



A National Web Conference on the Innovative Use of Technology to Enable Behavioral Changes in Hard-to-Reach Patients

September 13, 2012



Moderator and Presenters Disclosures

Moderator:

Dina Moss, MA

Agency for Healthcare Research and Quality

Presenters:

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Jennifer Uhrig, PhD

Helaine Resnick, PhD, MPH

There are no financial, personal, or professional conflicts of interest to disclose for the speakers or myself.



Background and Context

Broad IT trends with potential for dramatic impact on care delivery and patient engagement

- expansion and increased sophistication of telephone-based services to include data and video
- development of extensive, web-based social networking technologies

Transformational potential of these technologies arising from decreasing costs and increasing availability, resulting in

- truly individual connectivity
- near universality of geographic reach
- affordability





Background and Context (2)

AHRQ GOALS -- Test proof-of-concept projects that make innovative use of communication-based technologies to

- engage hard to reach populations
- engage individuals directly in mgmt of their own health
- address ambulatory care issues

Three Funded ACTION Projects:

- Each uses a unique IT-based technology
- Each engages a different hard-to-reach population





Overview

“Reaching Women Through Health Information Technology”

Brian Jack, MD, Timothy Bickmore, PhD

Adaptation of a clinical patient education system to deliver a behavior change intervention for young African-American women

“Tailored Text-Messages to Promote Knowledge, Prevention, Social Support and Medication Adherence for People Living with HIV” -- Jennifer Uhrig, PhD

Implementation of a short message service (SMS)-based intervention providing tailored health-communication messages for HIV-positive men

“Technologies for Enhancing Access to health Management”

Use of tele-health kiosks to aid older adults in managing hypertension and other chronic conditions -- **Helaine Resnick, PhD, MPH**





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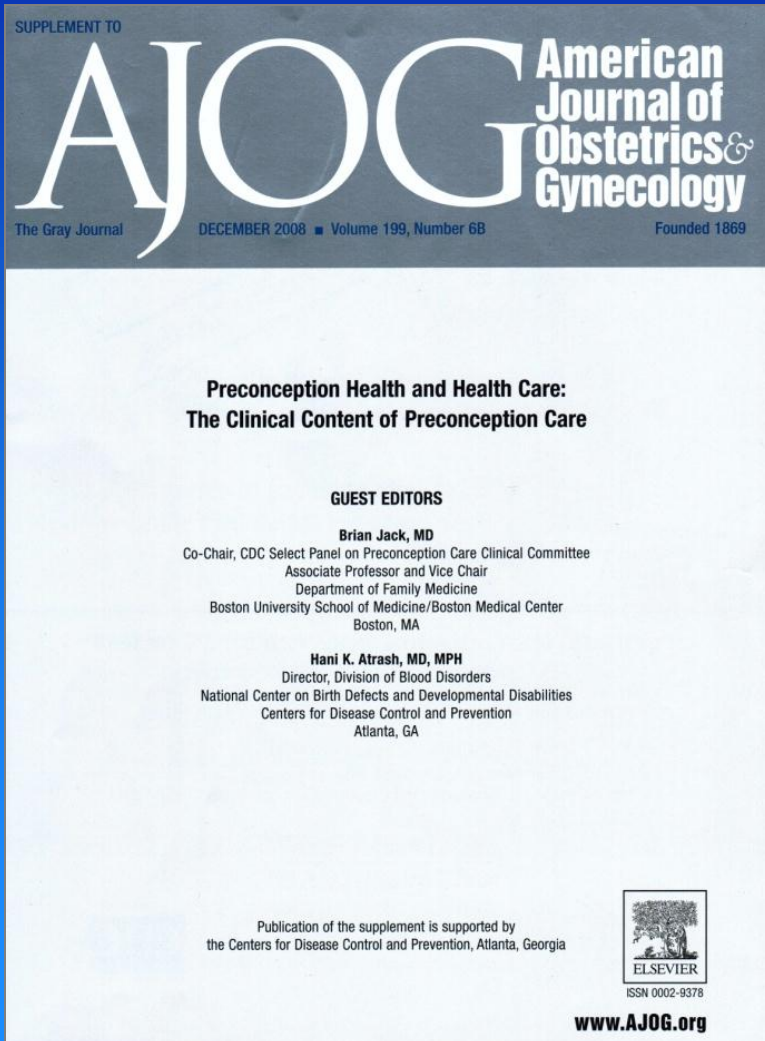
Reaching Women Through Health Information Technology *The Gabby Preconception Care System*

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The Clinical Content of Preconception Care



A series of 14 papers by the Clinical Workgroup of the CDC Select Panel on Preconception Care

Guest Editors:

