

**Effect of the Patient Activation Measure (PAM)  
on Chronic Care:  
Baseline Findings from a Cluster Randomized Study**

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# Research Team

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# Background

- A recent Institute of Medicine report suggested new directions in quality measurement, recommending that measures should focus on the patient and patient experiences.
- It was recommended that these measures be integrated in healthcare delivery and should improve patient care.
- The Agency for Healthcare Research and Quality (AHRQ) reports annually on the Nation's healthcare quality. A key concept of quality is **patient centeredness**.

# Background

- AHRQ has noted evidence of the importance of patient centeredness:
- Patient centeredness approaches to care that rely on building a provider-patient relationship, improving communication techniques, and fostering a positive atmosphere have been shown to improve the health status of patients.
- A patient centered approach has been shown to lessen the symptom burden on patients.
- Patient centered care encourages patients to comply with and adhere to treatment regimens.
- Patient centered care reduces the chance of misdiagnosis due to poor communication.
- Source: Request for Task Order, AHRQ, May, 2005 (p.1)

# The Patient Activation Measure<sup>\*</sup>

- A scale that assesses patient self-reported knowledge, skill, and confidence for self-management of one's health or chronic condition.
- Hibbard and colleagues first developed a 22-item version and shortened the measure to a 13-item version.
- There are four stages indicating different levels of patient “activation” or readiness to self-manage.

<sup>\*</sup>Hibbard et al: Health Services Research 2005; 40:1918-1930.

# Patient Activation Measure

- PAM indicates that patients progress through four stages as they become activated.
  - 1) They come to believe their role in their own care is important.
  - 2) They learn enough and develop enough confidence to act on their own behalf.
  - 3) They actually act.
  - 4) They reach the point where they can act even under stress.
- By using the PAM to identify a patient's stage of activation, caregivers can individualize their care plans. PAM can also be used to assess how well such interventions work.

# Specific Aims

- To determine whether the PAM-driven intervention increases patients' knowledge and self-management skills, measured by both PAM scores and hypertension-specific measures
- To determine whether the PAM-driven intervention improves hypertension patients' systolic and diastolic BP

# PAM-driven Interventions

- Used the PAM score and stage to diagnose individual patients' capabilities for self management
- Developed stage-specific interventions for chronic care management of hypertension



# 13-Item PAM

1. When all is said and done, I am the person who is responsible for managing my health condition.
  - 2. Taking an active role in my own health care is the most important factor in determining my health and ability to function.
- 
- 3. I am confident that I can take actions that will help prevent or minimize some symptoms or problems associated with my health condition.
  - 4. I know what each of my prescribed medications does.
  - 5. I am confident that I can tell when I need to go get medical care and when I can handle a health problem myself.
  - 6. I am confident I can tell my health care provider concerns I have even when he or she does not ask.
  - 7. I am confident that I can follow through on medical treatments I need to do at home.
  - 8. I understand the nature and causes of my health condition.
- 
- 9. I know the different medical treatment options available for my health condition.
  - 10. I have been able to maintain the lifestyle changes for my health that I have made.
  - 11. I know how to prevent further problems with my health condition.
- 
- 12. I am confident I can figure out solutions when new situations or problems arise with my health condition.
  - 13. I am confident that I can maintain lifestyle changes, like diet and exercise, even during times of stress.

# Assessment of the Belief that Active Role is Important

- 1. When all is said and done, I am the person who is responsible for managing my health condition.
- 2. Taking an active role in my own health care is the most important factor in determining my health and ability to function.

**Answer categories:**

Strongly Agree, Agree, Disagree, Strongly Disagree

# Assessment of the Level of Confidence & Knowledge to Take Action

- 3. I am confident that I can take actions that will help prevent or minimize some symptoms or problems associated with my health condition.
- 4. I know what each of my prescribed medications does.
- 5. I am confident that I can tell when I need to go get medical care and when I can handle a health problem myself.
- 6. I am confident I can tell a doctor concerns I have even when he or she does not ask.
- 7. I am confident that I can follow through on medical treatments I need to do at home.
- 8. I understand the nature and causes of my health condition.

## **Answer categories:**

Strongly Agree, Agree, Disagree, Strongly Disagree

# Assessment of the Ability to Take Action

- 9. I know the different medical treatment options available for my health condition.
- 10. I have been able to maintain the lifestyle changes for my health that I have made.
- 11. I know how to prevent further problems with my health condition.

**Answer categories:**

Strongly Agree, Agree, Disagree, Strongly Disagree

# Assessment of the Ability to Stay the Course Under Stress

- 12. I am confident I can figure out solutions when new situations or problems arise with my health condition.
- 13. I am confident that I can maintain lifestyle changes, like diet and exercise, even during times of stress.

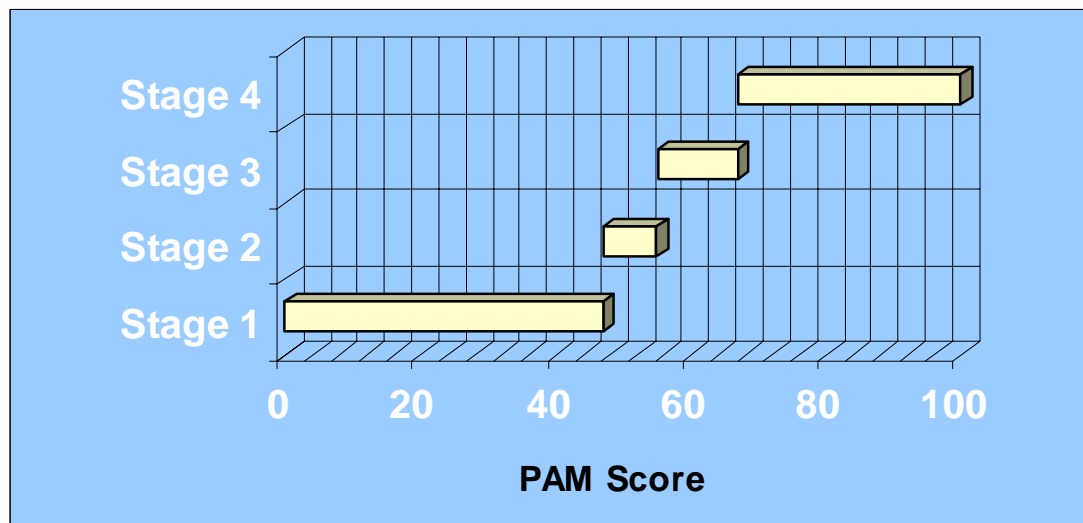
## **Answer categories:**

Strongly Agree, Agree, Disagree, Strongly Disagree

# Identifying the PAM Stage by Assessment Score

To identify a patient's Stage, the responses to the 13 questions are calculated and converted into an PAM Score with the use of a tool developed by Hibbard and colleagues. The VNS Research Center team provided care managers with the score and stage for each patient in the intervention.

***The higher the score, the higher the activation level.***



# Patient Activation Continuum

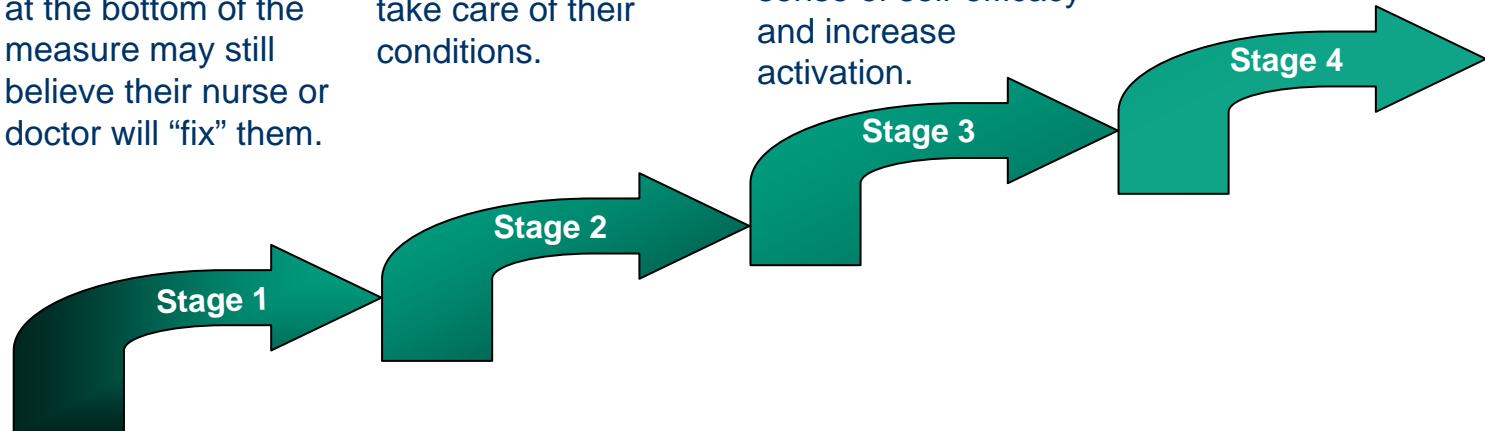
## Four Stages of PAM

Members who score at the bottom of the measure may still believe their nurse or doctor will “fix” them.

Members who score somewhat higher, may understand they must be involved in their healthcare, but lack the knowledge and confidence to take care of their conditions.

Members who score in the upper half are beginning to gain confidence to take on self-management behaviors and need to experience small successes to build a sense of self-efficacy and increase activation.

Members scoring in the upper range have the confidence and skills to manage their health, but may need help with maintaining their progress during stressful times.



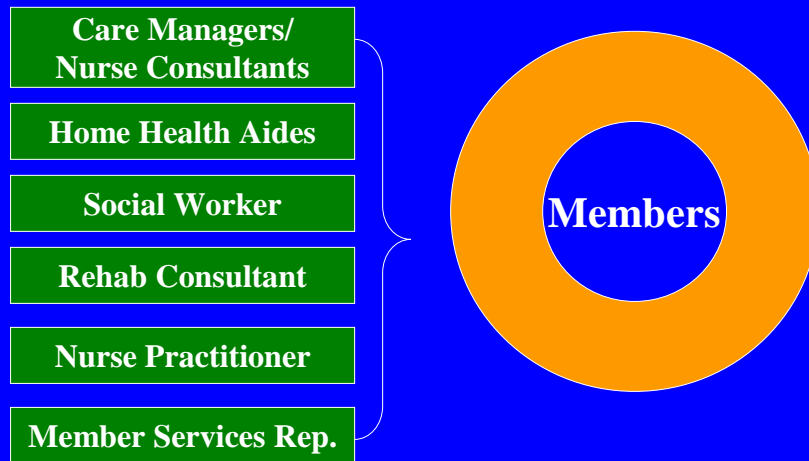
# VNS CHOICE

- Managed long term care program funded by Medicaid through a contract with the New York State Department of Health
- Individualized care planning and care management are integral to the VNS CHOICE program model
- VNS CHOICE has interdisciplinary teams that are deployed across New York City's five boroughs

