

## GHANAIAN HYPERTENSIVE PATIENTS UNDERSTANDING OF THEIR MEDICINES AND LIFE STYLE MODIFICATION FOR MANAGING HYPERTENSION

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Received: 14 Jan 2014 Revised and Accepted: 01 Feb 2014

### ABSTRACT

**Objective:** To evaluate the level of knowledge of hypertensive patients with regard to administration of medicines and life style modifications for the management of hypertension, as this can affect control levels.

**Methods:** Five hundred and sixteen (516) patients were interviewed using a semi structured questionnaire which captured data on patients knowledge on the purpose, side effects, frequency, duration of medicines and life style modification for managing hypertension.

**Results:** One hundred and ninety three (37%) of the patients were males and 323(63%) were females. One hundred and eighty four (36%) had middle school education. Two hundred and one (39%) were aware of side effects of medicines dispensed for the management of hypertension whereas 490(95%) knew the frequency of administering antihypertensive dispensed. The mean antihypertensive knowledge score obtained was 2.6221 [SD: 1.30816] out of 5. The p - value obtained for the effect of education on patients knowledge on the administration of antihypertensive 0.000. Three hundred and twenty respondents (62%) and 195 (37%) of respondents were aware of lifestyle modification such as reducing dietary salt intake and avoiding cigarette smoking. The mean score obtained for respondents knowledge on life style modification was 2.4981[SD: 1.25334] The chi square test value obtained for the effect of gender and educational background on patient knowledge on life style modification for the management of hypertension were [13.294, df=4, p=0.010], [26.603, df=16,p=0.046] respectively.

**Conclusion:** Patient's knowledge on the administration of medicines and lifestyle practices for the management of blood pressure can be graded as average. There is the need for initiates to address counselling and monitoring of hypertensive patients with regard to their therapy (both medicines and lifestyle practices) in settings where the number of health professionals are limited and literate levels are low.

**Keywords:** understanding, hypertension, medicines, lifestyle modification

### INTRODUCTION

Currently cardiovascular diseases are on the increase in countries in Sub-Saharan African including Ghana. The prevalence of hypertension in rural and urban Ghana ranges from 19% to 48%. [1] There is evidence that life style modifications and adequate control of blood pressure with medicines can help manage hypertension effectively and prevent complications such as stroke [2]. Low levels of treatment and control of hypertension have been reported in Ghana, one review indicated that treatment levels range from 6.9% to 52.5. % while control levels range from 1.7 % to 12.7. %. [3] Inadequate control of blood pressure may be related to patient barriers such as lack of knowledge on hypertension and its treatment (therapy related factors), cultural beliefs, access to care, high cost of medicines and discontinuation of medicines as a result of side effects. [4-6] Insufficient knowledge of hypertensive patients about the administration of their medication and life style modifications could lead to non-adherence to therapy and then low control of their blood pressure. [7]

Low to average levels of knowledge on administration of hypertensive medicines and life style modification for managing hypertension patients have been reported among hypertensive patients both in the developed and developing countries. Iyalomhe & Iyalomhe (2010) found out that of one hundred and eight hypertensive patients sampled only thirty percent knew the name of at least one antihypertensive drug used. [8] In turkey of two hundred and twenty seven hypertensive patients surveyed sixty four percent knew the name of their medicines whereas forty three percent were aware of side effects of medicines. These authors further reported that knowledge of hypertensive patients on the duration of use and purpose of antihypertensive prescribed significantly affected adherence rates. [9] One study in Canada

indicated that most hypertensive patients are not aware of function of their medicines but knew a few side effects such as increased urination, dizziness, and oedema. In addition eighty five percent and twelve percent of hypertensive were aware of lifestyle modification practices such as reducing salt intake, and smoking cessation respectively. [10] In Mangalore, India forty five percent of hypertensive patients studied had poor knowledge while seven percent had good knowledge on life style modification practice for the management of hypertension. The highest perceived barrier of life style modification practices related to hypertension was lack of knowledge. [11] Furthermore of two hundred hypertensive patients interviewed in Nigeria seventy four percent were not aware of the role of reduced salt, sixty eight percent were unaware of smoking cessation and sixty three percent were unaware of the role of reducing weight in the management of hypertension. [12] In Ghana several researchers have studied the prevalence, detection and control of hypertension in rural and urban localities in the country, [3] however not much work has been done to assess therapy related factors with regard to the control of the blood pressure of hypertensive patients. In addition therapy related factors documented in other studies may be different from our setting. Therefore the aim of the study was to evaluate the level of knowledge of hypertensive patients with regard to administration of medicines and life style modifications for the management of hypertension. The information obtained would be very essential for the purposes of policy initiation and planning with regard to the pharmaceutical care of hypertensive patients.

