 years (29.8%), and uncontrolled blood pressure was most frequent in the age group 60-69 years (33.9%). In contrast, the remaining demographic data did not show any significant association with blood pressure control: sex vs blood pressure control (p=0.338), marital status vs. blood pressure control (p=0.238), educational level vs. blood pressure control (p=0.368), employment vs. blood pressure control (p=0.548).

Table 3 shows the demographic data vs. complications presence, age groups vs. complications presence demonstrated a statistically significant difference with an adjusted OR and 95% CI (p=0.043); the presence of complications was most frequent in the age group of 60-69 years (29%), and none existed in the age group of 20-29 years, the sex vs. complication presence adjusted OR and 95% CI showed a statistically significant difference (p=0.030), as 66.7% males and 33.3% females show complications presence. The remaining demographic characteristics vs. complications presence analysis were statistically insignificant: marital status vs. complications presence (p=0.405), educational level vs. complications presence (p=0.432), and employment vs. complications presence (p=0.436).

The follow-up doctor vs. counseling offered can be seen in Table 4. The counseling offered about diet and the salt intake adjusted OR and 95% CI showed a statistically significant difference, (p=0.002) and (p=0.019), respectively. All participants following up with a family physician received counseling about diet as well as salt intake. The percentage of participants following up with a physician and registrar who received counseling about diet as well as salt intake was 96.7% and 92.3%, respectively, while 82.4% of participants following up with an SHO received counseling about diet whereas 86.6% received counseling about salt intake. The follow-up doctor vs. counseling offered about fat intake adjusted OR and 95% CI showed a statistically significant difference (p=0.013); 96.4% of participants following up with a family physician received counseling about fat intake while 96.7% of the participants following up with a physician received the counseling. Participants following up with the registrar and receiving counseling about fat intake were 92.3%, while the percentage of participants following up with an SHO who received the counseling was 84%.

The follow-up doctor vs. counseling offered about mental relaxation adjusted OR and 95% CI showed a statistically significant difference (p=0.001), all the participants following up with a family physician or a registrar received counseling about mental relaxation, whereas 77.8% and 95% of the participants following up with a physician and an SHO respectively, received the counseling. The follow-up doctor vs. smoking counseling (passive, active and cessation) adjusted OR and 95% CI showed a statistically significant difference (p=0.012), 75.6% of all the participants received counseling about smoking. A total of 67.9% of participants following up with a family physician and 65.6% of participants following up with a physician received counseling about smoking. Nearly 84.6% of participants following up with a registrar received the counseling while the percentage that received counseling from an SHO was 84%.

The follow-up doctor vs. counseling offered about alcohol consumption adjusted OR and 95% CI showed a statistically significant difference (p=0.001); 3.6% of all the participants received counseling about alcohol consumption, 50% of the participants followed up with a family physician, 46.7% of the participants following up with a physician, 76.9% following up with a registrar while 78.2% of participants following up with an SHO received counseling about alcohol consumption. The remaining follow-up doctor vs. counseling offered analysis was statistically insignificant with (p>0.5) fruit intake (p=0.424), vegetable intake (p=0.787), weight loss (p=0.473), and exercise (p=0.230).

Table 5 shows the follow-up location vs. counseling offered about hypertension (p=0.872). Approximately 45.5% of the participants who received counseling about hypertension were followed up at a private medical facility, 33.7% at a PHC center and 20.8% at a governmental facility.