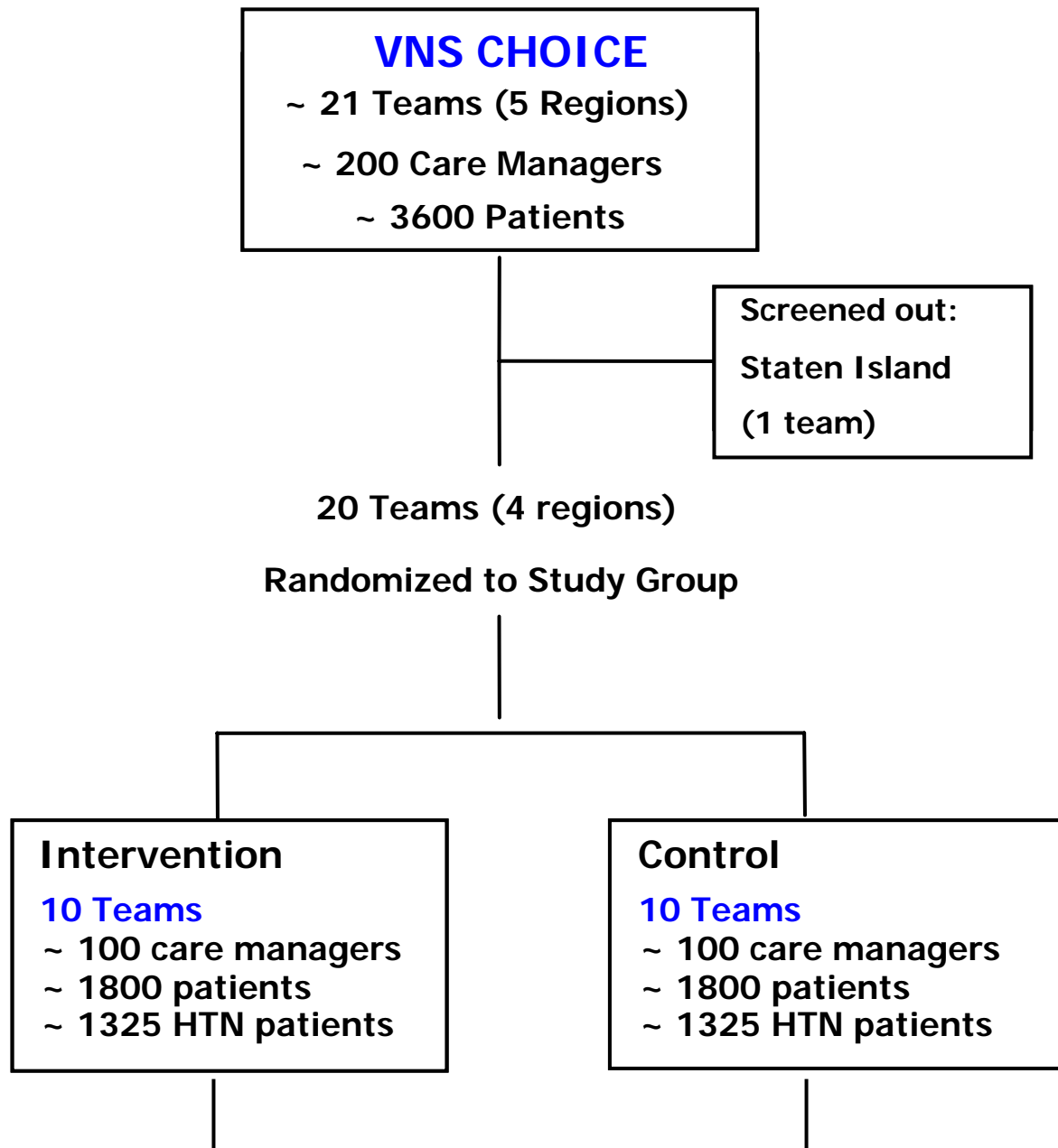


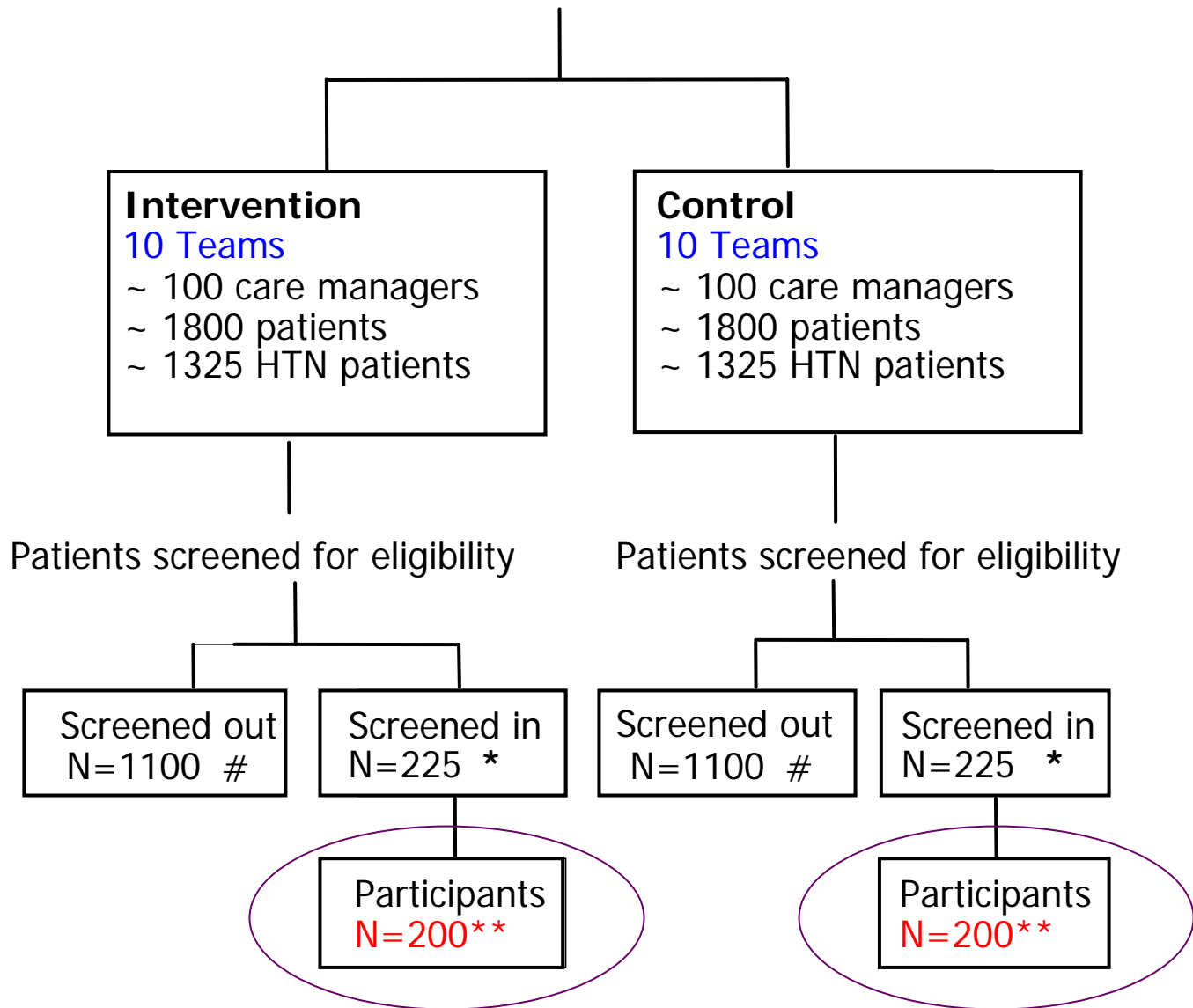
# VNS CHOICE Teams

## VNS CHOICE Interdisciplinary Teams



- Interdisciplinary teams in the managed long-term care plan were randomly assigned to intervention or control status (usual care).
- Care Managers, on the Intervention teams, were trained to use the change package in conjunction with a patient's PAM score to design – with the involvement of the patient – an individualized hypertension management plan.
- The impact of the intervention on patient activation and hypertension outcomes will be assessed.





# Active patient with LOS > 360 days and/or cognitively impaired

\* Active patient with LOS < 360 days & cognitively intact

\*\* Patients who agree to participate assuming a 10% refusal rate

# Outcomes

As part of the effectiveness analysis, we will examine:

- 1) changes in patients' PAM scores
- 2) differences in patients' hypertension knowledge and in their reported adherence to hypertension medication and diet recommendations
- 3) average changes in patients' systolic and diastolic BP
- 4) percent of patients who achieve BP control, among those with uncontrolled hypertension at baseline
- 5) BP control maintenance, among those with controlled baseline BP

# Eligibility Criteria

1. Active VNS CHOICE patient on one of the 20 Intervention or Control teams at the start of the intervention period
  2. In care for less than or equal to 360 days
  3. Have a formal diagnosis of hypertension (using appropriate ICD codes recorded in the patient record)
  4. English speaking
- Two additional criteria were applied at the baseline patient interview:
    1. consent to enroll in the study and
    2. absence of moderate or severe cognitive impairment as measured by the short portable mental status questionnaire (Pfeiffer 1975).

# Data Collection

- Baseline PAM, blood pressure and hypertension-specific knowledge and self-management information were collected by “blinded” study interviewers from all eligible participants via a face-to-face in-home interview.
- Follow-up patient-level measures, including systolic and diastolic BP, PAM score and hypertension-specific knowledge and skills were collected by blinded research interviewers approximately 6 months after each patient’s admission to the study.

# Statistical Analysis

- VNS Choice teams were randomized into 2 groups:
  - Usual care and
  - PAM intervention
- Random Effects Models with random intercept were used, to account for the fact that clustered participants are not independent and randomization is at the team level with outcomes measured at the individual level.
- We also computed the Intra-Class Correlation



# Intra-Class Correlation (ICC)

$$ICC = \frac{\sigma_c^2}{\sigma_c^2 + \sigma_r^2}$$

where

$\sigma_r^2$  = residual variance **or** within group variance

$\sigma_c^2$  = variance due to clustering **or** between group variance

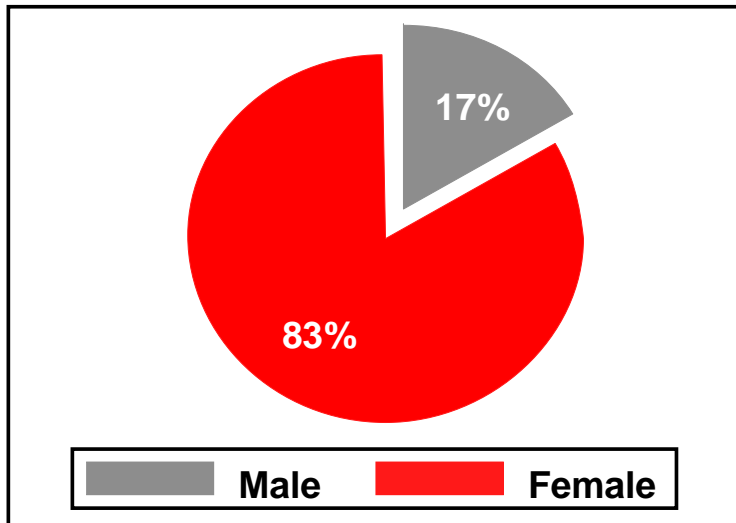
$\sigma_c^2 + \sigma_r^2$  = total variance

# Summary of Baseline Findings

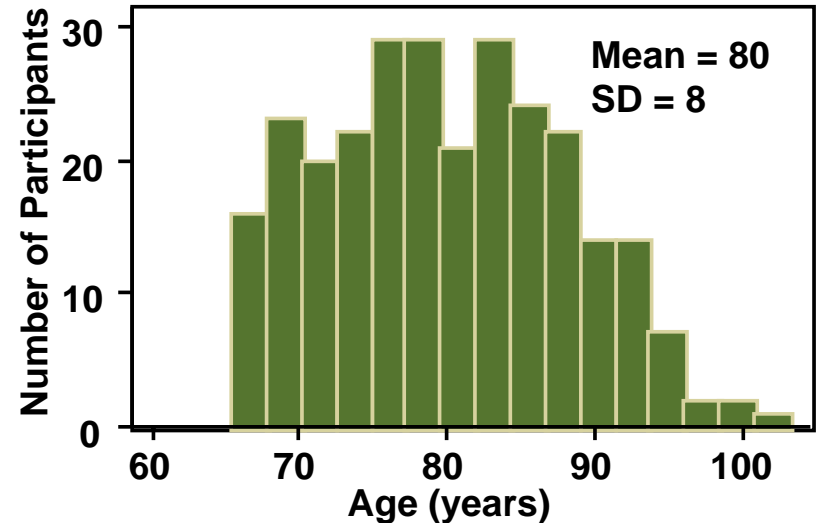
- Demographics of the study group
- Clinical characteristics of study group
- Distribution of independent and dependent variables
- Usual Care vs PAM Intervention group comparisons
- Relationship between these variables and PAM scores: Predictors of PAM