### MATERIALS AND METHOD

This was a prospective study carried out at three selected hospitals in the Greater Accra and Ashanti Region. These included Komfo Anokye Teaching Hospital (K.A.T.H) in the Ashanti region which

serves the northern sector of the country, the Korle-Bu Teaching Hospital which serves the southern sector and the Kwame Nkrumah University of Science And Technology (KNUST) hospital which serves KNUST and other surrounding communities. These hospitals were chosen because they run weekly clinics for hypertensive patients; hence it was easier to sample patients from these settings. Three sampling methods were used, cluster and purposive sampling to select the hospitals and systematic sampling to select the hypertensive patients. Criteria for sampling hypertensive patients included patients who have had hypertension for more than six months with no comorbidities who patronized the weekly hypertensive clinics. The number of hypertensive patients sampled was based on the equation  $\text{Sample Size} = (Z\text{-score})^2 \cdot \text{StdDev}^2 / (\text{margin of error})^2$  [assuming a 95% confidence level, 0.5 standard deviation, and a margin of error (confidence interval) of +/- 5%.] Based on this equation a sample of 385 respondents was needed but the researchers decided to sample 516 hypertensive patients. The semi structured questionnaire used to capture data was designed by the researchers based on information from literature on what patients should know with regard to administration of medicines and life style modification adjunct to medicines for the management of hypertension. The semi structured questionnaire captured the following: socio- demographic and clinical characters, anti-hypertensive prescribed, patient's knowledge on dosage, frequency, duration, side effects and the purpose of their anti-hypertensive. In addition knowledge and performance on five lifestyle modification such as aerobic exercise at least 30 minutes per day, four days per week, reducing dietary salt to less than 6g NaCl per day, limiting alcohol intake to less than 3 units per day for men and less than 2 units day for women, avoiding cigarette smoking and eating a diet high in fruits, nuts and vegetable and low in fat. The semi structured questionnaire was face validated by one practicing hospital and community pharmacist, two hypertensive patients and an academic pharmacist. In addition the questionnaire was piloted among 15 hypertensive patients at the Kumasi South Hospital in the Ashanti region from the 12<sup>th</sup> to the 19<sup>th</sup>

of December 2011. Data was collected at KATH and the KNUST Hospital from the 3<sup>rd</sup> of January -1<sup>st</sup> March 2011 and from 20<sup>th</sup> December 2011 to 30<sup>th</sup> March 2012 at KBTH. Data was collected by two trained undergraduate pharmacy students. During data collection 30 patients were sampled each week during the weekly hypertensive clinics by selecting the first 30 hypertensive patients who were within our inclusion criteria who came to the hospital's pharmacy for their medicines. Face to face interviews were then conducted after the patients consent has been sought. In addition ethical clearance was sought from the pharmacy directorate and management of the hospitals before data was collected. Data was analysed using Statistical Package for Social Sciences (SPSS) 16.0. In calculating individual patients overall knowledge score on medicines prescribed if patient was on two or more medicines, the score on each medicine was calculated and the average knowledge score was calculated and that was used as the patients overall knowledge score on medicines. In addition in determining patients knowledge on medicines prescribed each attribute stated by the patient on each medicine was counted as one. P values less than 0.05 were considered to be significant. To determine respondents' knowledge score on the life style modification for managing hypertension, a scoring system was employed where patients were given a score on each life style modification known, with a total of 5 marks being awarded for excellent knowledge; 4 - very good ; 3- average ; 2 - poor; 0-1 - very poor knowledge.