Brian W. Jack MD and
Hani Atrash MD, MPH

American Journal of Obstetrics and Gynecology

Volume 199, Issue 6, Supplement 2,
December 2008

<http://www.beforeandbeyond.org>



Components of PCC

Category	Components of Preconception Care
Family planning	Physical Activity, Weight Status, Nutrient Intake, Folate, Immunizations, Substance Use, Sexually Transmitted Infections, Human Papillomavirus (HPV), Hepatitis B, Varicella, Measles/Mumps/Rubella, Influenza, Diphtheria/Tetanus/Pertussis (DTaP)
Infectious diseases	HIV, Hepatitis C, Tuberculosis, Toxoplasmosis, CMV, Listeriosis, Parvovirus, Malaria, Gonorrhea, Chlamydia, Syphilis, History of Genital Herpes, Asymptomatic bacteruria Periodontal disease, Bacterial Vaginosis, Group B Strep
Medical conditions	Diabetes, Thyroid Disease, PKU, Seizures, Hypertension, Rheumatoid Arthritis, Lupus, Renal Disease, Cardiovascular, Thrombophilia, Asthma
Psychiatric	Depression/Anxiety, Bipolar disease, Schizophrenia
Parental Exposures	Alcohol, Tobacco, Illicit Substances
Family History	All Individuals, Ethnicity-based, Family history, Personal history
Nutrition	Dietary Supplements, Vitamin A, Folic Acid, Multivitamins, Vitamin D, Calcium, Iron, Essential Fatty Acids, Iodine, Underweight, Overweight, Eating Disorders
Environment	Mercury, Lead, Soil and Water Hazards, Workplace Exposure, Household Exposure
Psychosocial Risks	Inadequate Financial Resources, Access to Care, Physical / Sexual Abuse
Medications	Prescription, Over-the-counter, Medication, Dietary Supplements
Reproductive	Prior Preterm Birth Infant, Prior C-Section, Prior Miscarriage(s), Prior Stillbirth, Uterine Anomalies
Special Populations	Women with Disabilities, Immigrant and Refugee Populations, Cancer

Jack BW, Atrash H, Coonrod DV, Moos MK, O'Donnell J, Johnson K. The clinical content of preconception care: an overview and preparation of this supplement. *AJOG*. 2008; Vol 199, Issue 6, Supplement B: S266-S279.



**Is it possible for busy clinicians
to deliver this care?**

Can health IT help?

Using Health IT to Overcome Challenge of Clinician Time

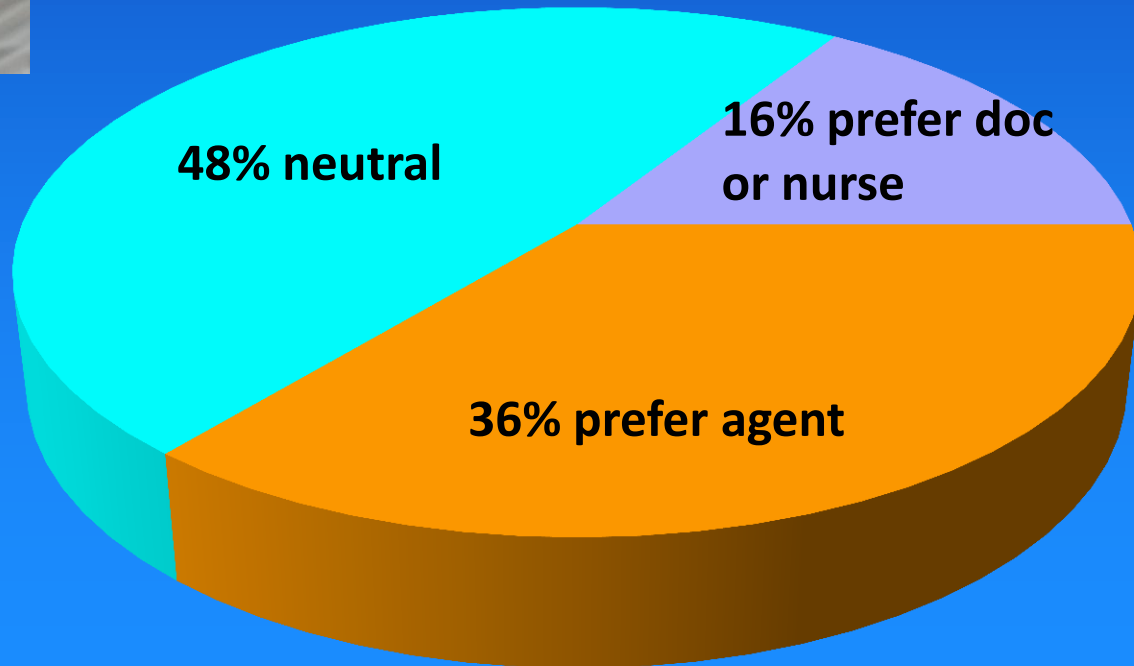
- “Embodied Conversational Agent” as health educator
- Emulate face-to-face communication
 - Hand gesture
 - Gaze
 - Head nod
 - Facial display
 - Body posture
 - Eyebrows
 - Prosody