# Demographics of the 275 Participants to the PAM Intervention Study

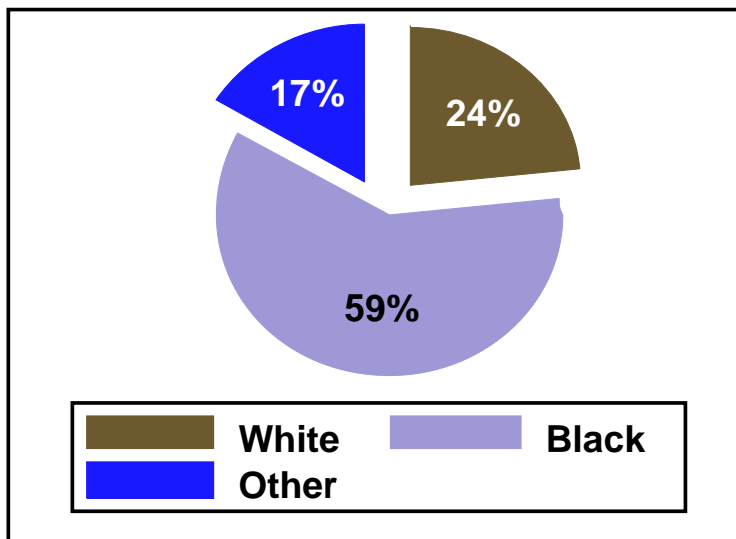
## Sex



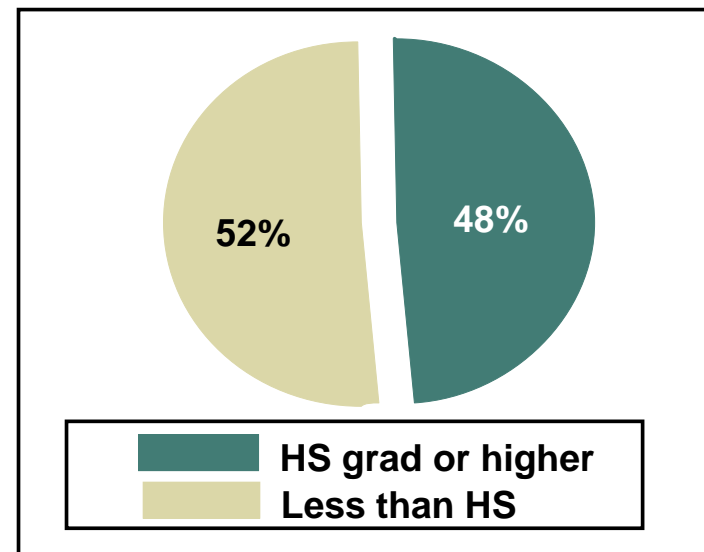
## Age



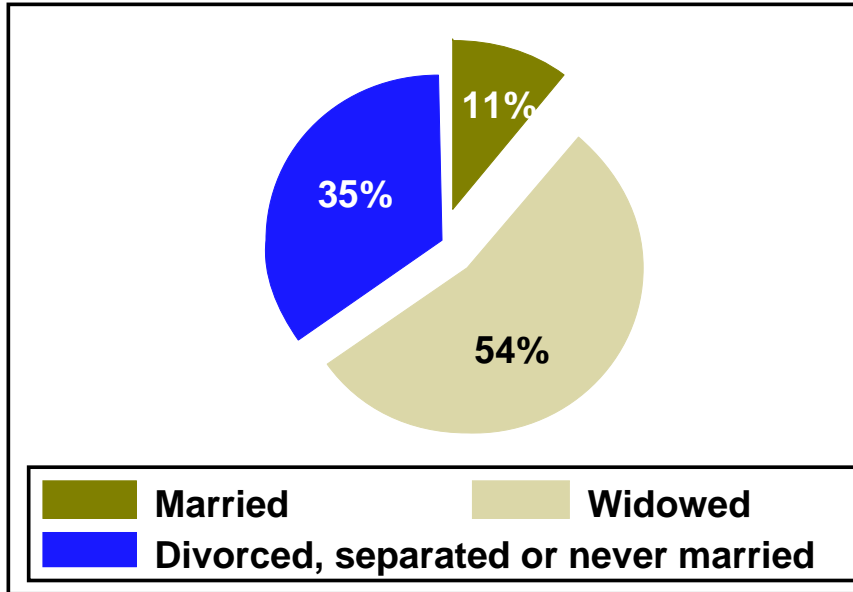
## Race



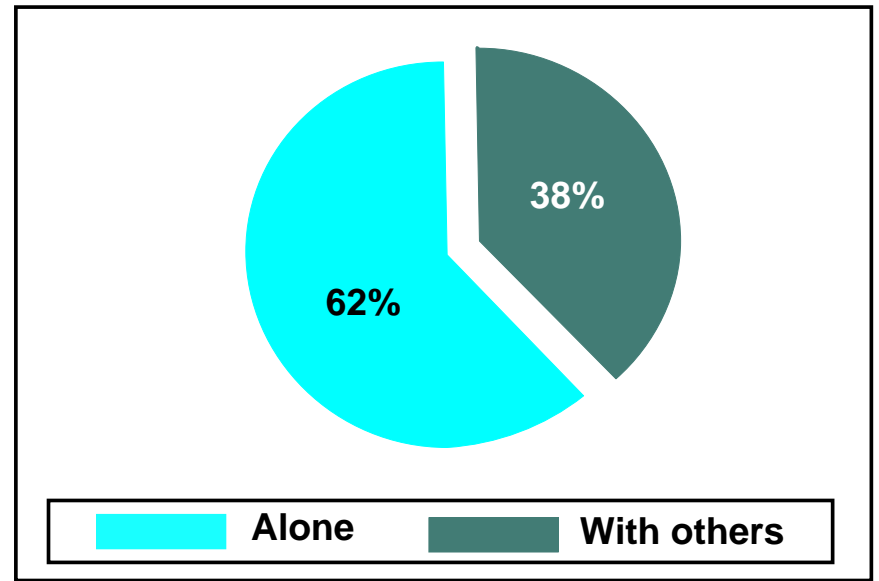
## Education



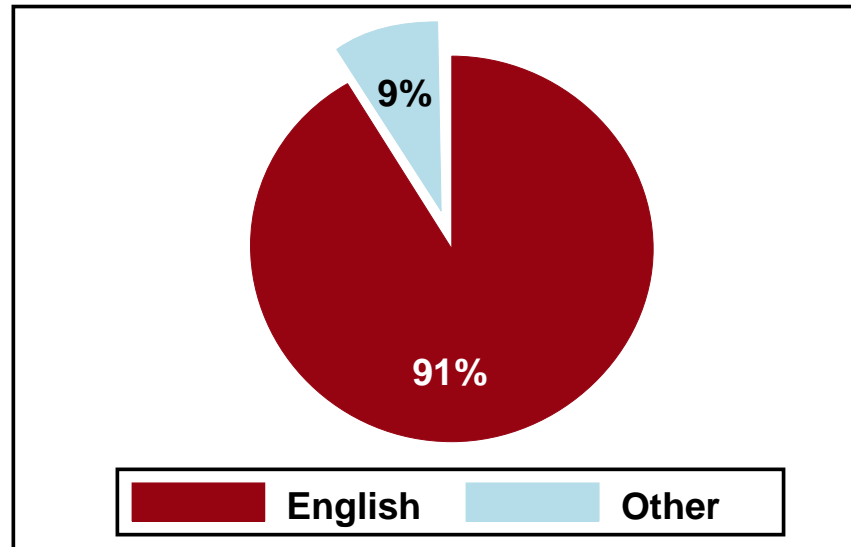
### Marital Status



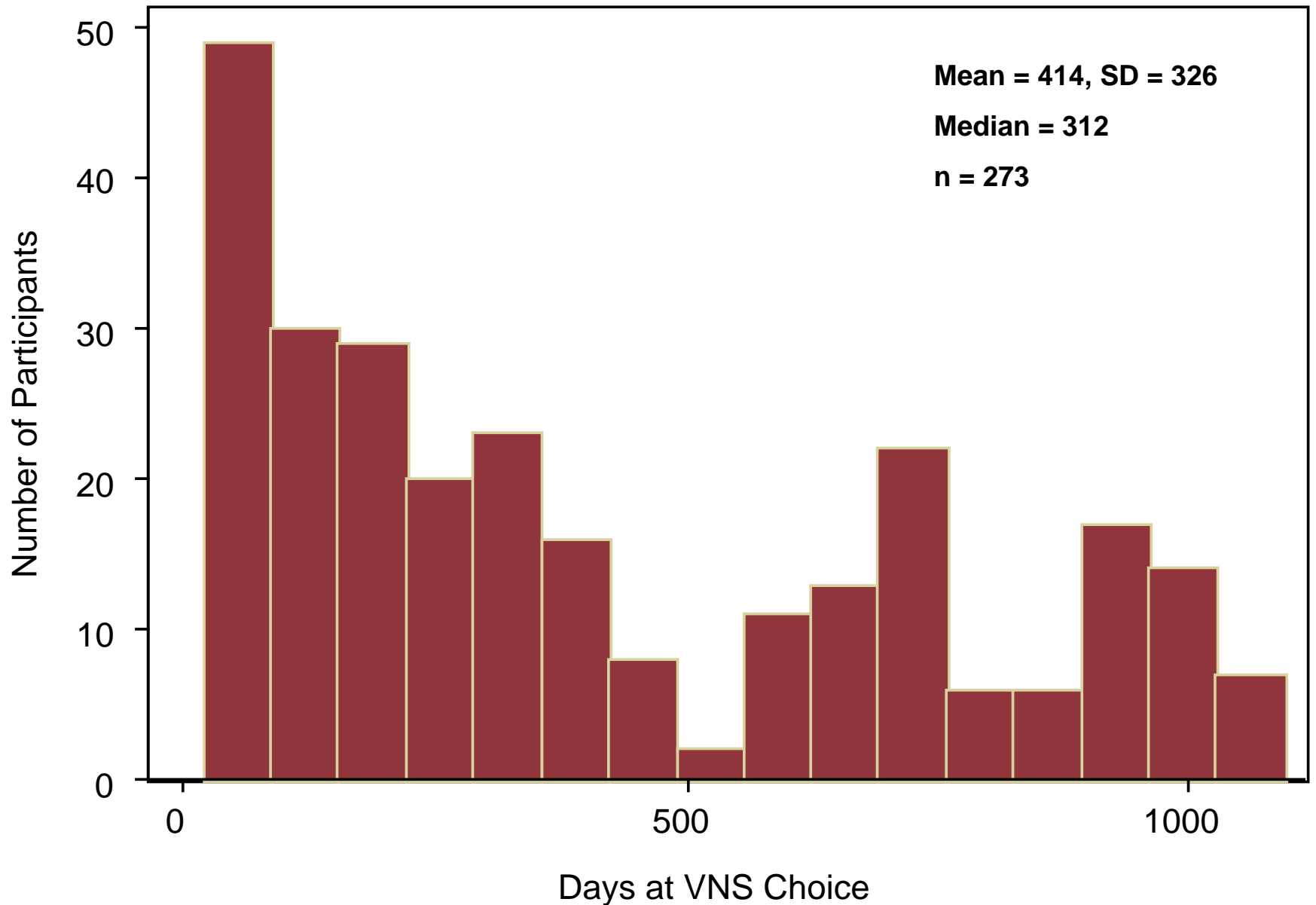
### Living Arrangements



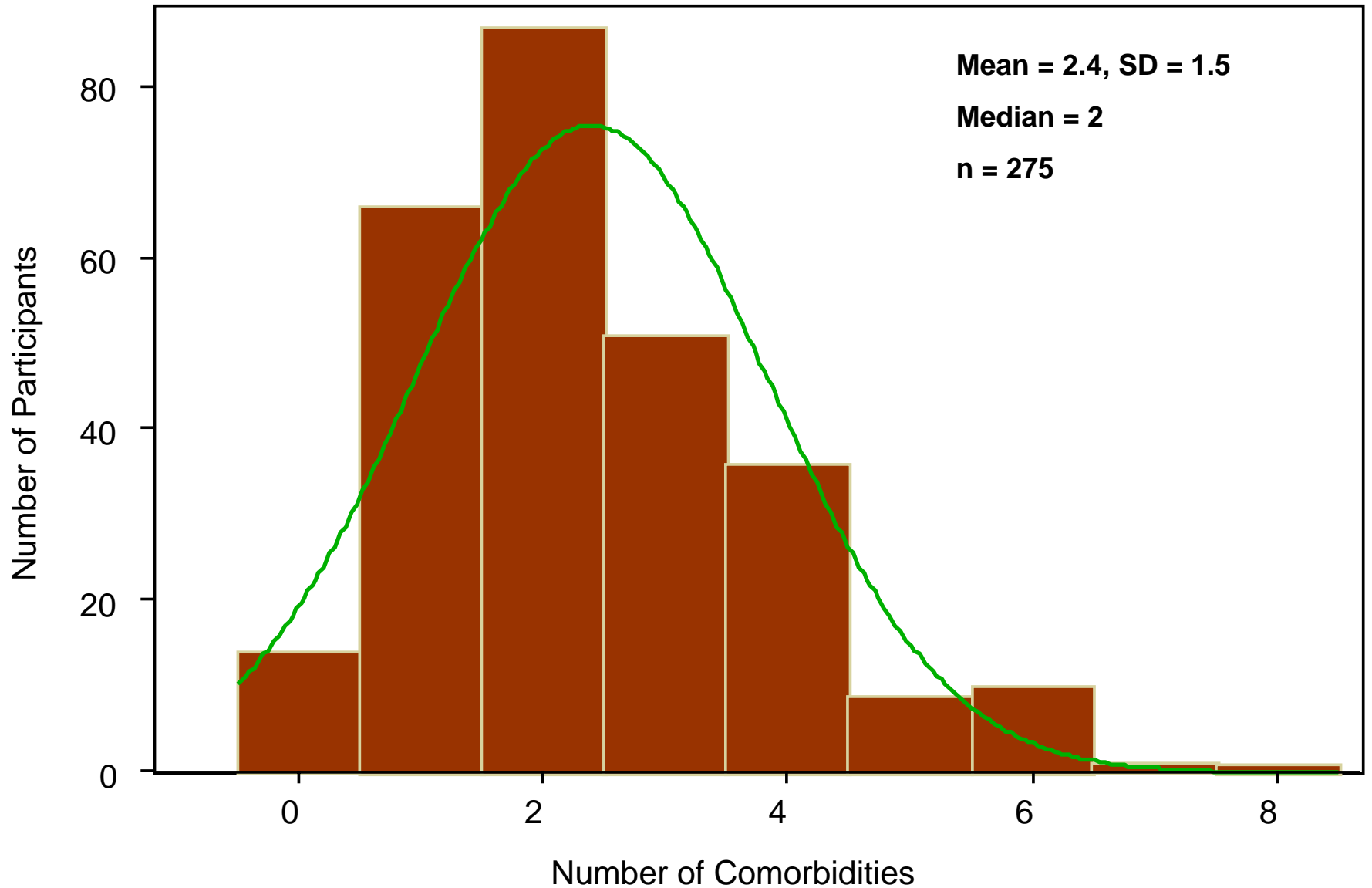
### Preferred Language for Conversations