## RESULTS

### Demographic and Clinical Data

The minimum age was 28 years and the maximum age was 91 with a mean of 57, (SD 11.6638). Seventy (14%) had no education, 106(20%) had basic education and 184(36%) had middle school education. Three hundred and eighty (74%) were married and 89(17%) were single. ninety eighty respondents (22%) had their blood pressure levels less than or equal to 140/90. Modifiable risk factors identified included smoking 45(8%) and alcohol use (17%). (Table 1)

**Table 1: Socio-Demographic and Clinical Characteristics of Respondents (n=516)**

Variable	N (%)
<b>Gender</b>	
Male	193(37%)
Females	323 (63%)
<b>Educational level</b>	
No education,	70 (14%)
Basic	106(20%)
Middle school	184(36%)
Secondary	79 (15%)
Tertiary	77 (15%)
<b>Marital status</b>	
Married	380 (74%)
Single	89 (17%)
Divorced	47(9%)
<b>Blood pressure (BHS Classification)</b>	
≥140/90	98 (22%)
≥141-159/91-99	186 (41%)
≥160/100	191 (38%)
<b>Modifiable risk factors</b>	
Smokers	45 (8%)
Alcohol use	89 (17%)

### Medicines Prescribed For the Management of Hypertension

Eight antihypertensive were prescribed 906 times for 516 respondents. (Table 2) The classes of antihypertensive prescribed included calcium channel blockers 360(41%), diuretics 249(27%) and ACE Inhibitors/A2RB 164 (18%). The common calcium channel blockers prescribed were amlodipine and nifedipine while bendrofluzazide was the commonest diuretic prescribed. One hundred and eighty seven (36%) of patients were prescribed one antihypertensive, 275(53%) were prescribed two antihypertensive and 54 (11%) were prescribed three antihypertensive.

### Assessment of Patient Knowledge on Anti- Hypertensive

Two hundred and one (39%) were aware of side effects of medicines dispensed for the management of hypertension whereas 430(81%) respondents knew the purpose antihypertensive dispensed. Two hundred and eighty three (55%), 490 (95%) and 490 (95%) of respondents recalled names, duration of therapy and frequency of administering antihypertensives respectively. The mean antihypertensive knowledge score obtained was 2.6221 [SD: 1.30816] out of 5. With regard to the overall knowledge score 138(27%) of respondents were aware of all the five attributes

assessed, 107 (21%) were aware of four attributes, 137 (27%) were aware of three attributes, 80 (15%) were aware of two attributes and only 54 (10%) were aware of one attribute. Sources of information on medicines administration were pharmacies (68%) doctors (20%), nurses (10%) and others (2%). A chi square value obtained for the effect of gender, education and location on patients knowledge on the administration of antihypertensive was [13.753, df5, p=0.017]; [1.087, df20, p=0.000], [5.015, df5, p=0.514] respectively.

#### Assessment of Patient Knowledge on Lifestyle Modification

Mean knowledge score on life style modification was 2.4981 [SD: 1.25334] out of 5. One hundred and fifty five (30%) were aware of all the five life style modifications assessed, 93(18%) of respondents were aware of four, 160(31%) were aware of three, 77(15%) were

aware of two, 26(5%) were aware of one and 5(1%) were aware of none of the lifestyle modifications assessed. Three hundred and eleven 311(60%) respondents were aware of the life style modification regular aerobic exercise at least thirty minutes per day however only 125 (40%) were practicing it. More men 142 (74%) were aware of this lifestyle modification than females 169 (52%). (Table 3).

The chi square value obtained for the effect of educational background and hospital attended on patient knowledge on life style modification for the management of hypertension were [26.603, df=16,p=0.046] and [25.926, df=4, p=0.000] respectively. Reasons cited by patients for not adhering to life style modification includes fruits are not affordable, finds it difficult to exercise and cannot avoid the intake of alcohol and cigarettes [Table 4].