Usable by Patients with Wide Range of Health & Computer Literacy

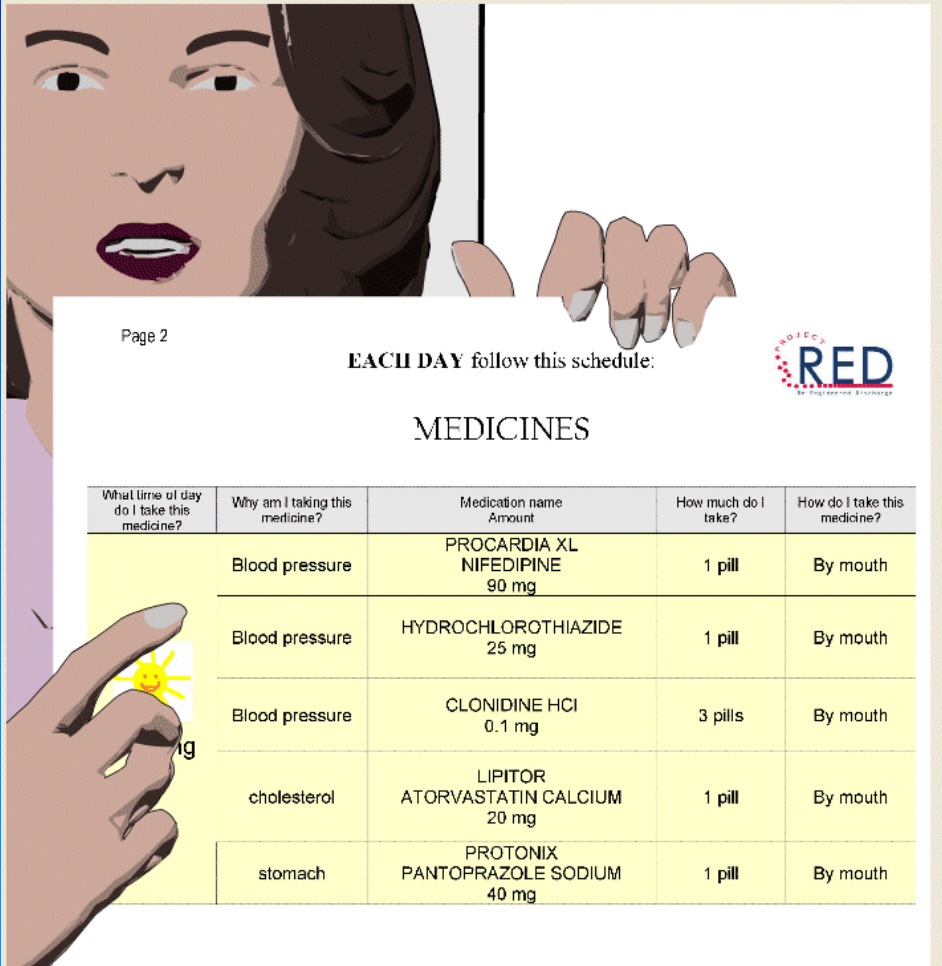


“Who would you rather receive discharge instructions from?”




Bickmore TW, Jack B, et al. *Journal of Health Communication* 2010;15:197-210

Emulates Best Practices in Health Communication

Page 2

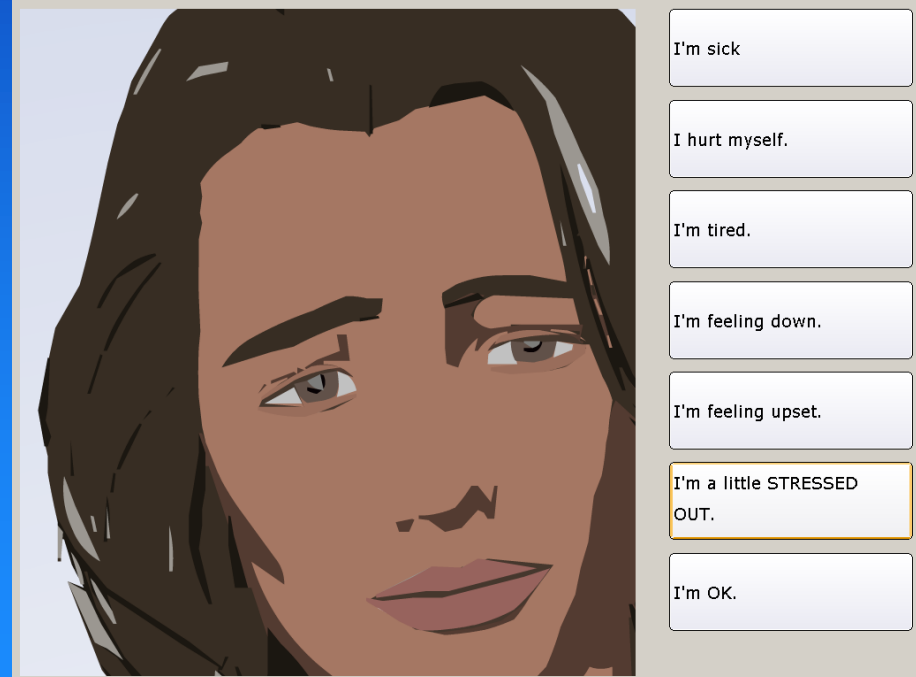
EACH DAY follow this schedule:



MEDICINES

What time of day do I take this medicine?	Why am I taking this medicine?	Medication name Amount	How much do I take?	How do I take this medicine?
	Blood pressure	PROCARDIA XL NIFEDIPINE 90 mg	1 pill	By mouth
	Blood pressure	HYDROCHLOROTHIAZIDE 25 mg	1 pill	By mouth
	Blood pressure	CLONIDINE HCl 0.1 mg	3 pills	By mouth
	cholesterol	LIPITOR ATORVASTATIN CALCIUM 20 mg	1 pill	By mouth
	stomach	PROTONIX PANTOPRAZOLE SODIUM 40 mg	1 pill	By mouth

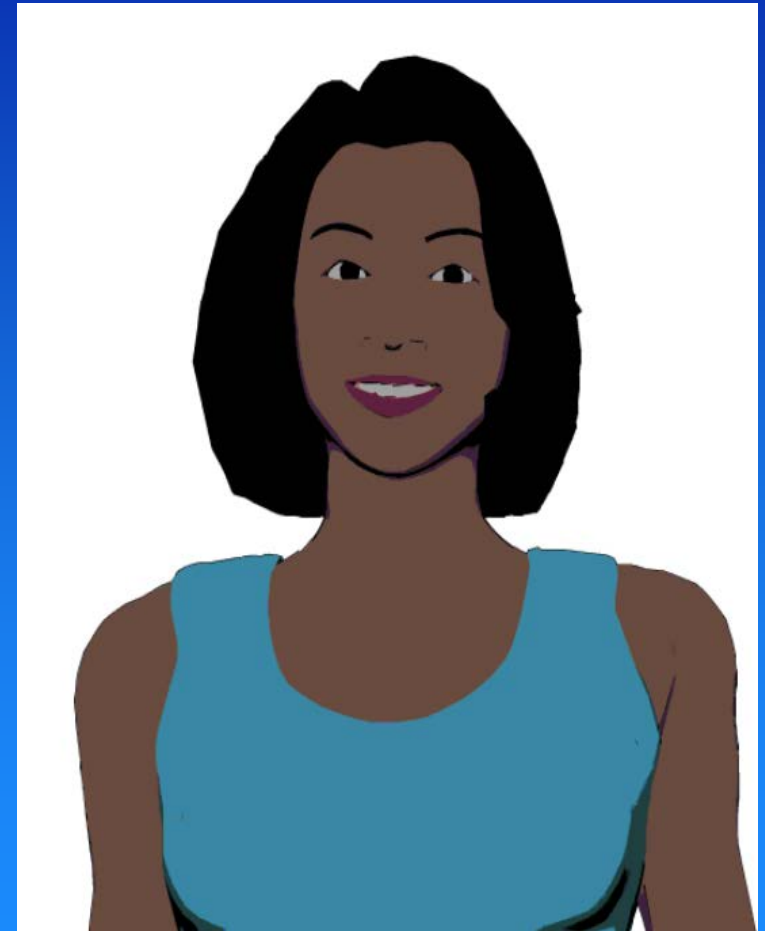
Agent Can Establish Therapeutic Alliance Over Time