# Time with VNS Choice (days)

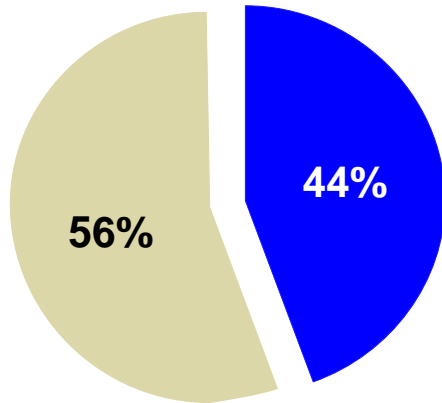


# Number of Comorbidities

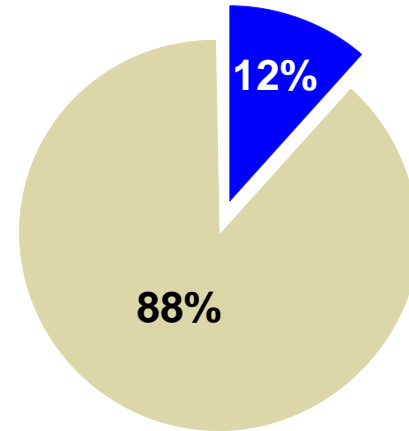


# Medical Conditions

Diabetes

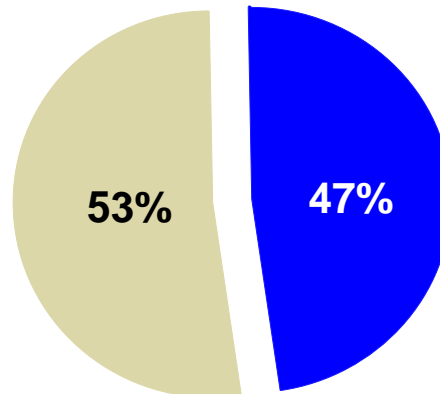


Renal disease

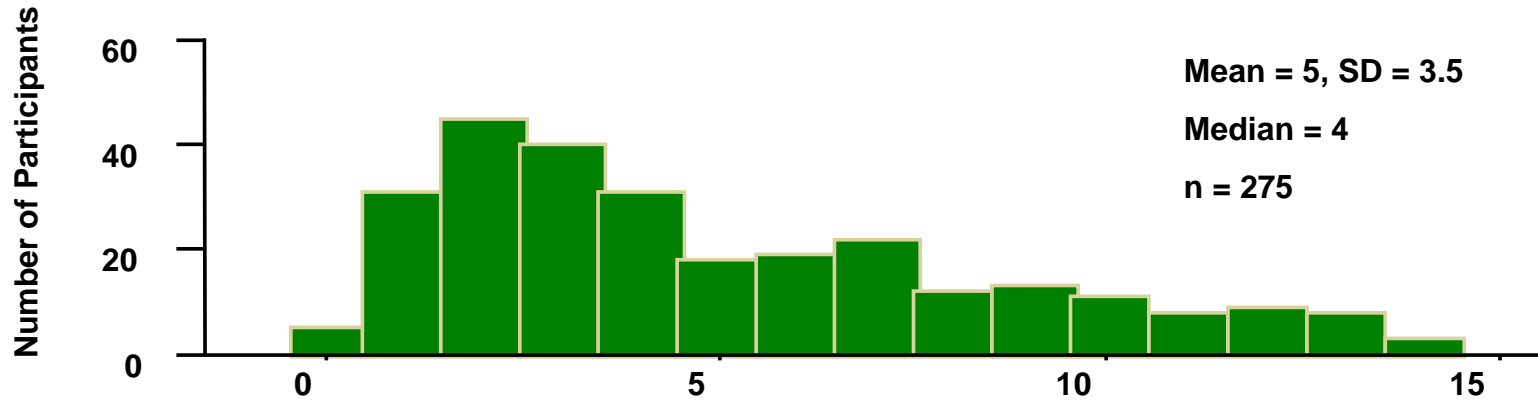


Diabetes and/or Renal Disease

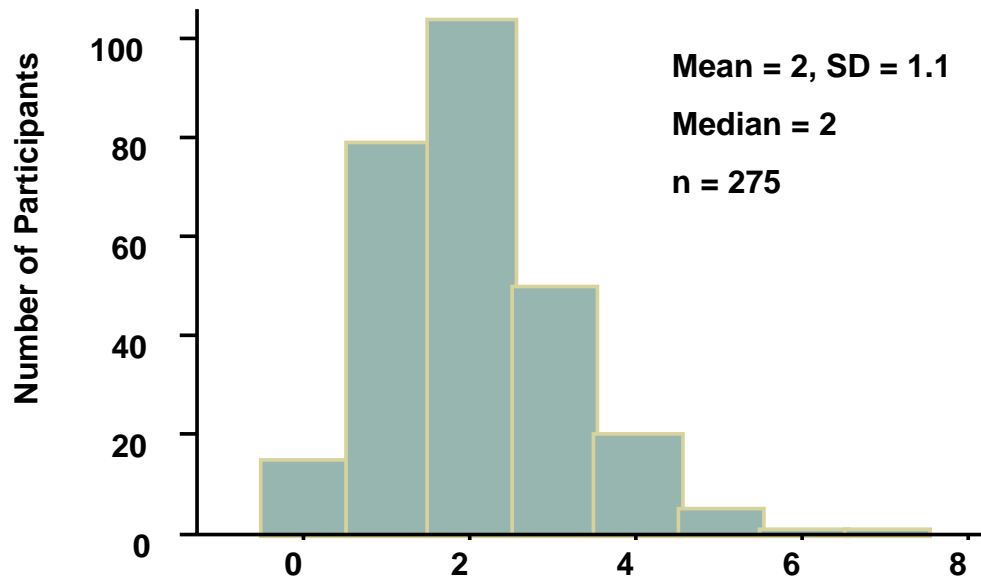
 Yes  
 No



# Total Number of Medications



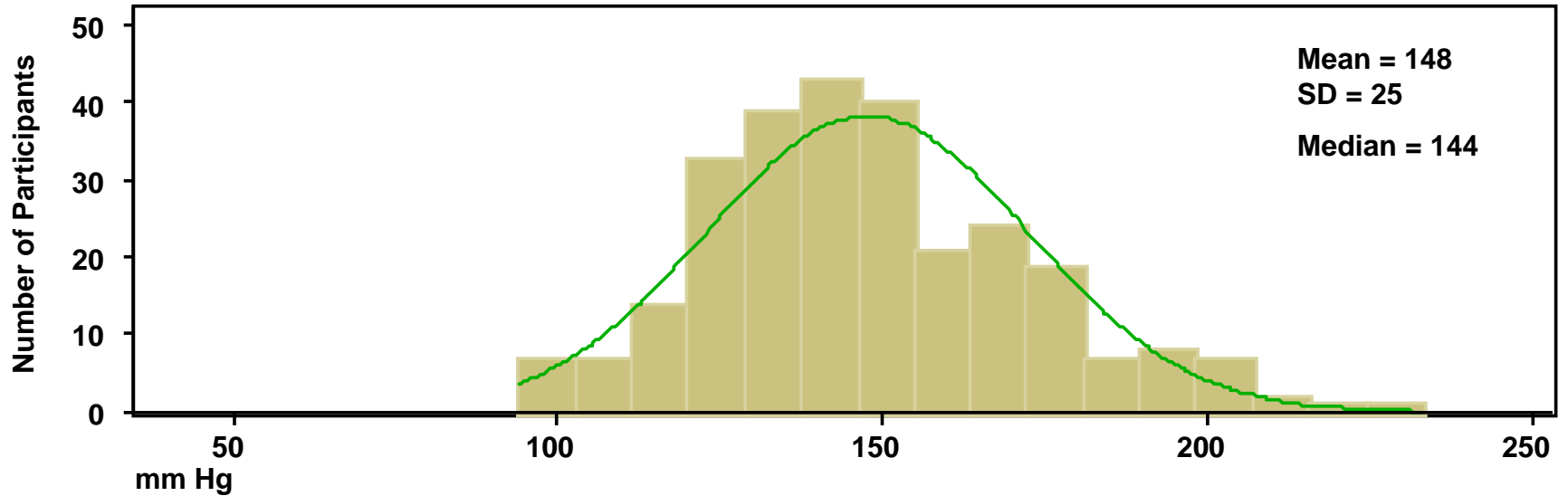
# Number of Hypertension Drugs



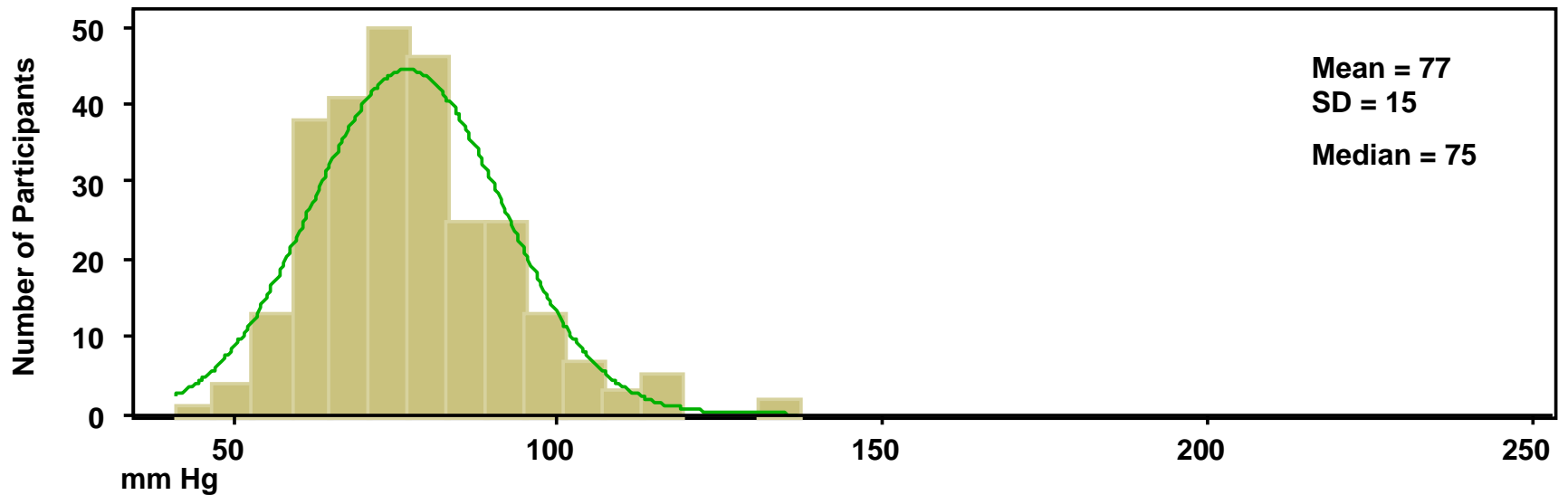


# Baseline Blood Pressure

## Systolic

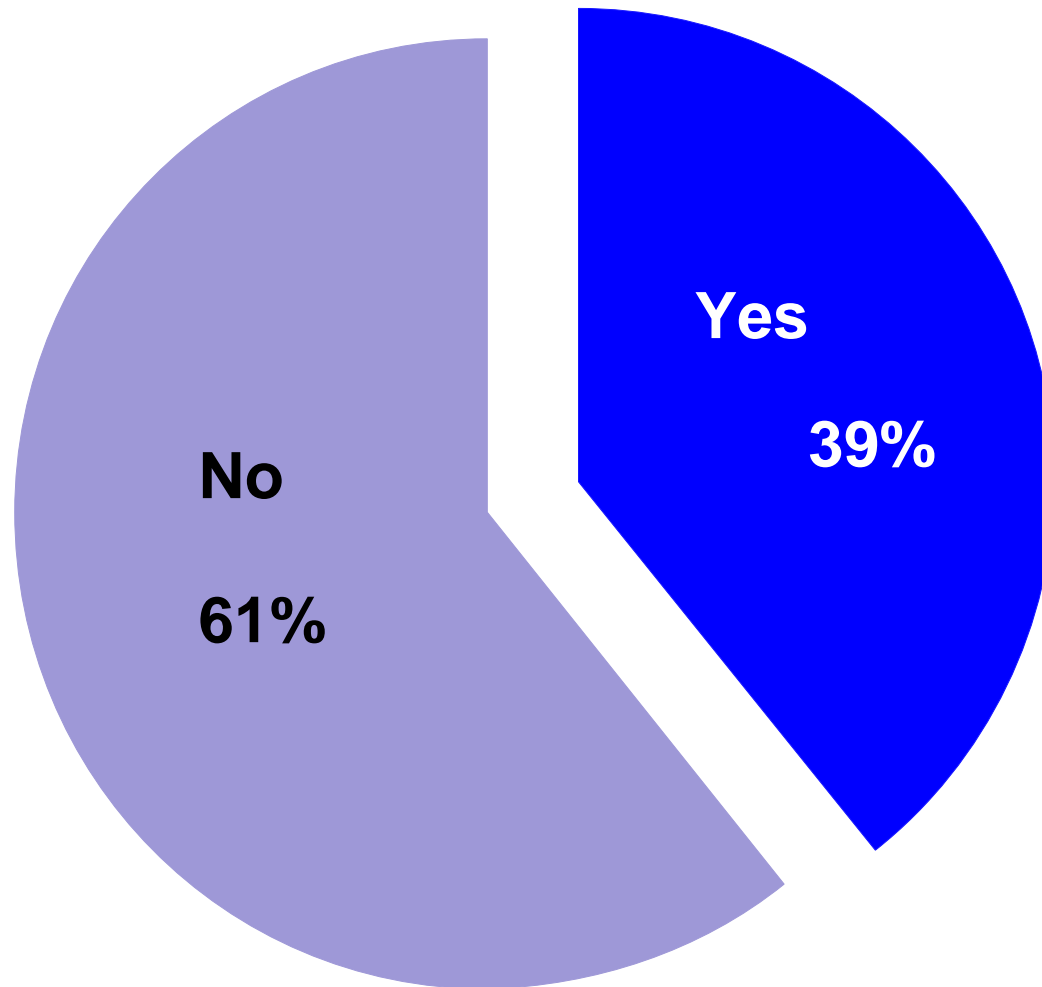


## Diastolic

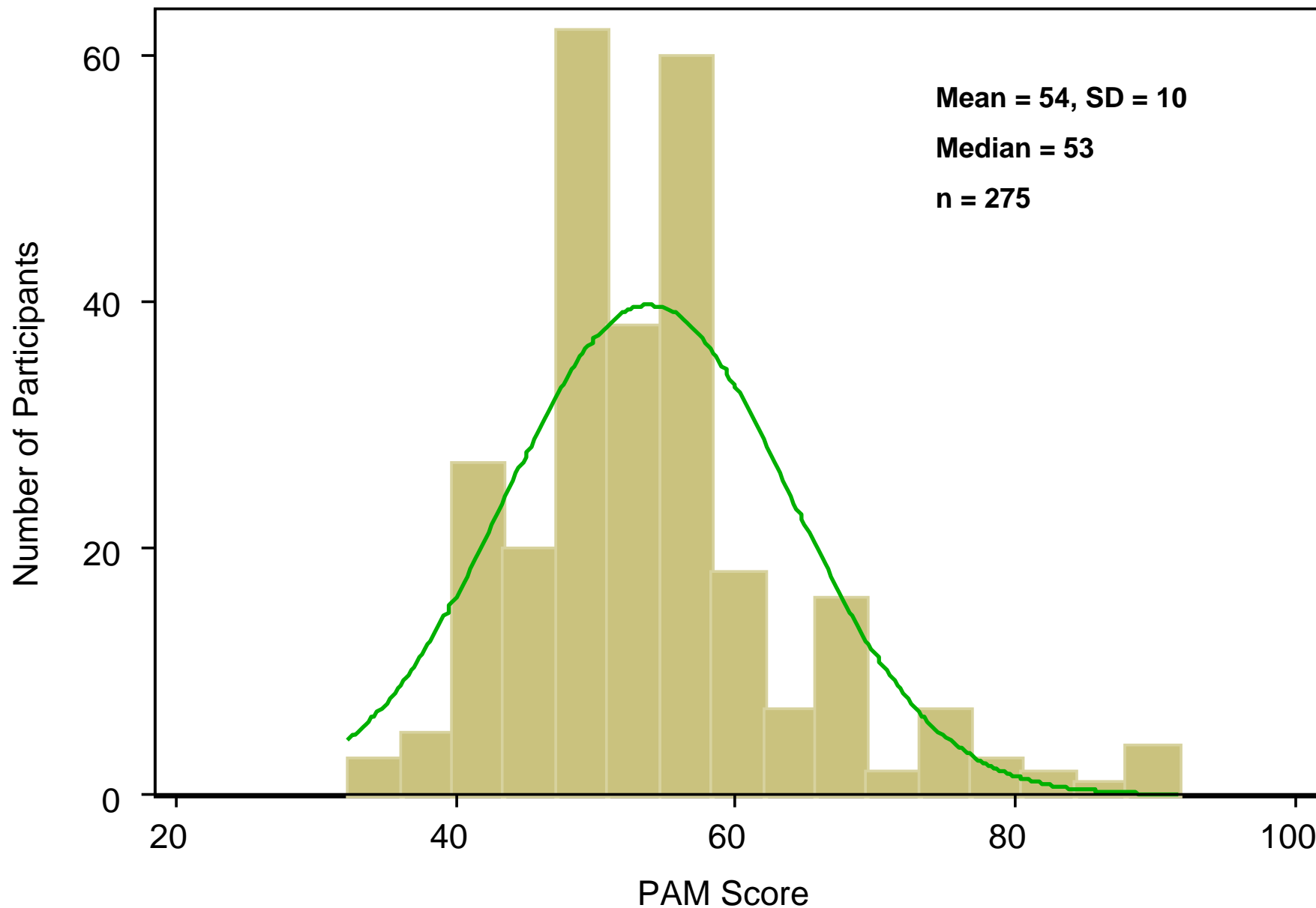


# Controlled Blood Pressure

Systolic < 140 and Diastolic < 90

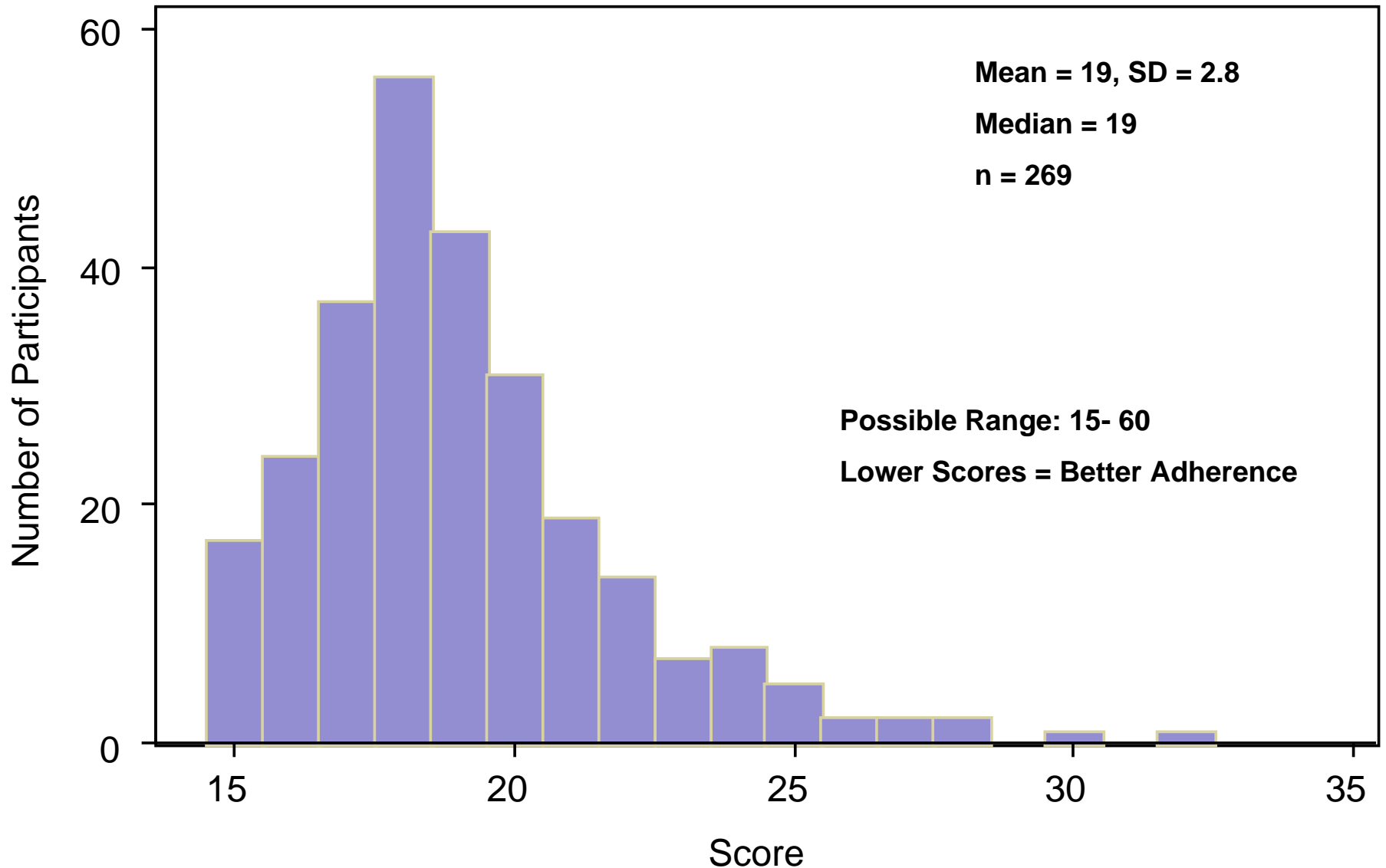


# PAM Activation Scores



# Adherence to Medication and Dietary Advice

## Hill-Bone Compliance Scale



# The Patient Assessment of Chronic Illness Care (PACIC)\*

- A 20-item patient-report instrument that assesses patient's receipt of clinical services and actions consistent with the chronic care model.
- Respondents rate, on a 5-point scale, ranging from 1 (no or never) to 5 (yes or always) how often they experienced the content described in each item during the past 6 months.
- Five subscales, including one called "Patient Activation"

\*Glasgow et al: Med Care 2005;43:436-444.

T1

### Your Chronic Illness Care

Staying healthy can be difficult when you have a chronic illness. We would like to learn about the type of help with your condition you get from your health care team. This might include your regular doctor, his or her nurse, or physician's assistant who treats your illness. Your answers will be kept confidential and will not be shared with anyone else.

When I received care for my chronic illness over the past 6 months, I was:

	<u>Almost Never</u>	<u>Generally Not</u>	<u>Sometimes</u>	<u>Most of the Time</u>	<u>Almost Always</u>
1. Asked for my ideas when we made a treatment plan.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
2. Given choices about treatment to think about.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
3. Asked to talk about any problems with my medicines or their effects.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
4. Given a written list of things I should do to improve my health.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
5. Satisfied that my care was well organized.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