**Table 2: Medicines Prescribed for Managing Hypertension and side effects sited by patients.**

Name Of Medicine	Frequency	Common Side-effects sited by patients'
1. Amlodipine	50	Fast heartbeat, headache
2. Nifedipine	45	Tremor, GIT disturbance
3. Bendrofluazide	40	Plenty urination, feels weak
4. Lisinopril	24	Cough, headache, tremor
5. Atenolol	18	Palpitation headache
6. Candesartan	10	Nausea
7. Atacand Plus	7	GIT Disturbance palpitation
8. Amlodipine+ Bendrofluazide	80	Headache, plenty urination, dizziness
9. Nifedipine+ Bendrofluazide	45	Polyuria, GIT disturbance
10. Amlodipine+Lisinopril	35	Drowsiness,sleepy, cough
11. Nifedipine+Lisinopril	30	Tremor, GIT disturbance
12. Bendroflumethiazide+Lisinopril	25	Frequent urination, nausea
13. Amlodipine + Atenolol	10	Palpitation, nausea
14. Nifedipine+Methyldopa	15	Headache
15. Nifedipine+Atenolol	8	Fast heart beats
16. Nifedipine+Atacand Plus	8	Drowsiness, headache
17. Bendrofluazide+Methyldopa	7	Drowsiness, fast heart beat
18. Candesartan+Methyldopa	7	Dizziness
19. Nifedipine+Lisinopril+Bendrofluazide	15	Headache, dizziness
20. Amlodipine+Atenolol+Bendrofluazide	11	Heart burns,nausea
21. Lisinopril+Bendrofluazide+Methyldopa	10	Frequent urination
22. Nifedipine+Atenolol+Bendrofluazide	8	Nausea, headache
23. Nifedipine+Lisinopril+Bendrofluazide+Methyldopa	8	Cough,headache

**Table 3: Patients Knowledge On Life Style Modification Compared With Demographic Characteristics**

	Aerobic Exercise At least 30 Minutes Per Day, Four Days Per Week? (N=311) [AP=125]	Reducing Your Dietary Salt To Less Than 2.4g Per Day (N=320) [AP=135]	Limiting Alcohol Intake (N=237) [AP=195]	Avoiding Cigarette Smoking (N=195) [AP=155]	Eating A Diet High In Fruits, Nuts And Vegetables And Low In Fat (N=303),[AP=150]	P-Value (*P<0.05)
<b>Gender</b>						
Male	142	135	119	99	134	0.000
Female	169	185	116	96	169	
<b>Educational Level</b>						
Tertiary	54	49	38	34	49	0.046
Secondary	61	58	47	40	49	
Middle	116	116	94	72	109	
Primary	58	65	47	41	51	
No education	22	32	1	8	45	
<b>Location</b>						
KATH	37	61	13	3	46	0.000
KBTH	196	199	193	188	184	
KNUST	78	51	31	4	73	
<b>Alcohol Intake</b>						
Yes	60	78	57	54	80	0.089
No	251	242	180	141	223	
<b>Smokes cigarette</b>						
Yes	35	27	40	39	42	0.067
No	276	293	197	156	261	

\*N = Number of Patients Aware Of Life Style Modification , \*AP= Number of Patients Practicing Lifestyle Modification Stated

**Table 4: Reasons Given By Respondents for Not Complying With Lifestyle Modification**

Reasons	Frequency (N)
Do not have money to buy fruits	20
Vegetables are expensive	18
I do not have money to buy vegetables and fruits	15
Finds it difficult to get the fruits	10
Fruits are not affordable	8
Do not have time to buy fruit	5
Mixed eating habits and find it difficult to quit smoking	12
Finds it difficult to quit smoking,	17
Cannot quit smoking, do not have access to fruits	9
Cannot avoid smoking and alcohol intake	7
Cannot avoid the intake of alcohol	22
Cannot quit the intake of salt	19
Do not have time to exercise plus cannot quit salt intake	2
Cannot avoid the intake of salt as well as buy fruits continuously	9
Fruits are costly also the nature of my job is exercise	2
Forgotten, Simply not exercising, would start	8
Feels lazy to exercise	14
Cannot exercise regularly, don't have money to buy fruits	8
Feels going to work is exercise, not enough time to exercise	4
Finds it difficult to exercise regularly	13
Cannot exercise regularly	15
I cannot exercise because I have pains in the leg	5
Exercising makes me weak	10

## DISCUSSION

### Demographic and Clinical Characteristics.

More than 50% of our study sample was females 323(63%). This compares well with similar studies in Turkey, India, USA and Nigeria, where more than 50% of the population sampled were females. [9, 10, 12, 13.] In our study about 38% of our sample had blood pressure levels above 160/100, this differs from a similar study in Nigeria in which about half (53.5%) of patients interviewed had their blood pressure measurement categorized as stage II (>160/100) based on JNC 7 classification. [11] Eight percent 8% of our sample were smokers which compares well with studies in France where 9% of their study sample were active smokers. [14]