Table 1: Demographic Data

Sex	Frequency	Percentage
Males	139	55.6
Females	111	44.4
Age Group	**Frequency**	**Percentage**
20-29 years	3	1.2

30-39 years	9	3.6
40-49 years	40	16.0
50-59 years	74	29.6
60-69 years	77	30.8
70-79 years	36	14.4
80-89 years	11	4.4
Marital status	**Frequency**	**Percentage**
Single	6	2.4
Married	205	82.0
Divorced	9	3.6
Widowed	30	12.0
Educational level	**Frequency**	**Percentage**
Uneducated	34	13.6
Quran School (Khalwa)	10	4.0
Primary school	36	14.4
Secondary school	74	29.6
University	88	35.2
Postgraduate studies	8	3.2
Employment	**Frequency**	**Percentage**
Employed	144	57.6
Unemployed	106	42.4

Table 2: The demographic data vs. blood pressure control

	Variable	**Frequency**	**Controlled Blood Pressure**
Sex			
Male	139 (55.6%)	103 (53.9%)	36 (61.0%)
Female	111 (44.4%)	88 (46.1%)	23 (39.0%)
Age			
20-29	3 (1.2%)	2 (1.0%)	1 (1.7%)
30-39	9 (3.6%)	4 (2.1%)	5 (8.5%)
40-49	40 (16%)	33 (17.3%)	7 (11.9%)
50-59	74 (29.6%)	66 (34.6%)	8 (13.6%)
60-69	77 (30.8%)	57 (29.8%)	20 (33.9%)
70-79	36 (14.4%)	22 (11.5%)	14 (23.7%)
80-89	11 (4.4%)	7 (3.7%)	4 (6.8%)
Marital Status			
Single	6 (2.4%)	6 (3.1)	0
Married	205 (82.0%)	158 (82.7%)	47 (79.7%)
Divorced	9 (3.6%)	5 (2.6%)	4 (6.8%)
Widowed	30 (12.0%)	22 (11.5%)	8 (13.6%)
Educational Level			
Uneducated	34 (13.6%)	24 (12.6%)	10 (16.9%)
Quran School (Khalwa)	10 (4.0%)	6 (6.3%)	4 (6.8%)
Primary school	36 (14.4%)	30 (15.7%)	6 (10.2%)
Secondary school	74 (29.6%)	55 (28.8%)	19 (10.2%)
University	88 (35.2%)	69 (36.1)	19 (32.2)
Postgraduate Studies	8 (3.2%)	7 (3.7%)	1 (10.7%)

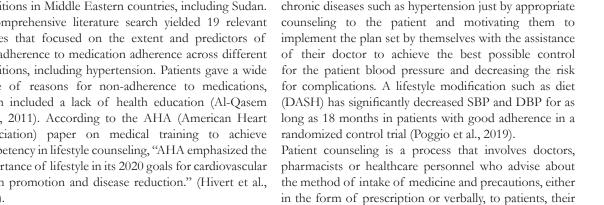| Employment			
Employed	144 (57.6%)	113 (59.2%)	31 (52.5%)
Unemployed	106 (42.4%	78 (40.8%)	28 (47.5%)

Table 3: The demographic data and Complications presence

Variable	Frequency		Complications Presence
		Yes	No
Sex			
Males	139	46	93
	(55.6%)	(66.7%)	(51.4%)
Females	111	23	88
	(44.4%)	(33.3%)	(48.6%)
Age Groups			
20-29 years	3	0	3
	(1.2%)	(0.0%)	(1.7%)
30-39 years	9	3	6
	(3.6%)	(4.3%)	(3.3%)
40-49 years	40	10	30
	(16.0%)	(14.5%)	(16.6%)
50-59 years	74	14	60
	(29.6%)	(20.3%)	(33.1%)
60-69 years	77	20	57
	(30.8%)	(29.0%)	(31.5%)
70-79 years	36	17	19
	(14.4%)	(24.6%)	(10.5%)
80-89 years	11	5	6
	(4.4%)	(7.2%)	(3.3%)
Marital Status			
Single	6	0	6
	(2.4 %)	(0.0%)	(3.3%)
Married	205	57	148
	(82.0%)	(82.6%)	(81.8%)
Divorced	9	2	7
	(3.6%)	(2.9%)	(3.9%)
Widowed	30	10	20
	(12.0%)	(14.5%)	(11.0%)
Education Level			
Uneducated	34	9	25
	(13.6%)	(13.0%)	(13.8%)
Quran School (Khalwa)	10	4	6
	(4.0%)	(5.8%)	(3.3%)
Primary school	36	10	26
	(14.4%)	(14.5%)	(14.4%)
Secondary school	74	23	51 (28.2%)
	(29.6%)	(33.3%)	
University	88	19	69
	(35.2%)	(27.5%)	(38.1%)
Postgraduate studies	8	4	4