6. Shown how what I did to take care of my illness influenced my condition.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
7. Asked to talk about my goals in caring for my illness.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
8. Helped to set specific goals to improve my eating or exercise.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
9. Given a copy of my treatment plan.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
10. Encouraged to go to a specific group or class to help me cope with my chronic illness.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
11. Asked questions, either directly or on a survey, about my health habits.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>

T2

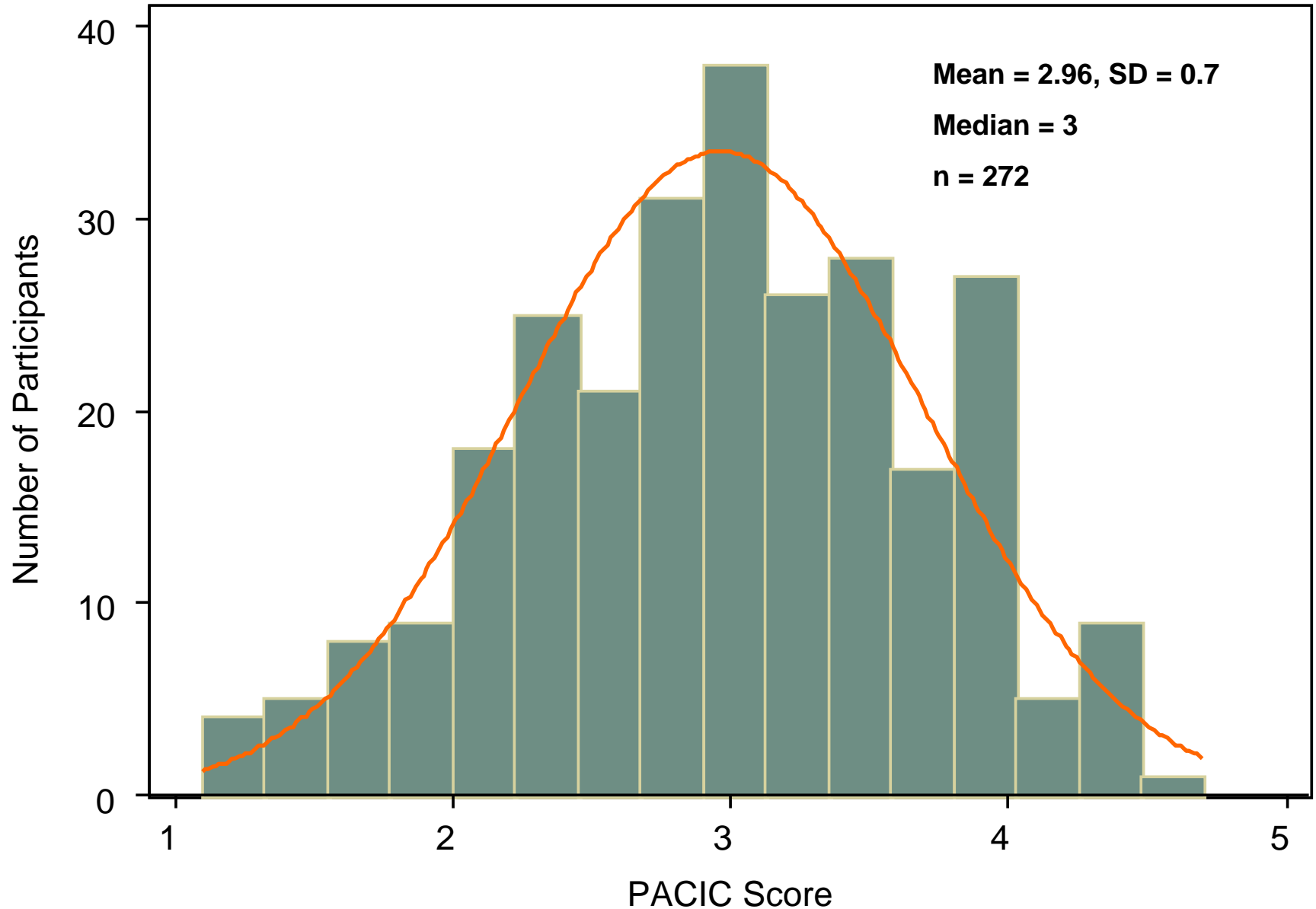
Over the past 6 months, when I received care for my chronic illness, I was:

	<u>Almost Never</u>	<u>Generally Not</u>	<u>Sometimes</u>	<u>Most of the Time</u>	<u>Almost Always</u>
12. Sure that my doctor or nurse thought about my values and my traditions when they recommended treatments to me.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
13. Helped to make a treatment plan that I could do in my daily life.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
14. Helped to plan ahead so I could take care of my illness even in hard times.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
15. Asked how my chronic illness affects my life.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
16. Contacted after a visit to see how things were going.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
17. Encouraged to attend programs in the community that could help me.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
18. Referred to a dietitian, health educator, or counselor.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
19. Told how my visits with other types of doctors, like the eye doctor or surgeon, helped my treatment.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
20. Asked how my visits with other doctors were going.	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>

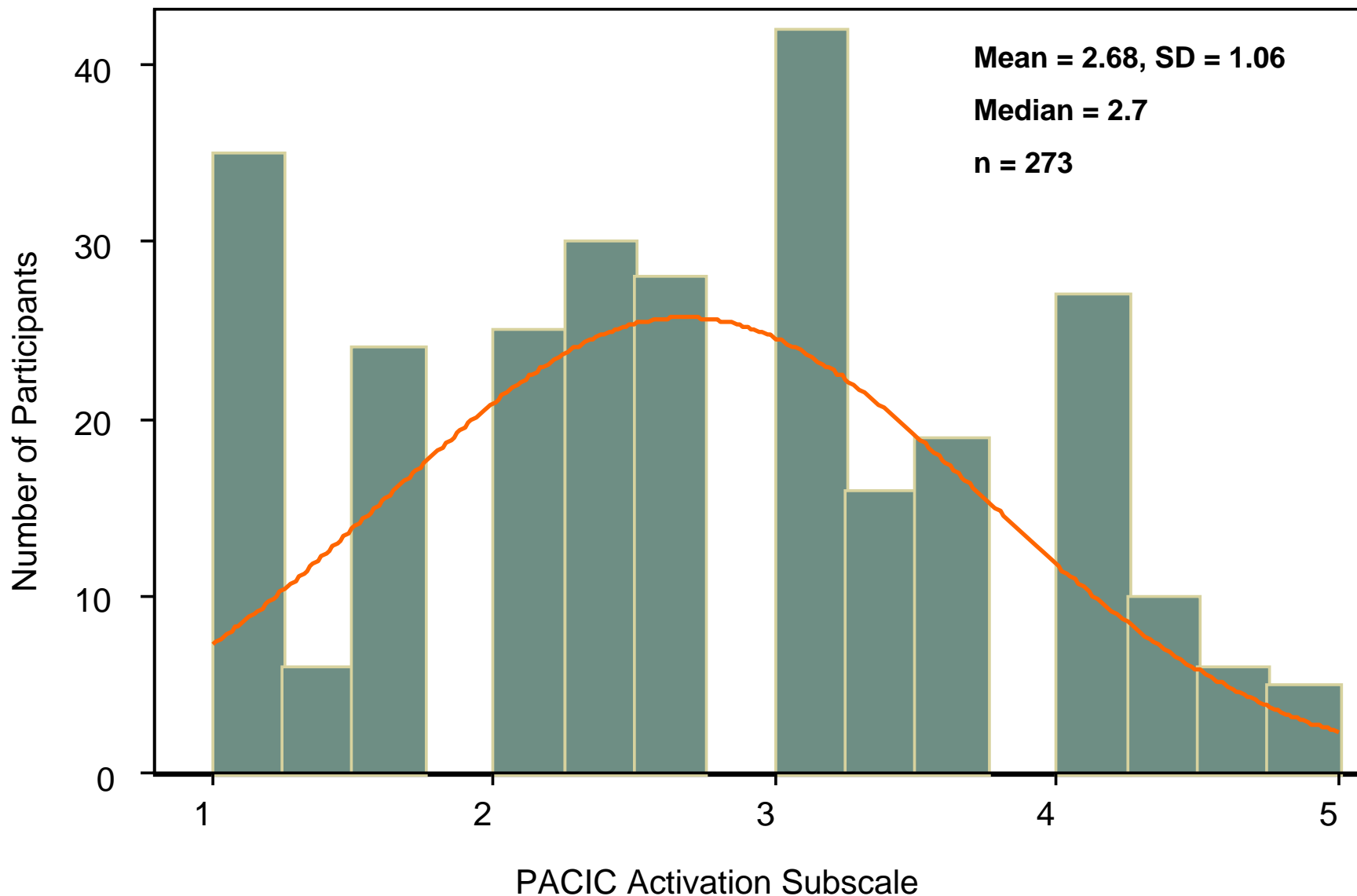
#### Scoring of PACIC Scales:

Patient Activation	Average of Items 1-3
Delivery System Design/Practice Design	Average of Items 4-6
Goal setting/Tailoring	Average of Items 7-11
Problem-Solving/Contextual	Average of Items 12-15
Follow-up/Coordination	Average of Items 16-20