### Medicines Prescribed For the Management of Hypertension

The common classes of antihypertensive prescribed were calcium channel blocker (41%) and diuretics (27%) and this is in line with the management of primary hypertension recommended by the Ghana standard treatment guidelines and the National Institute of health and Clinical Guideline (NICE)<sup>[15, 16]</sup>. However in a similar study in Turkey the common classes of antihypertensive prescribed were ACE Inhibitors (49.8%), diuretics and calcium channel blockers [10]. This pattern differs slightly from our study probably due to racial differences. In our study 64% of respondents were prescribed combination therapies. This differs from studies in Nigeria and Turkey where a greater proportion 85.5% and 53.7% respectively of hypertensive patients sampled were prescribed combination therapies [9, 10]. This may indicate that most at times hypertensive patient are prescribed combination therapies and this is appropriate because these combination therapies are safe and more effective [17].

### Patients Knowledge on Medicines prescribed for Managing Hypertension

Fifty-five percent, 92%, 81 and 28% of respondents in our study could respectively recall the name, duration, purpose of therapy and the side effects of antihypertensive prescribed. Related finding in other research in Turkey found out that 64%, 97%.80% and 43% knew the name, duration, purpose of therapy and side effects of antihypertensive dispensed. A study conducted by Jolles *et al* (2013) in Canada also found out that 43%of respondents were aware of side effects of antihypertensive dispensed [10,11]. Furthermore similar studies in France indicated that 77 % of hypertensive patients sampled were able to recall the names of their antihypertensive medicines [14 ] This may imply patients are mostly aware of the

purpose and duration of therapy of their antihypertensive than the side effects of these antihypertensive, however awareness of the names of antihypertensive varies across various researches. It essential that patients are made aware of some common side effects of their antihypertensive as this could reduce unnecessary anxiety when patients starts experiencing these side effects. With regard to patients knowledge on name of antihypertensive every patient should be aware of this attribute as this could reduce some dispensing errors. Some pharmacy staff may make mistakes while dispensing, and if patients are knowledgeable of the names of their anti-hypertensive enquires could be made and any errors may be corrected. The mean antihypertensive knowledge score obtained was 2.6221 [SD: 1.30816] out of 5. From these scores patients knowledge on antihypertensive can be graded as average. There is therefore the need to improve the patient's knowledge on the administration of medicines as studies have found out that these could improve adherence to therapy and improve blood pressure control. [7] However the question here is, whose responsibility is it to counsel hypertensive patients on their medicines. In our findings the main sources of information on medicines administration were pharmacies (68%). In a similar study in Turkey, sources of information on medicines administration were physicians (63%), pharmacists (18%) and nurses (14%). [10] Pharmacists and physicians, by the virtue of their training are trained to provide such education, but the pharmacist who is the custodian of medicines is expected to provide such education. In addition the pharmacist is often the last person the patient sees before leaving the hospital. The sixth report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC VI) concludes that, "In particular, pharmacists should be encouraged to monitor patients' use of medications, to provide information about potential adverse effects, and to avoid drug interactions. [2]. However in countries like Ghana were the pharmacist patient ratio is very wide, it's very difficult to offer such counselling and monitoring services. Secondly in Ghana, there are no guidelines or policies concerning who should educate hypertensive patients about their medication because both pharmacists and physicians by virtue of their education are trained to do so. In these hospitals were these studies were conducted patients were counselled at the counter when medicines were dispensed, no educational and written information was given. In addition medicine labels are handwritten. There is the need for the various organisations such as the Ministry of health, Pharmacy Council Ghana; in conjunction with pharmacy directorate of the various hospitals to develop guide lines to improve medication counselling especially for hypertensive patients of low level of education as educational background has an effect on

patient's knowledge on their medicines. These counselling could be patient centred and in a conducive environment, and also other pharmacy staff and trainees could assist in counselling and monitoring. Furthermore counselling could be supported with pictorial aids such as educational leaflets.