Gabby Version 1: PCC System for Young African American Women

- Assess >100 Risks, 12 Domains
- Provides information: What is it? Why does it matter to me? Why does it matter for pregnancy?
- Assess readiness for change
- Creates “My Health To-Do List”
- Can print MHTDL for clinician appointment
- Provides “stories” for each risk
- Users can author stories for others



Focus Groups to Guide Development

8 focus groups conducted with 31 African American females, ages 15-21



- Suggestions for design of system
 - Appearance:
 - Clothing
 - Shading
 - Accessories
 - Hairstyle
 - Name
 - Script content
 - Stories
 - Social networking
 - Visual Layout



How Gabby Version 1 Works

Firefox Sex and Reproductive Health
wonder.ccs.neu.edu/PCC2Testing/Intake.php?D=3

Sex and Reproductive Health

1. Have you ever had sex, like vaginal intercourse, oral sex, or anal sex?
 Yes
 No
2. Do you use birth control on a regular basis?
 Yes
 No
- 2a. Check all the types that you use now.

<input type="checkbox"/> Birth control pills	<input type="checkbox"/> IUD
<input type="checkbox"/> Birth control patch	<input type="checkbox"/> Abstinence
<input type="checkbox"/> Birth control ring	<input type="checkbox"/> Implant
<input type="checkbox"/> Birth control shot	<input type="checkbox"/> Vasectomy
<input type="checkbox"/> Male Condom	<input type="checkbox"/> Spermicide
<input type="checkbox"/> Female Condom	<input type="checkbox"/> Morning after pill
<input type="checkbox"/> Withdrawal	<input type="checkbox"/> Rhythm/natural family planning
<input type="checkbox"/> Diaphragm	<input type="checkbox"/> Other
<input type="checkbox"/> Tubes tied	
3. Do you want to have a baby in the next year?
 Yes
 No
 Don't Know
4. Have you ever been pregnant?
 Yes
 No
- 4a. How many times have you been pregnant? This includes all miscarriages and abortions.
- 4b. How many live births have you had?
- 4c. How many stillbirths have you had? This is when a baby dies in the womb after the 20th week of pregnancy.
- 4d. How many miscarriages have you had?
- 4e. How many times have you had a miscarriage after 14 weeks of pregnancy?

Take PCC Risk Assessment

- 12 domains, total of 107 risks
- Identify baseline stage of change before each risk is discussed

“My Health To-Do List”

My Health To-Do List

Things I'm working on

Make an appointment with Dr. Smith

Add one more serving of fruit and veggies to your diet each day

Take your birth control pill every day

You can decide.

I don't want to talk.

Things to discuss

Talk about stress with Gabby

Things I've done

~~Choose a primary care physician~~





“My Health To-Do List”



Gabby Version 2

- Extends system with in-depth, stage-based, longitudinal health behavior change counseling.
- Motivational Interviewing for PreContemplation.
- Shared decision making, goal setting, problem solving for Contemplation, Preparation, Action.