# Patient Assessment of Chronic Illness Care (PACIC) Scores

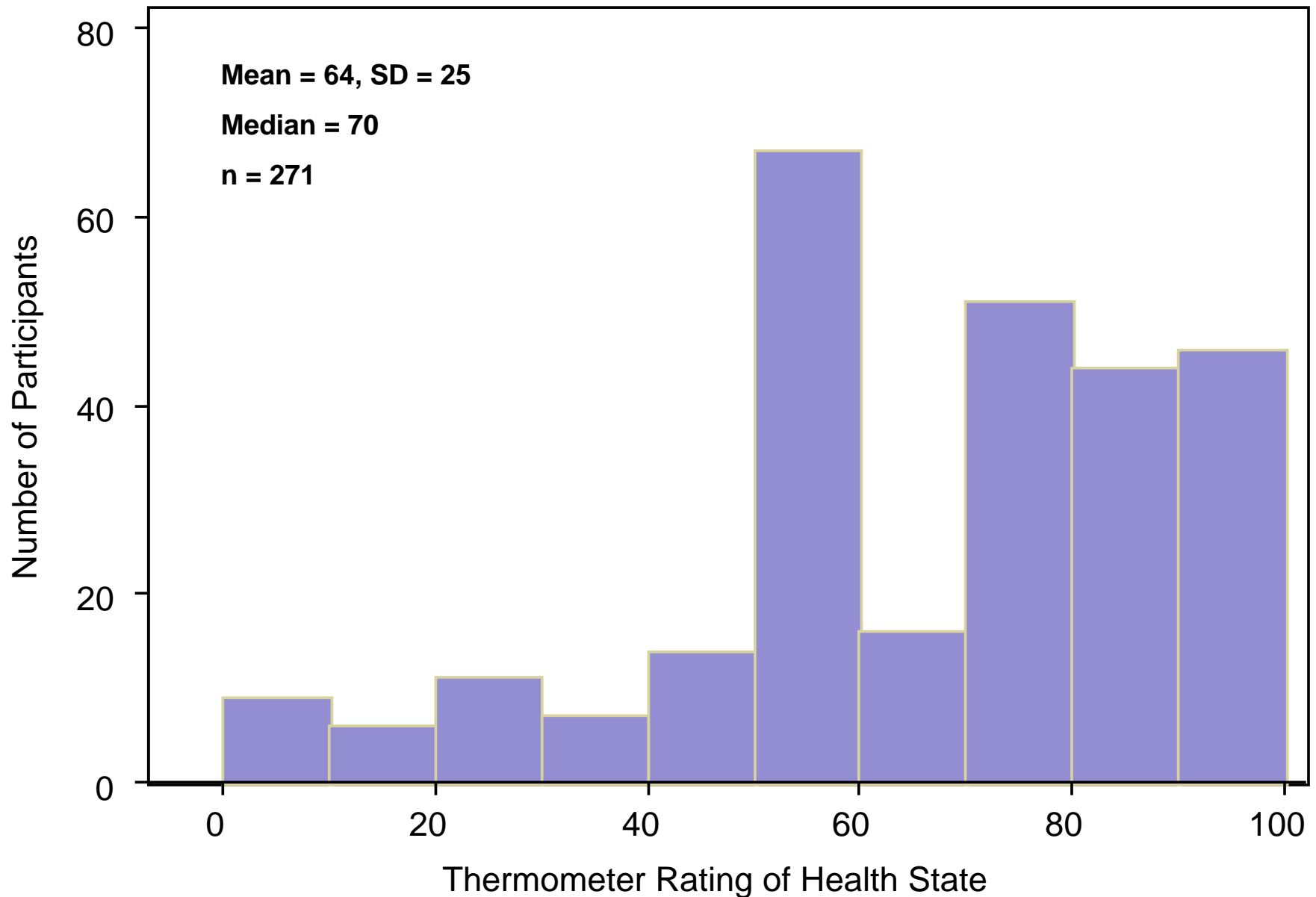


# PACIC Activation Subscale Scores





# Self-Rated Health State (Thermometer Rating)

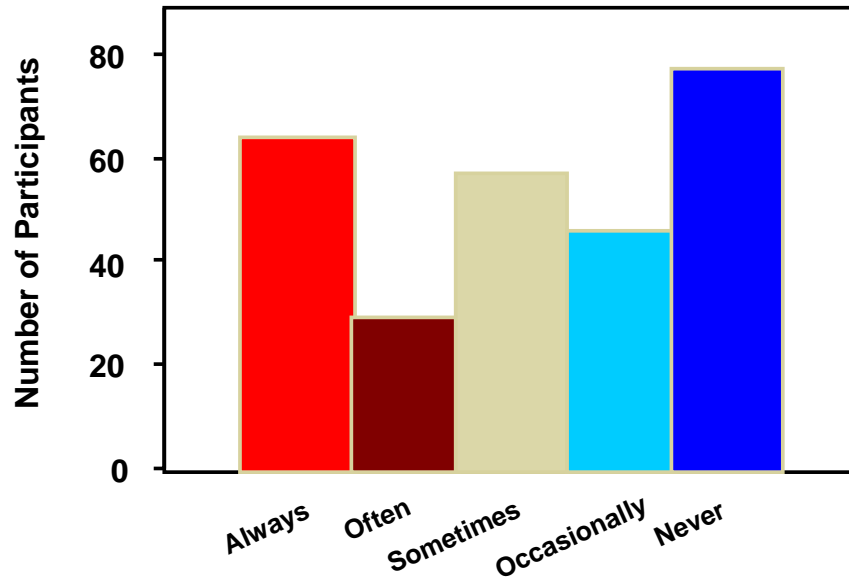


# Health Literacy Questions

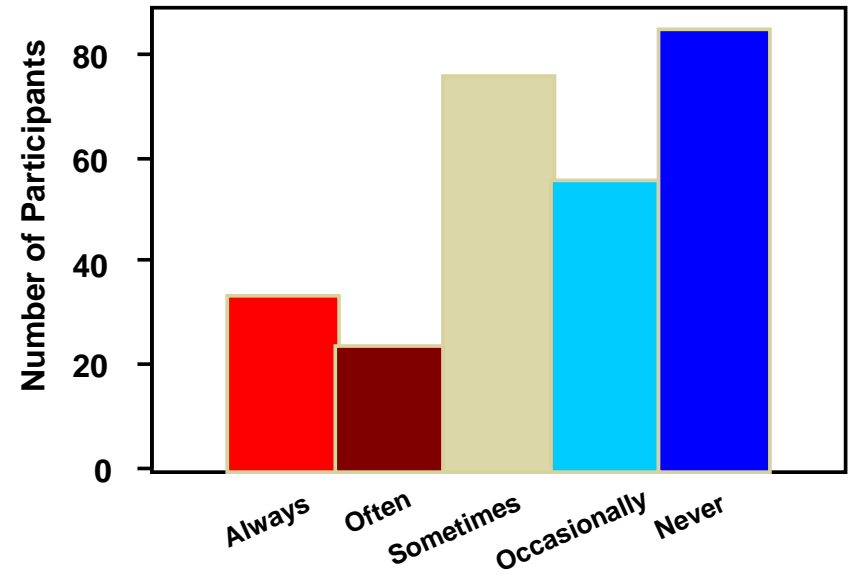
1. How often do you have someone help you read hospital materials?
2. How often do you have problems learning about your medical condition because of difficulty understanding written information?
3. How confident are you filling out medical forms by yourself?

\*Chew et al: Fam Med 2004;36(8):588-594.

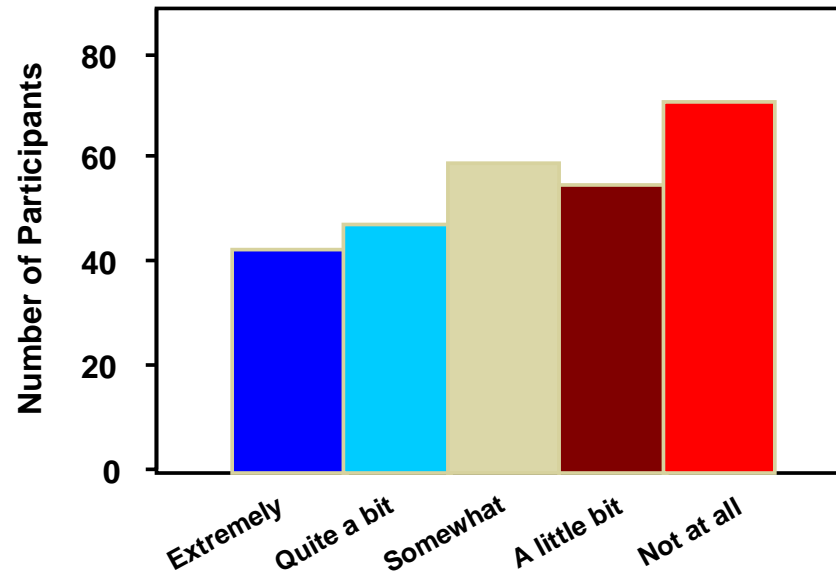
### Help reading hospital materials



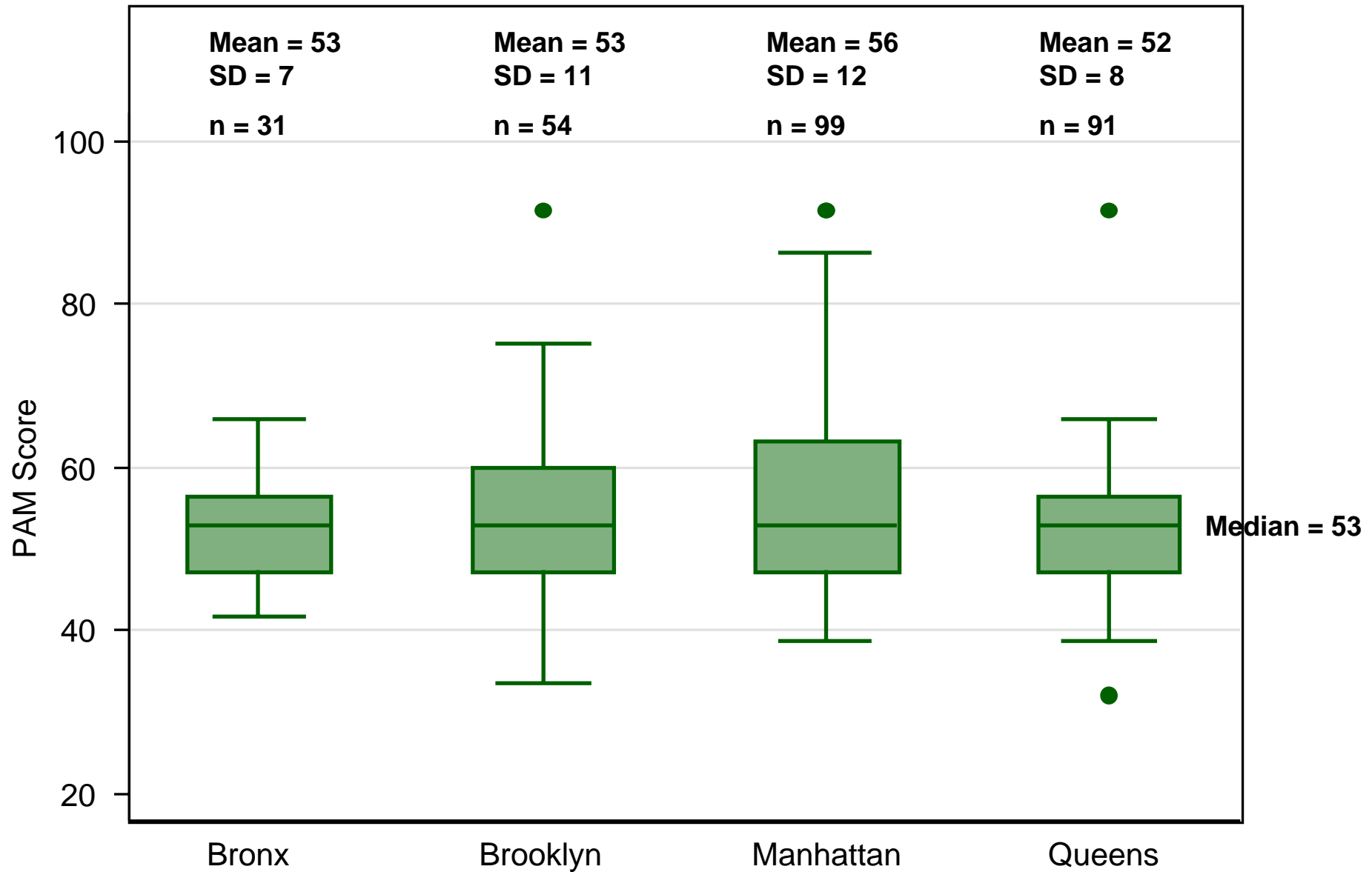
### Problems learning about their medical condition