### Patients Knowledge on lifestyle modification For Managing Hypertension

Sixty percent (60%), 62% and 59% of respondents were aware of lifestyle modification adjunct to the management of hypertension such as regular exercise; reduce salt intake and eating a diet high in fruits, vegetables and low in fat. respectively In addition 38% were aware of avoidance of cigarette smoking and 46% were aware of reduction in alcohol intake. In the United State a similar study conducted indicates that of hypertensive patients interviewed 78% of patient's reported receiving advice on regular Exercise, 69.3% were aware of reducing salt intake, 61.9 % were aware eating habits and 43.5% were aware of advice on reduced alcohol intake<sup>[13]</sup>. Thirty percent (30%) of hypertensive patients interviewed in South Africa reported that they received advice on the benefits of exercise, 69% were advised on reduced salt intake and 50% on a balanced diet. Forty four (44%) of respondents were advised on reduced alcohol intake and 35% were advised on cigarette smoke cessation<sup>[18]</sup> Comparing these two studies to our findings life style practices patient are less familiar with are reduced alcohol intake and smoke cessation, probably because counselling on these life style modification are more directed toward hypertensive patients who practice these lifestyle. However this should not be the case, ideally all hypertensive patients should be aware of these lifestyle modification so that any future tendencies could be curtailed. In our study although 62% of respondents were aware of the practice of reducing salt intake as a measure to help regulate their blood pressure only 42% were actually practicing this. Common reasons given by respondents for not adhering to this practice were that they could not avoid salt intake and quit salt intake. From these responses it can be inferred that counselling was not rightly done. It is very important that patients are counselled effectively with regard to this practice since a study carried out by Cappuccio *et al* (2006) in Ghana showed that educating the community to reduce salt intake was effective in lowering blood pressure. In Ghana most households prepare their meals rather than patronising processed food so it is easier for people to regulate their salt intake when they are efficiently educated on the benefits [19]. With regard to the practice of avoidance of cigarettes smoking although 36% of respondents were aware 20% of them was still smoking. Reasons giving for this practice includes cannot quit smoking could not avoid smoking and finds it difficult to quit smoking. These reasons are not startling. In Ghana there are no smoke cessation services/support in government or private hospitals and community pharmacies. The practice of quitting smoking depends solely on the patient. There is therefore the need for a government policy spearheaded by the ministry of health to issue guideline with reference to smoke cessation. For instance in the United Kingdom NICE have issued a policy guideline on the establishment smoke cessation services in primary care [20]. The mean knowledge score on life style modification was 2.4981 [SD: 1.25334] out of five, from these scores patients knowledge on lifestyle modification for managing hypertension can be graded as average. There is therefore the need to improve patient's knowledge and awareness of life style modification for managing hypertension. [21, 22, 23] However the critical question here is whose responsibility is to ensure that the patients are adequately educated and assisted to practice life style modification essential for the management of hypertension. Several researches in the developed countries have indicated that the pharmacists, nurses and physicians interventions are efficient in upgrading the patient's awareness and practice of these modifications: Interventions studied comprised face to face counselling with educational materials during quarterly or regular visits to the hospital. To offer effective and efficient life style modification counselling services it is essential that each hospital management considers its staff capacity and then decide which intervention (Pharmacist, doctor, nurse) would be suitable for the hospital so that this aspect of care for hypertensive patients is not overlooked. In countries where these health personals are limited

there could be a cartoon on life style modification on screen for the patients to watch whiles at the clinic to support counselling given. Furthermore peer education among hypertensive patients could also be studied and utilised if outcomes are positive.

### CONCLUSION

The level of knowledge on administration of hypertensive medicines and life style modification for managing hypertension is average. In addition there is a significant relationship between patient's knowledge on their medicines and life style practices for managing hypertension and educational level. There is the need for policies to be drawn and implemented to enhance the care of hypertensive patients. Interventions to improve the knowledge of hypertensive patients on their medicines should focus on educating them on the names and side effects of their medicines. Furthermore there is the need to improve patients counselling during dispensing of medicines especially for patients with low literacy rate. Ways of effectively communicating and monitoring life style practices of patients in low resourced settings with regard to health personals should also be explored.

### COMPETING INTERESTS

The authors declare that they have no competing interests.

### AUTHORS' CONTRIBUTIONS

AFAM&MOA & IIS : Conception, design, acquisition and analysis of data

AFAM & MOA& FTOD: Drafting of manuscript and revising it

AFAM& FTOD & IIS : Revising and approval of final manuscript to be published

### ACKNOWLEDGEMENTS

All participants in the study.

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