Primary school	(3.2%)	(5.8%)	(2.2%)
Employment Status			
Employed	144	37	107
	(57.6%)	(53.6%)	(59.1)
Unemployed	106	32	74
	(42.4%	(46.4%)	(40.9%)

Table 4: Follow-up Doctor Vs. Counseling Offered

Follow doctor up counselling offered	Physician		Family physician		Registrar		S.H.O	
	Yes	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
Diet	96.7%	3.3%	100%	0.0%	92.3%	7.7%	82.4%	17.6%
Low salt intake	96.7%	3.3%	100%	0.0%	92.3%	7.7%	86.6%	13.4%
Low-fat intake	96.7%	3.3%	96.4%	3.6%	92.3%	7.7%	84.0%	16.0%
High fruit intake	84.4%	15.6%	92.9%	7.1%	92.3%	7.7%	80.8%	9.2%
High Vegetable Intake	84.4%	15.6%	89.3%	10.7%	92.3%	7.7%	84.0%	16.0%
Weight Loss	90.0%	10.0%	96.4%	3.6%	92.3%	7.7%	95.0%	5.0%
Exercise	90.0%	10.0%	82.1%	17.9%	92.3%	7.7%	94.1%	5.9%
Mental Relaxation	77.8%	22.2%	100%	0.0%	100%	0.0%	95.0%	5.0%
Smoking Counseling	65.6%	34.4%	67.9%	32.1%	84.6%	15.4%	84.0%	16.0%
Alcohol Counseling	46.7%	53.3%	50.0%	50.0%	76.9%	23.1%	78.2%	21.8%

SHO- Senior House Officer

Table 5: Follow-up Location Vs. Counseling About The Nature Of Hypertension

	PHC Centre	**Private medical facility**	**Governmental medical facility**
Yes	33.7%	45.5%	20.8%
No	20.9%	45.2%	20.4%

DISCUSSION

In 2009, a paper reviewed many studies investigating adherence to medication among patients with chronic conditions in Middle Eastern countries, including Sudan. A comprehensive literature search yielded 19 relevant studies that focused on the extent and predictors of non-adherence to medication adherence across different conditions, including hypertension. Patients gave a wide range of reasons for non-adherence to medications, which included a lack of health education (Al-Qasem et al., 2011). According to the AHA (American Heart Association) paper on medical training to achieve competency in lifestyle counseling, "AHA emphasized the importance of lifestyle in its 2020 goals for cardiovascular health promotion and disease reduction." (Hivert et al., 2016).

In Sudan, health services are provided at all three levels: primary, secondary and tertiary levels in both the private and governmental sectors.(Salim & Hamed, 2018) Most patients obtain medical treatment and counseling during their treatment, but sadly, many doctors do not have the knowledge and are not trained enough (Belaid et al., 2020). Consequently, this increases costs for investigations and treatment or even hospital admissions. Nonetheless, an educated doctor who has good knowledge about the significance of counseling and its contents and consequences can provide suitable information to patients.

A slight modification in the lifestyle behavior of the patient can positively impact the outcomes of even chronic diseases such as hypertension just by appropriate counseling to the patient and motivating them to implement the plan set by themselves with the assistance of their doctor to achieve the best possible control for the patient blood pressure and decreasing the risk for complications. A lifestyle modification such as diet (DASH) has significantly decreased SBP and DBP for as long as 18 months in patients with good adherence in a randomized control trial (Poggio et al., 2019).