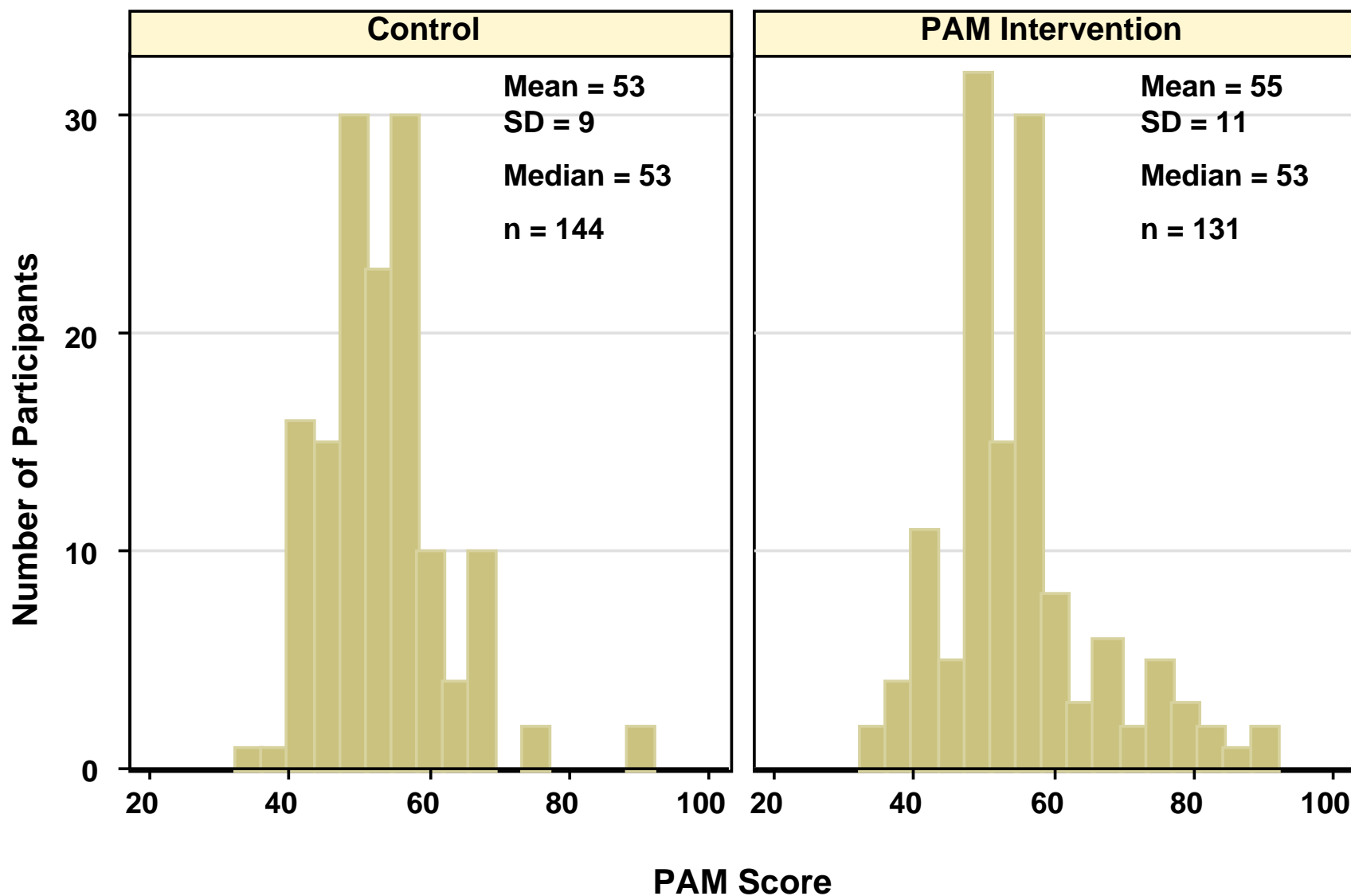
### Confident filling out medical forms



# PAM Scores by Borough



# PAM Scores by Randomization Group



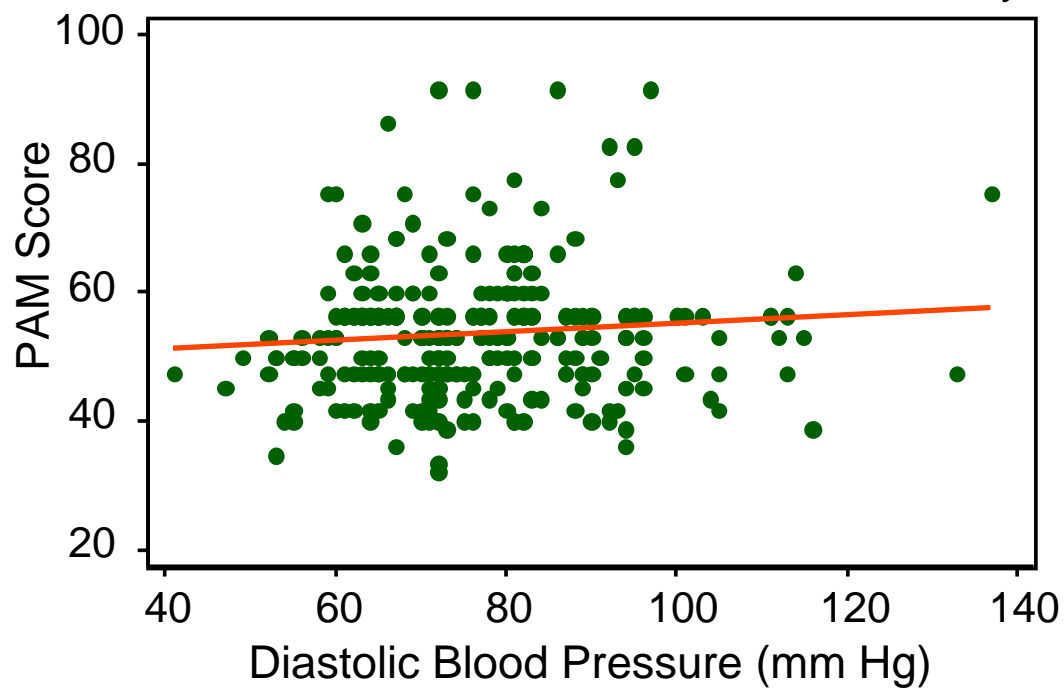
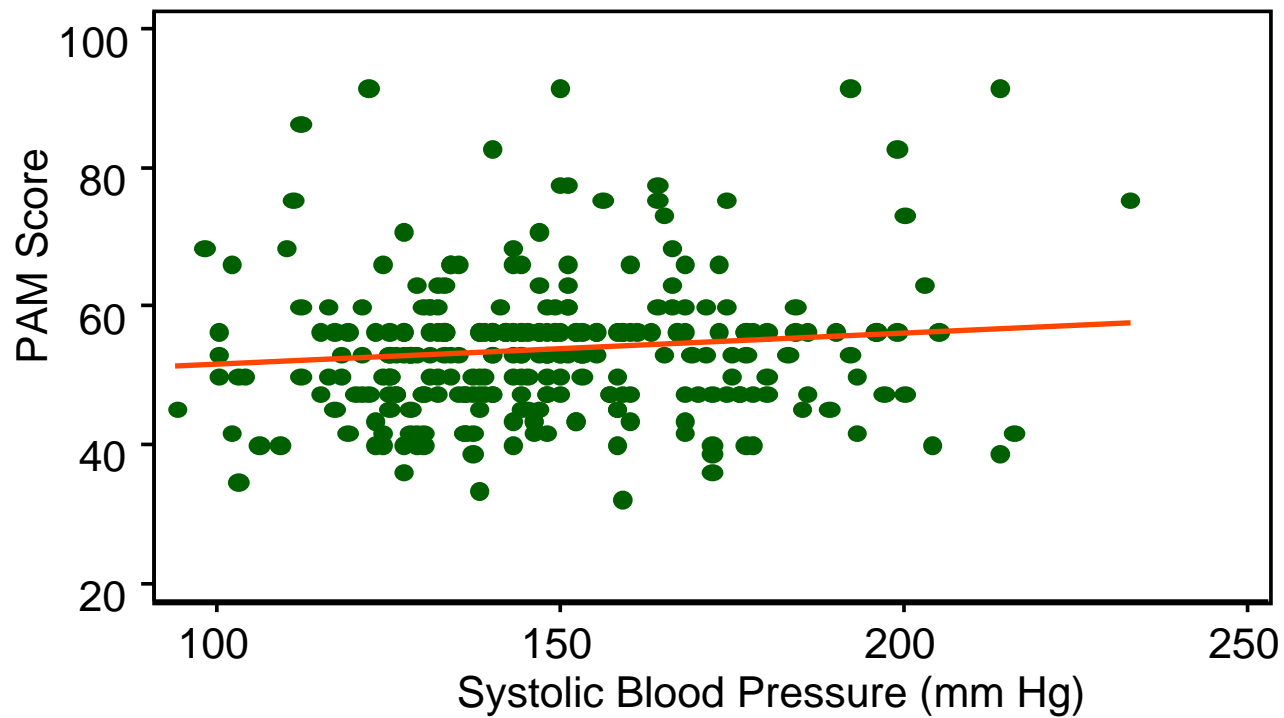


Table 1. Baseline comparison between participants in the study randomized to PAM intervention or usual care.

	<b>Total</b>	<b>Usual Care</b>	<b>PAM Intervention</b>	<b>p-value</b>
	<b>N = 275</b>	<b>N = 144</b>	<b>N = 131</b>	
Female Gender	229 (83%)	117 (81%)	112 (86%)	0.55
Age (years) Mean (SD)	80 (8)	80 (8)	79 (8)	0.18
Race	65 (24%)	44 (30%)	21 (16%)	< 0.001
White	164 (59%)	70 (49%)	94 (72%)	
Black	46 (17%)	30 (21%)	16 (12%)	
Other				
Marital Status	30 (11%)	16 (11%)	14 (11%)	0.99
Married	146 (54%)	77 (54%)	69 (53%)	
Widowed	96 (35%)	50 (35%)	46 (36%)	
Divorced, Separated, Never Married				
Lives Alone	170 (62%)	91 (64%)	79 (60%)	0.57
Borough	31 (11%)	11 (8%)	20 (15%)	< 0.001
Bronx	54 (20%)	18 (12%)	36 (27%)	
Brooklyn	99 (36%)	55 (38%)	44 (34%)	
Manhattan	91 (33%)	60 (42%)	31 (24%)	
Queens				
Time on VNS Choice (days) Mean (SD)	414 (326)	389 (304)	442 (348)	0.18

Table 1. Baseline comparison between participants in the study randomized to PAM intervention or usual care.

	<b>Total</b>	<b>Usual Care</b>	<b>PAM Intervention</b>	<b>p-value</b>
	<b>N = 275</b>	<b>N = 144</b>	<b>N = 131</b>	
Systolic Blood Pressure Mean (SD)	148 (25)	147 (24)	149 (26)	0.54
Diastolic Blood Pressure Mean (SD)	77 (15)	77 (15)	76 (15)	0.45
Diabetes and/or Renal Disease	129 (47%)	70 (50%)	59 (45%)	0.45
Number of Comorbidities Mean (SD)	2.4 (1.5)	2.5 (1.5)	2.3 (1.4)	0.16
Thermometer rating of health state (VAS-T) Mean (SD)	64 (24)	65 (23)	62 (26)	0.44
Self Rated Health				0.81
Excellent	9 (3%)	4 (3%)	5 (4%)	
Very Good	25 (9%)	15 (11%)	10 (8%)	
Good	88 (32%)	48 (33%)	40 (31%)	
Fair	112 (41%)	58 (40%)	54 (41%)	
Poor	41 (15%)	19 (13%)	22 (17%)	
Depression: Depression Sum $\geq 2$	135 (49%)	81 (57%)	54 (41%)	0.01
PAM Activation Score Mean (SD)	53.8 (10.3)	52.8 (9)	54.8 (11.4)	0.11
PACIC Score Mean (SD)	2.96 (0.73)	2.96 (0.75)	2.97 (0.71)	0.88



Table 1. Baseline comparison between participants in the study randomized to PAM intervention or usual care

	Total	Usual Care	PAM Intervention	p-value
	N = 275	N = 144	N = 131	
How often someone help read material (Health literacy 1)				
Always	64 (23%)	29 (20%)	35 (27%)	0.038
Often	29 (11%)	13 (9%)	16 (12%)	
Sometimes	57 (21%)	32 (23%)	25 (19%)	
Occasionally	46 (17%)	33 (23%)	13 (10%)	
Never	77 (28%)	36 (25%)	41 (32%)	
How often has problems learning about medical conditions (Health literacy 2)				
Always	33 (12%)	12 (8%)	21 (16%)	0.15
Often	24 (9%)	14 (10%)	10 (8%)	
Sometimes	76 (28%)	47 (33%)	29 (22%)	
Occasionally	56 (20%)	28 (19%)	28 (22%)	
Never	85 (31%)	43 (30%)	42 (32%)	
How confident filling medical forms (Health literacy 3)				
Extremely	42 (15%)	24 (17%)	19 (14%)	0.37
Quite a bit	47 (17%)	24 (17%)	23 (17%)	
Somewhat	59 (22%)	31 (22%)	30 (22%)	
A little bit	55 (20%)	34 (23%)	22 (16%)	
Not at all	71 (26%)	31 (21%)	40 (30%)	

Other variables examined and found not to be significantly different between two groups include education, PACIC activation score, Hill-Bone Adherence score, # medications, and # hypertension medications.

Table 2. Predictors of PAM Score accounting for clustering

	N (%)*	ICC	PAM Score (intercept for reference group) and Effect \$	p-value
	N = 275			
Randomization Group		0.026		
Usual care	144 (52%)		<b>52.94</b>	0.23
PAM Intervention	131 (48%)		<b>1.73</b>	
Gender		0.032		
Male	46 (17%)		<b>53.29</b>	0.71
Female	229 (83%)		<b>0.60</b>	
Age (per 10 year increase)	79 (8) 65 – 103	0.036	<b>-1.12</b>	0.14
Race		0.033		
White	65 (23%)		<b>-1.08</b>	0.58
Black	164 (60%)		<b>-0.03</b>	0.99
Other	46 (17%)		<b>54.08</b>	
Marital Status		0.036		
Married	30 (11%)		<b>0.58</b>	0.79
Widowed	146 (54%)		<b>-2.60</b>	0.06
Divorced, separated or never married	96 (35%)		<b>55.25</b>	
Borough		0.008		
Bronx	31 (11%)		<b>0.79</b>	0.72
Brooklyn	54 (20%)		<b>1.74</b>	0.36
Manhattan	99 (36%)		<b>4.37</b>	0.01
Queens	91 (33%)		<b>51.77</b>	
LOS in VNS CHOICE (per 100 day increase)	414 (326) 20 – 1093	0.044	<b>-0.4</b>	0.037
Lives Alone		0.028		
No	104 (38%)		<b>52.96</b>	0.27
Yes	170 (62%)		<b>1.41</b>	
HS graduate or higher		0.038		
No	141 (52%)		<b>-2.16</b>	0.083
Yes	132 (48%)		<b>54.92</b>	

Table 2. Predictors of PAM Score accounting for clustering

	N (%)*	ICC	PAM Score (intercept for reference group) and Effect <sup>\$</sup>	p-value
Systolic Blood Pressure (per 10 mm Hg)	148 (25) 94 – 233	0.032	<b>0.45</b>	0.07
Diastolic Blood Pressure (per 10 mm Hg)	77 (15) 41 – 137	0.032	<b>0.65</b>	0.12
Controlled BP (both) (<140/90, < 130/80 diabetes and kidney) No Yes	183 (67%) 89 (33%)	0.033	<b>54.61</b> <b>-2.61</b>	0.049
Diabetes or Renal Disease None Either or Both	143 (53%) 129 (47%)	0.032	<b>53.86</b> <b>-0.23</b>	0.85
Number of Comorbidities (per 1 extra comorbidity)	2.4 (1.5) 0 – 8	0.029	<b>-0.32</b>	0.45
Thermometer rating of health state (VAS-T) (per 10 point increase)	64 (25) 0 – 100	0.039	<b>0.7</b>	0.006
Depression: No Yes	139 (51%) 135 (49%)	0.023	<b>55.44</b> <b>-3.28</b>	0.008
Impaired Hearing: No Yes	190 (69%) 85 (31%)	0.029	<b>55.21</b> <b>-4.49</b>	0.001

Table 2. Predictors of PAM Score accounting for clustering

	N (%)*	ICC	PAM Score (intercept for reference group) and Effect <sup>§</sup>	p-value
How often someone help read material (Health literacy 1)		0.042		
Always	64 (23%)		<b>-3.66</b>	0.038
Often	29 (11%)		<b>-6.73</b>	0.003
Sometimes	57 (21%)		<b>-1.19</b>	0.501
Occasionally	46 (17%)		<b>0.43</b>	0.822
Never	77 (28%)		<b>55.57</b>	
How often has problems learning about medical conditions (Health literacy 2)		0.034		
Always	33 (12%)		<b>-1.58</b>	0.455
Often	24 (9%)		<b>-6.91</b>	0.005
Sometimes	76 (28%)		<b>-2.11</b>	0.191
Occasionally	56 (20%)		<b>-3.84</b>	0.032
Never	85 (31%)		<b>55.98</b>	
How confident filling medical forms (Health literacy 3)		0.032		
Extremely	42 (15%)		<b>5.16</b>	0.011
Quite a bit	47 (17%)		<b>2.41</b>	0.212
Somewhat	59 (22%)		<b>0.52</b>	0.770
A little bit	55 (20%)		<b>-1.18</b>	0.518
Not at all	71 (26%)		<b>52.70</b>	
PACIC Score (per 1 point increase)	2.96 (0.7) 1.1 – 4.7	0.037	<b>3.06</b>	<0.001
PACIC Act (per 1 point increase)	2.68 (1.1) 1 – 5	0.029	<b>0.75</b>	0.22

\* Except for continuous variables: Mean (SD) Min – Max

§ Change in means for categorical variables, slope for continuous variables

Other variables examined and found not to significantly predict PAM score include Hill-Bone Adherence score, # medications, and # hypertension medications.