Shared Decision Making for Family Planning



Version 1 Testing

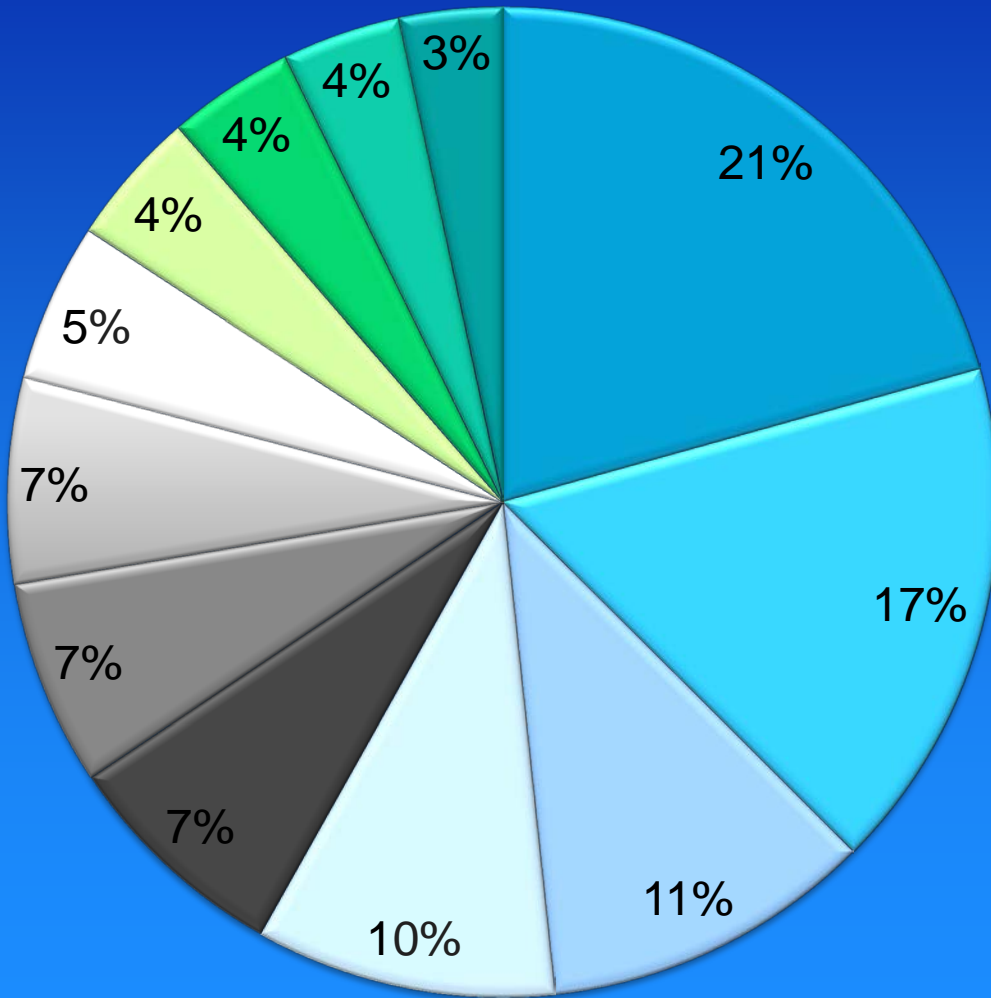
Usability Testing:











- 15 women recruited from the community
- Individual 2 hour session to: take risk assessment; hear about 6 risks; use story-authoring function, MHTDL; one-on-one interview

Pilot Testing:

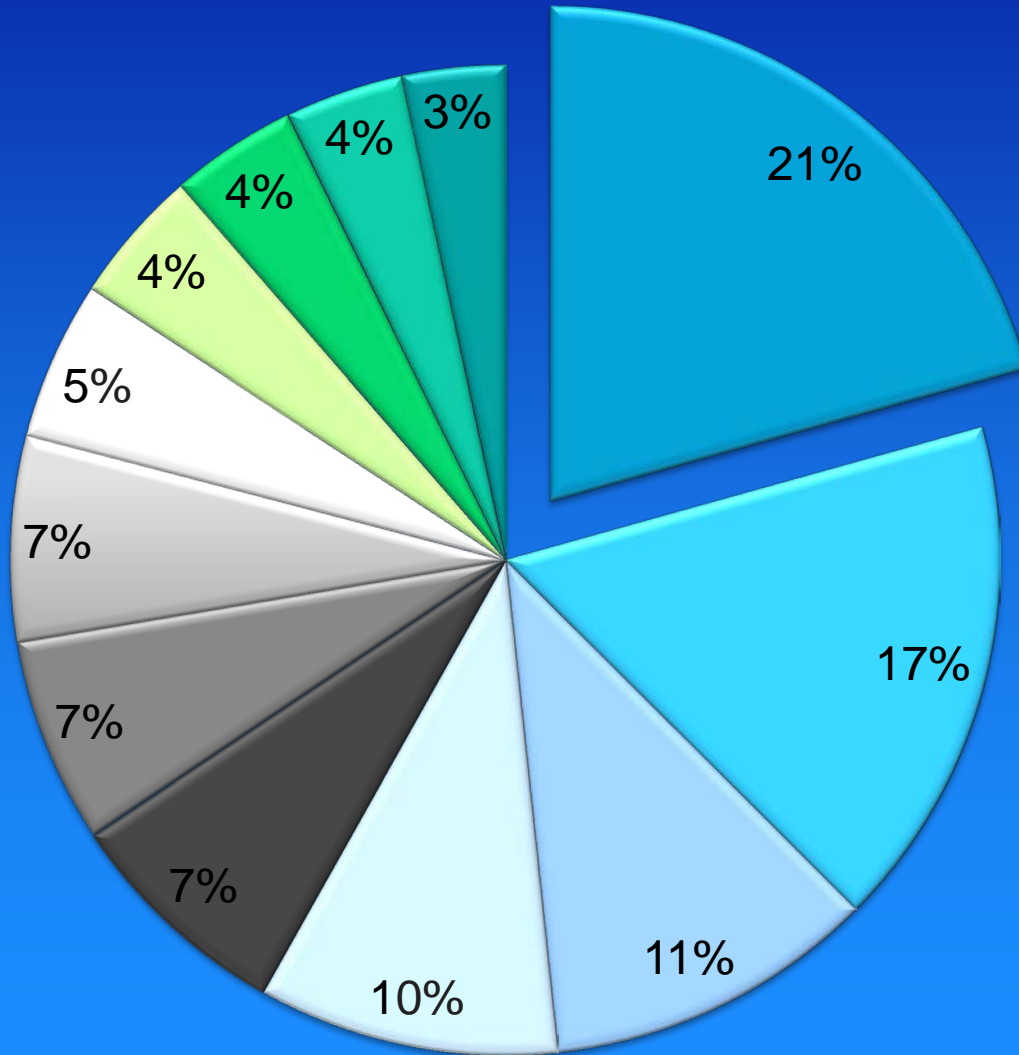
- 9 students from OMH “Preconception Peer Educator” program
- Participants used system for 2 months
- Follow-up phone call for outcome data