Patient counseling is a process that involves doctors, pharmacists or healthcare personnel who advise about the method of intake of medicine and precautions, either in the form of prescription or verbally, to patients, their family members or caretakers (Mináriková et al. 2019). In this study, the focal aim was to study the quality of counseling about lifestyle modifications received by hypertensive patients and assess and compare the quality offered by SHOs, registrars, family physicians and physicians concerning the location (Arija et al., 2018). In 25 of the 35 interviews conducted, only one lifestyle modification counseling was offered. In 7 visits, counseling about 2 topics was given: 3 times weight loss and diet combined, 3 times diet and exercise; and 1 time exercise and smoking. In 3 visits, advice on 3 topics was combined

(weight loss, diet and exercise), but the counseling never accommodated all the lifestyle modifications.

A significant statistical difference was noted in the distribution of participants (PHC center, private medical facility or governmental facility) vs. the doctor they followed up with (physician, family physician, registrar or SHO). In contrast, the counseling about the nature of hypertension vs. location of follow-up was statistically indifferent; almost half of all the participants who received counseling about hypertension followed up at a private medical facility. However, the same is true for half of the participants who did not receive counseling. Considering that all the doctors were available at the three locations, we can assume that the quality of counseling depends on the doctor rather than the location.

Approximately a quarter of all participants had complications, half of whom followed up with an SHO, of which only a quarter received counseling about complications. We may consider the reason behind this fallout is that SHOs have limited knowledge because of a lack of years of experience. Also, this might be due to their limited time to see each patient and the fact that hypertensive patients with complications should follow up with a specialist.(Hernandorena et al., 2017) The participants who had complications followed up at a PHC center and a private medical facility equally, while the remaining followed up at a governmental facility. Through these findings again, we can assume that the quality of counseling depends on the doctor rather than the location. However, unfortunately, there is a prevalent belief among the Sudanese people that patients receive better health care services in private facilities.(Salim & Hamed, 2018) Approximately half of the participants who had complications had hypertension for 11-20 years, while most complication-free participants had hypertension for 5 years or less.

The location of the follow-up showed an association, with almost half of the participants with controlled blood pressure followed up at a private medical facility. Blood pressure control vs. age group was statistically significant (p=0.005), where the controlled blood pressure was most observed in the age group 50-59 years, uncontrolled blood pressure was most frequent in the age group 60-69 years in consensus with a study carried in which individuals aged ≥60 years had significantly lower rates of blood pressure (Mente et al., 2018). Blood pressure control among sexes was close to equal; 55.6% were males, and 44.4% were females, which agreed with the same research study performed in the USA; women had lower blood pressure control rates than men (Alabousi et al., 2017). However, in another study, the females had higher attainment of controlled blood pressure levels, where 75.7% of males and 90.0% of females attained their target blood pressure (Ademe et al., 2019).

CONCLUSIONS
The current study has concluded that the quality of counseling offered to hypertensive patients depends on

the doctor rather than the location; in almost half of the participants who followed up with SHOs, including half of the participants with complications, only a quarter received counseling about complications that may arise from hypertension. The counseling was for above-average, hypertensive patients with complications who tended to follow up either at a PHC center or a private facility, especially given that private facilities have the largest amount of participants with controlled blood pressure. Counseling a patient about lifestyle modification is a priority according to the 2014 Sudanese guideline for managing hypertension in adults; lifestyle modification should be recommended for all people with hypertension and pre-hypertension.

RECOMMENDATIONS
The current study recommends educating doctors and especially SHOs through brief lectures about different aspects of lifestyle modification counseling and its importance for hypertensive patients. Exploring the barriers to achieving a 100% in all lifestyle counseling categories, such as social habits cessation, can be sought out by physicians to know their reasons for the lack of asking. Creating and handing out simple brochures about lifestyle modifications and their importance to hypertensive patients in clinics, PHC centers, and hospitals would also be a helpful initiative.

Ethical Approval
Permission from the Hospital/PHC center administration was obtained. The study also received its ethical clearance from SIRB (SUMASRI Institutional Review Board, University of Medical Sciences and Technology). The study's protocol, aims and benefits were explained to all the participants, and written voluntary informed consent was obtained from each participant.

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