Table 3 Multivariate model (adjusting for age, race and gender, none of which was significant).

	<b>PAM Score (intercept for reference group) and Effect \$</b>	<b>p-value</b>
N = 275		
<b><i>Intercept</i> **</b>	<b>47.66</b>	
LOS in VNS CHOICE (per 100 day increase)	<b>-0.45</b>	0.016
Thermometer rating of health state (VAS-T) (per 10 point increase)	<b>0.64</b>	0.011
Depression: Yes	<b>-2.68</b>	0.027
How often someone help read hospital materials (Health literacy 1)		
Always	<b>-5.05</b>	0.005
Often	<b>-7.49</b>	0.001
Sometimes	<b>-3.46</b>	0.048
Occasionally	<b>-1.72</b>	0.360
PACIC Score (per 1 point increase)	<b>3.22</b>	<0.001
Impaired hearing: Yes	<b>-2.93</b>	0.033

\*\* Reference group 65 year old woman of race = other, without depression, without hearing impairment, and who does not need help reading hospital materials.

# Summary of Results

- Baseline comparison between the Usual Care and PAM Intervention groups showed differences by race, borough of residence, depression score, and health literacy.
- The effect of clustering by team on PAM scores was small.
- Univariate predictors of PAM included length of stay in the CHOICE program, control of blood pressure, thermometer rating of health, depression score, measures of health literacy, and PACIC score.

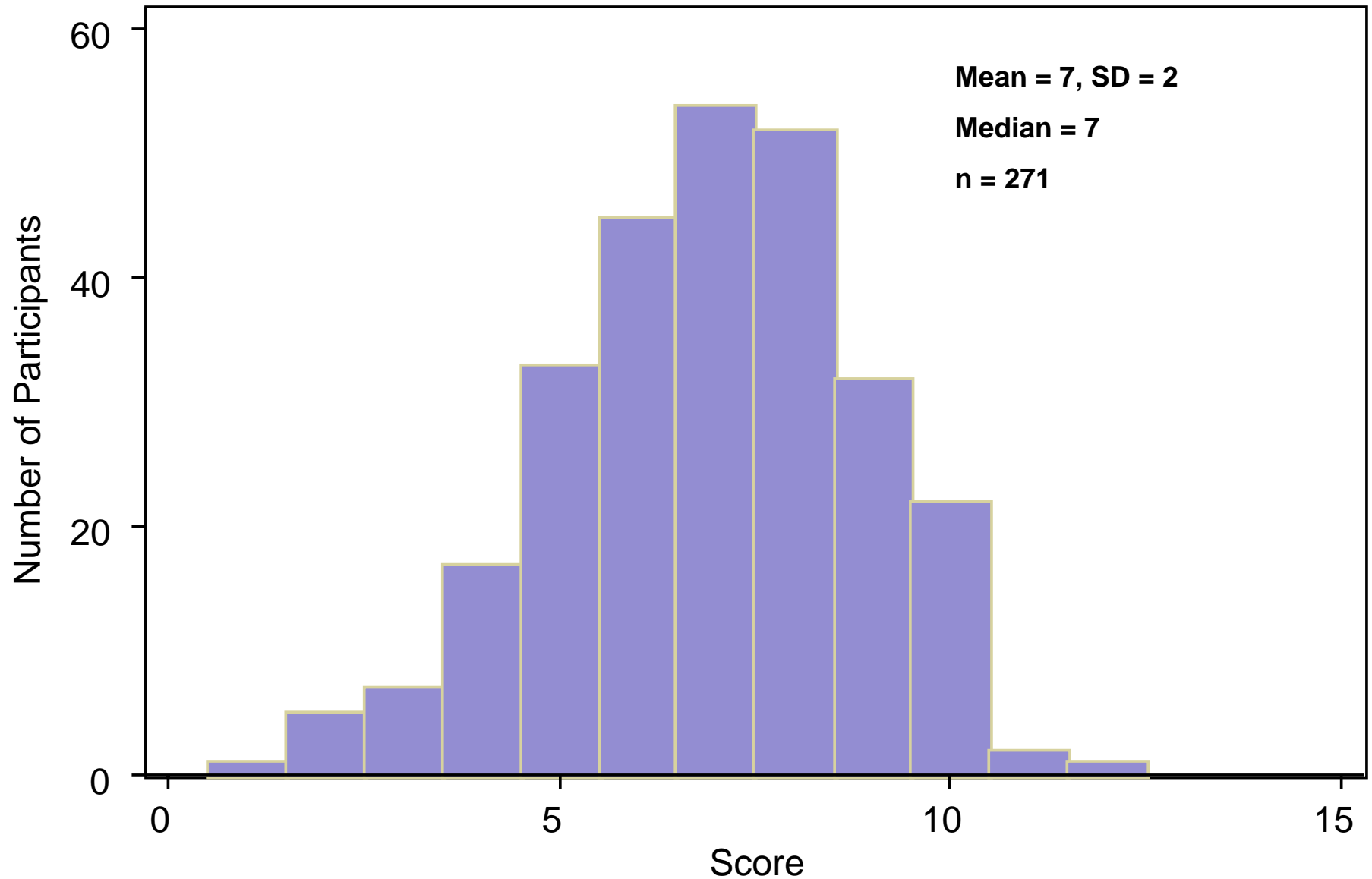
# Summary of Results

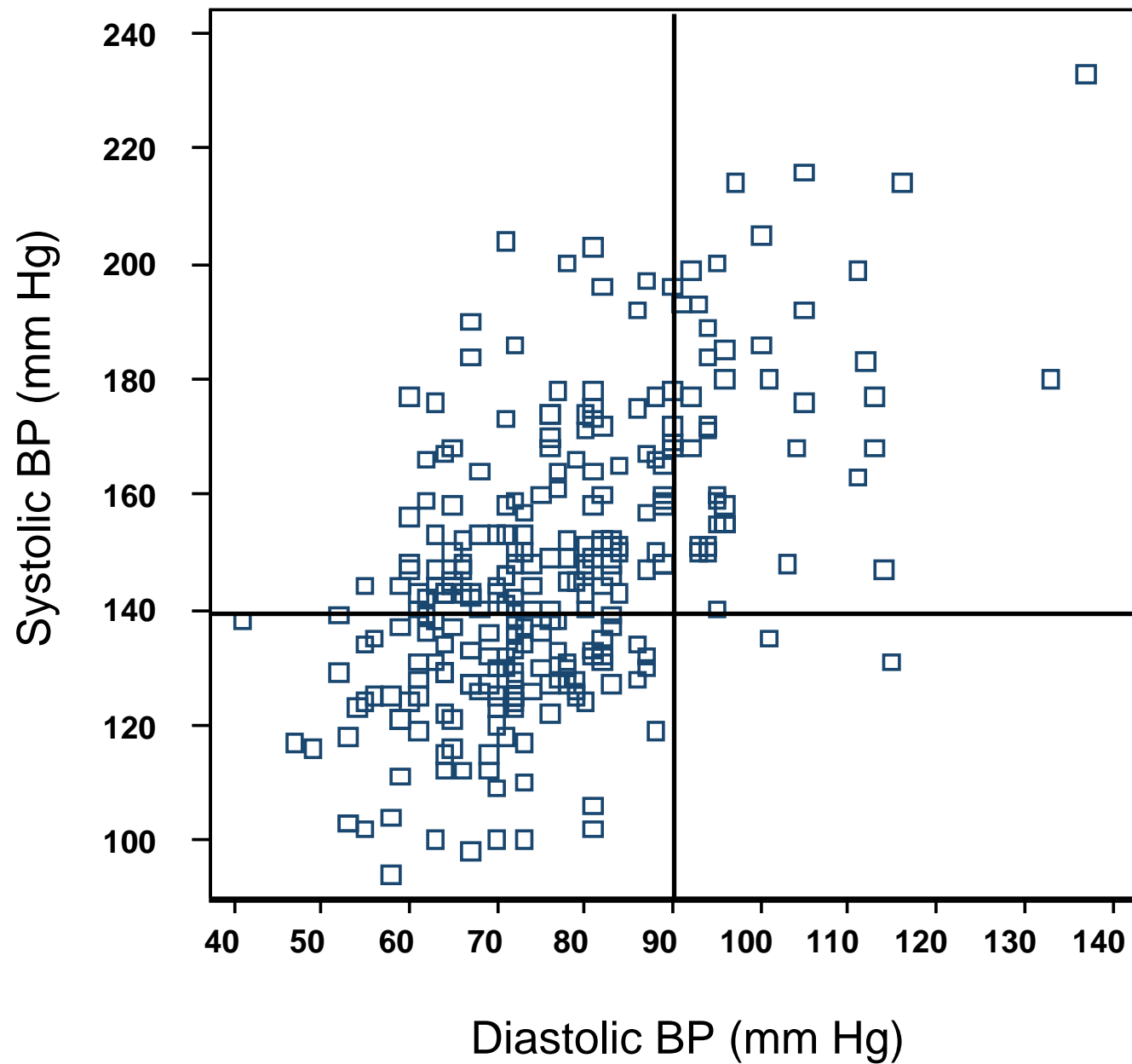
- In a multivariate model that adjusted for age, race, and gender, the six independent factors that predicted PAM score were:
  - Length of stay in VNS CHOICE
  - Thermometer rating of health state
  - Depression score
  - Health literacy
  - The Patient Assessment of Chronic Illness Care (PACIC) score
  - Impaired hearing

Thank You!



# ADL-IADL Summary Score





# Intra-Class Correlation (ICC)

- The intra-class correlation coefficient (ICC) is a statistical measure of the interdependence within each cluster and is calculated by taking the ratio of the variance between groups compared with variance within groups.

$$ICC = \frac{\sigma_c^2}{\sigma_c^2 + \sigma_r^2}$$

# Intervention Strategies for the Four PAM Patient Stages

**Stage 1:** Promote the belief that an active patient role is important

**Stage 2:** Support the building of confidence and knowledge necessary to take action

**Stage 3:** Encourage the patient to actually take action to maintain and improve one's health

**Stage 4:** Reinforce the importance of staying the course, even under stress

# Stage 1: Promote the belief that an active patient role is important

## **Raw Score 13-35 (PAM score 0-47)**

Patients in Stage 1 typically do not understand that they need to play a role in their own health. They likely do not have the basic knowledge about their condition, treatments options, or self-care.

**Goal:** Patients in Stage 1 need to understand that they hold the key to their future health and functioning. The goal is to come to understand that through their own actions they can have a positive impact on their health.

**Intervention:** Have patients think about how their actions impact their health. Encourage them to use a tool such as a food diary so they can start to self-monitor their behaviors.

## Stage 2: Support the building of confidence and knowledge necessary to take action

### **Raw Score 36-38 (PAM Score 47.1 – 55.1)**

Patients in stage 2 may lack basic knowledge about their condition, treatments options, and/or self-care. They likely have had little experience or success with behavior change. They feel less in charge of their own health and care.

**Goal:** Patients in Stage 2 need to have an adequate knowledge base for making good choices and they need to begin to build confidence that they can make small positive changes.

**Intervention:** Have the patient make a list of questions about what they do and do not understand about their treatment options and medications. Begin to work with the patient on creating an action plan with the initial goals being easily obtainable. Have patients make a list of what meds they are taking for high blood pressure.

## Stage 3: Encourage the patient to actually take action to maintain and improve one's health

### **Raw Score 39-42 (PAM score 55.2-67.0)**

Patients in Stage 3 likely have the basic facts of their conditions and treatments. They have had some experience and success in making behavioral changes. They have some confidence in handling limited aspects of their condition.

- **Goal:** Patients in Stage 3 can begin to build on their past successes to increase their confidence and ability in handling all aspects of their condition.

**Intervention:** Clinician should continue to work with patient on development of their action plan and relate it to their larger “quality of life” goals. The patient should assess their progress thus far – which situations has the patient handled well and which situations have been difficult?

## Stage 4: Reinforce the importance of staying the course, even under stress

### **Raw Score 43-52 (PAM score 67.1-100)**

Patients in Stage 4 have made most of the necessary behavioral changes, but may have difficulty maintaining behaviors over time or during stress.

**Goal:** Patients in Stage 4 should focus on increasing their confidence and skills for maintaining behaviors and coping under stress.

**Intervention:** Identify stressful situations and work with patients on problem solving exercises to maintain lifestyle changes.



	<b>Total</b>	<b>Usual Care</b>	<b>PAM Intervention</b>	<b>p- value</b>
PAM Stage				0.006
1	56 (21%)	33 (23%)	23 (18%)	
2	75 (27%)	35 (24%)	40 (30%)	
3	121 (44%)	71 (49%)	50 (38%)	
4	23 (8%)	5 (4%)	18 (14%)	