Results Risk Assessment: Risks by Domain



-  Nutrition
-  Infectious
-  Genetic
-  Environmental
-  Reproductive
-  Immunization
-  Health Conditions/ Meds
-  Healthcare/ Programs
-  Emotional
-  Substance
-  Men
-  Relationships

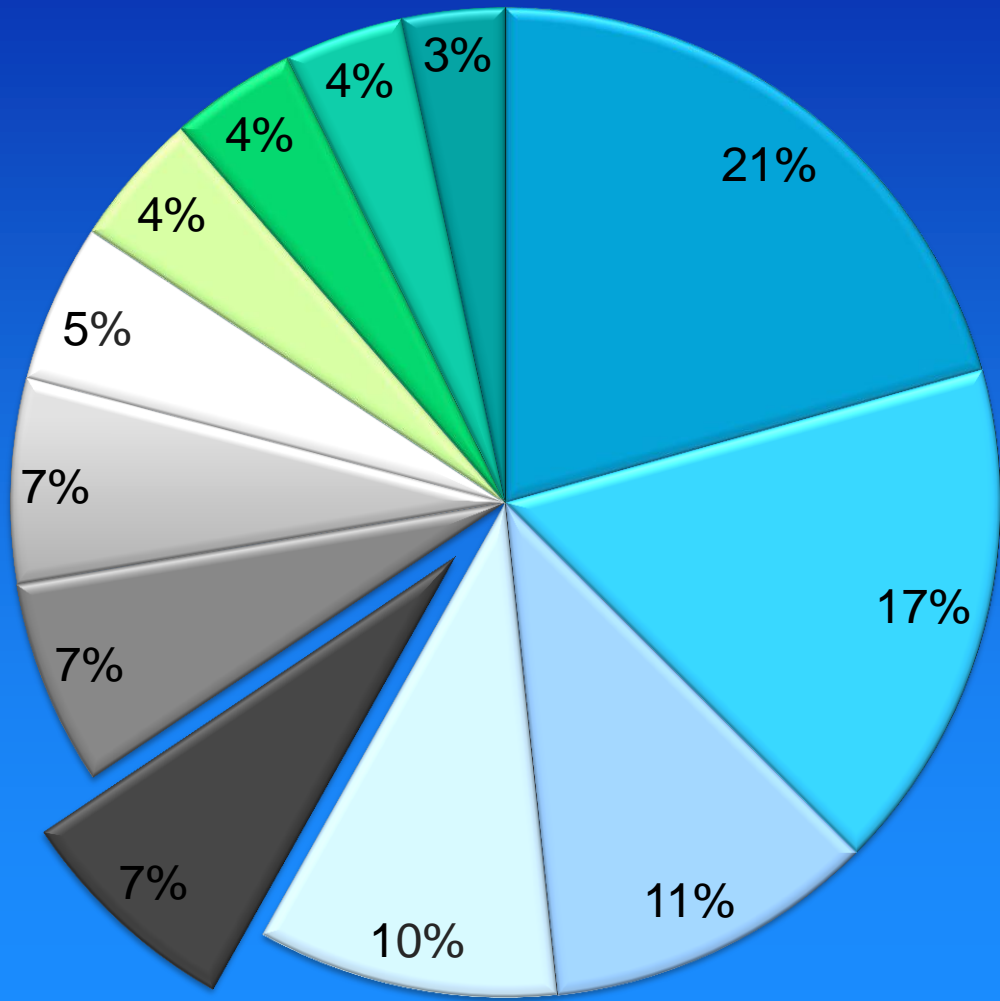
Results Risk Assessment: Risks by Domain



Nutrition:

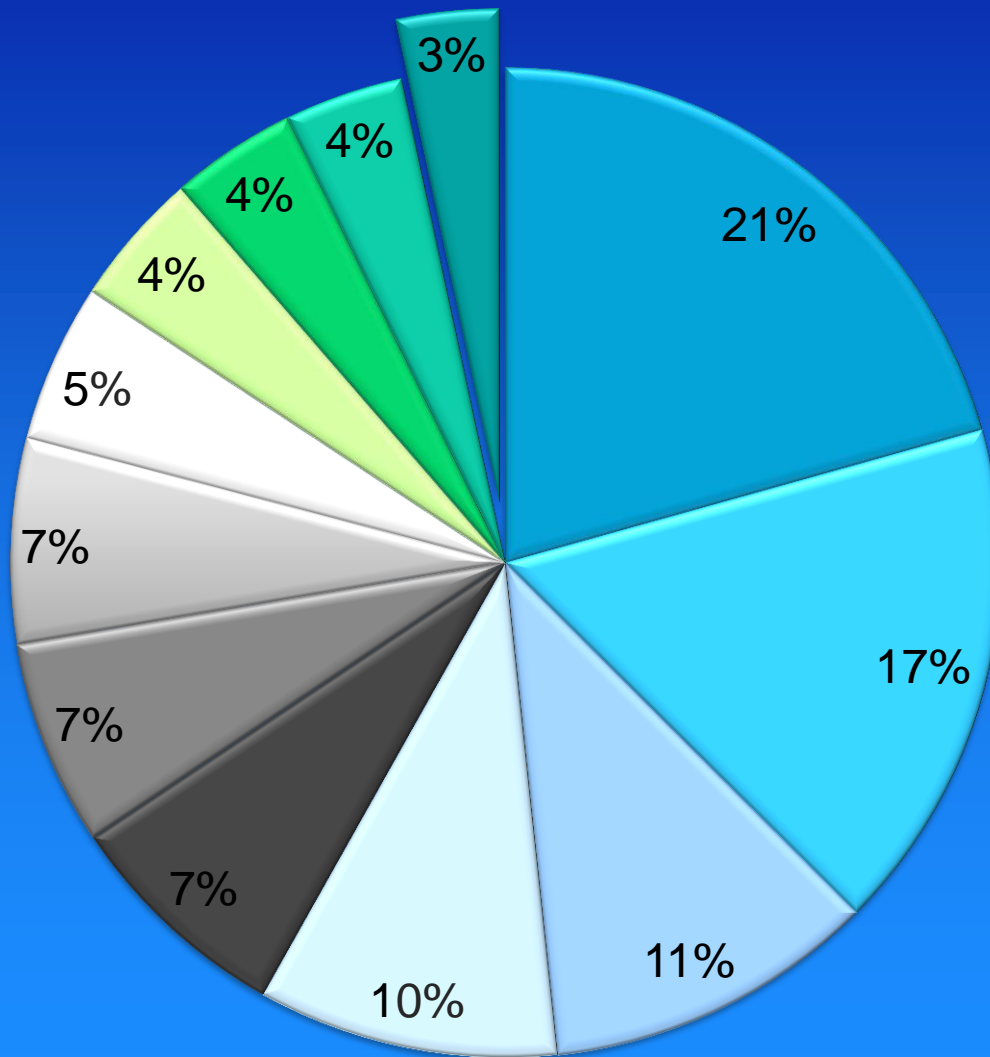
- Dietary Supplements (herbs and weight loss supplements)
- Vitamin A
- Folic Acid and/or Multivitamins
- Vitamin D
- Calcium
- Iron
- Essential Fatty Acids
- Underweight
- Overweight
- Eating Disorders
- Physical Activity
- “Healthy Eating” behaviors
- Caffeine

Results Risk Assessment: Risks by Domain



- Sex & Reproductive Health:**
- No method of birth control
 - Unreliable birth control
 - Prior Preterm Birth Infant
 - Prior C-Section
 - Prior Miscarriage(s) – 1 or 2
 - Prior Miscarriages – 3 or 4
 - Two or more miscarriages in 3rd trimester
 - Prior Abortion
 - Prior Stillbirth
 - Prior Infant or Child death
 - Uterine Anomalies
 - Vaginal Bleeding
 - User born LBW
 - Mother (of user) born LBW

Results Risk Assessment: Risks by Domain



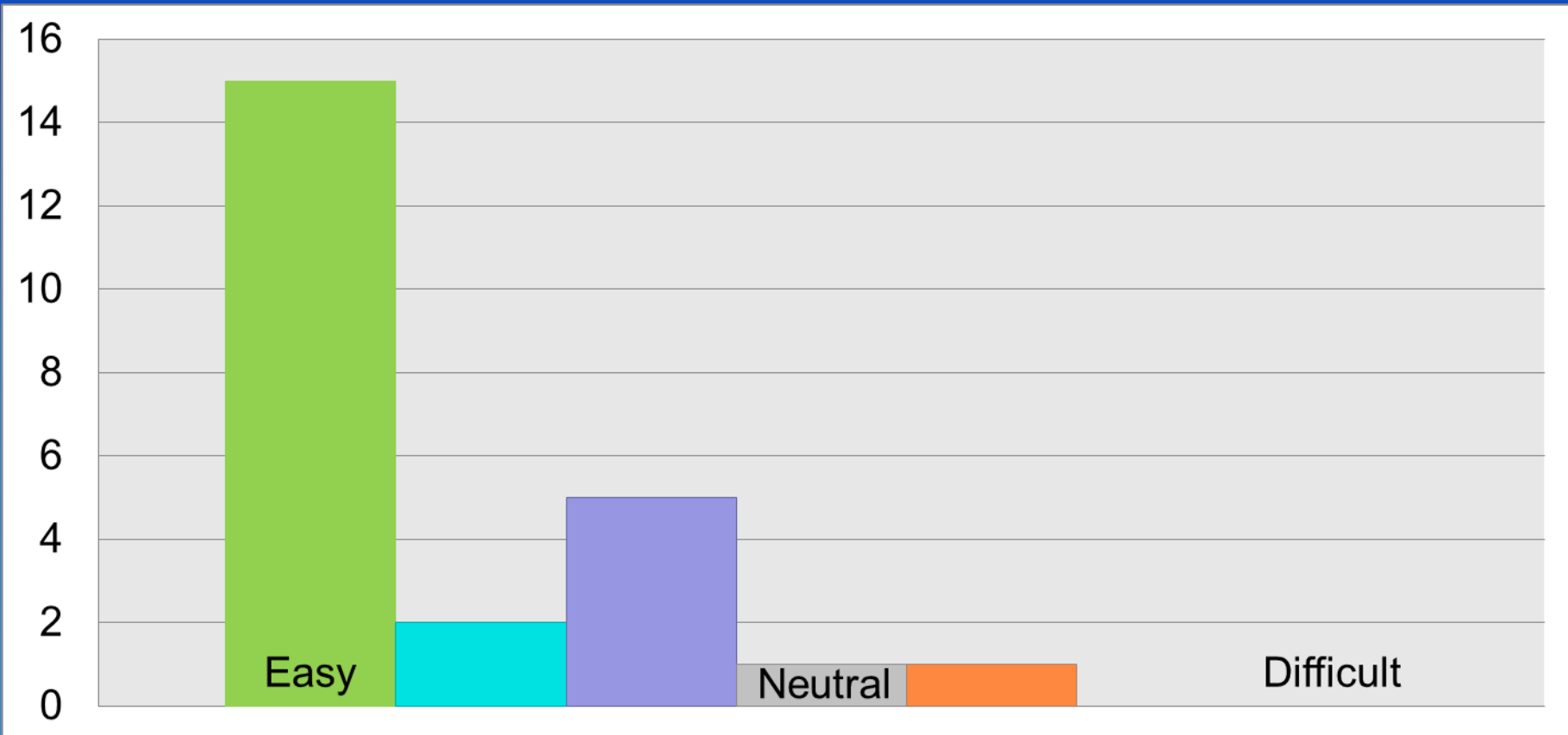
Relationships:

- Physical or Sexual Abuse
- Emotional or Verbal Abuse
- Does not feel safe



Results Risk Assessment: Satisfaction

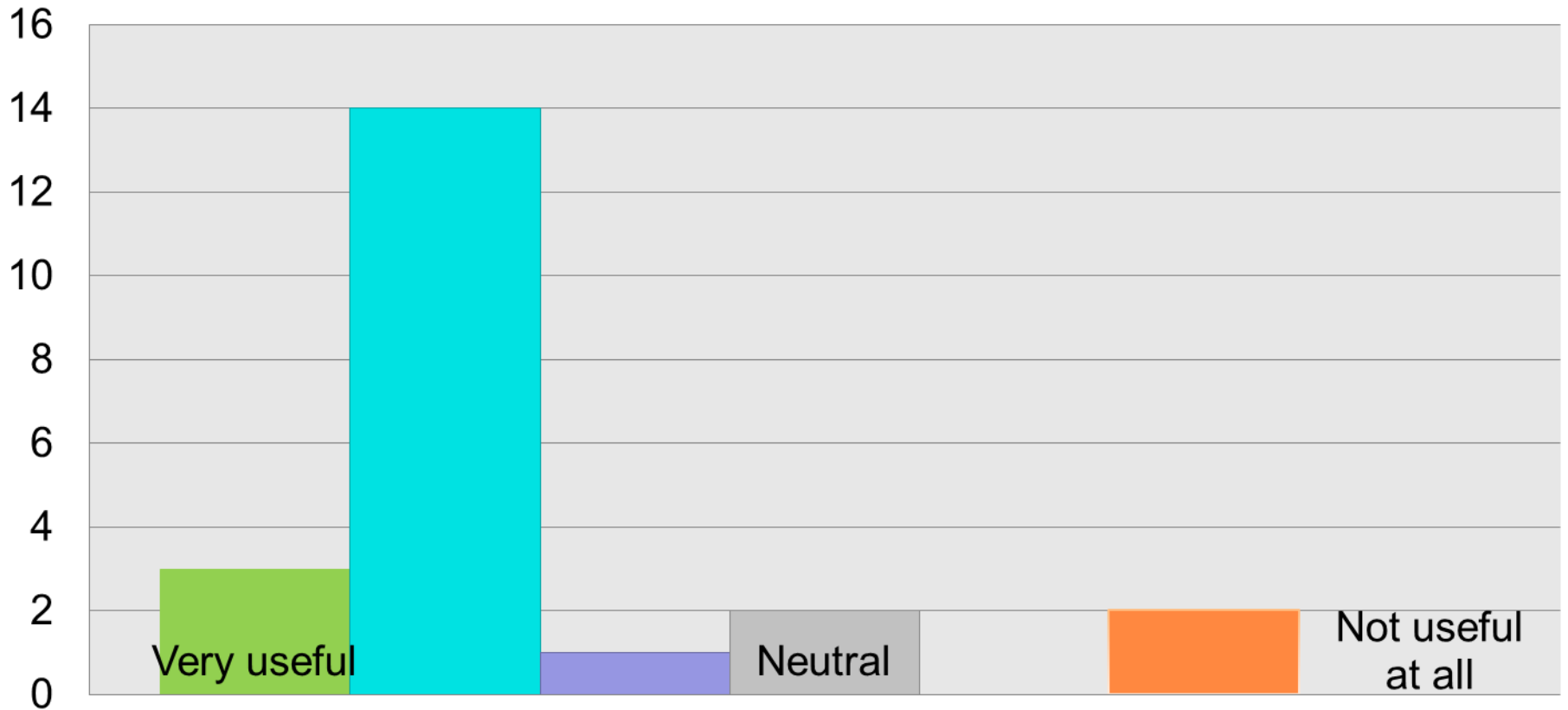
How easy or difficult were the questions to answer?





Results Risk Assessment: Satisfaction

How useful was the health survey?

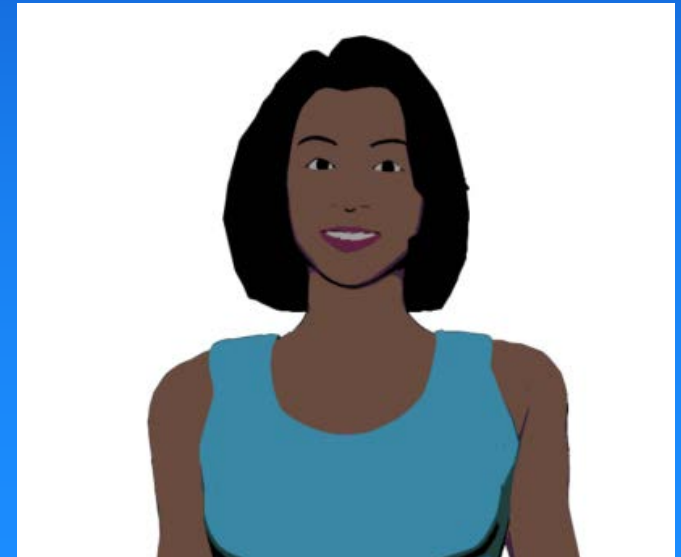


Participant Quotes: Feedback on Gabby

“Umm, its like, it seems like she is not going to judge you if, like, there are things that you did or something.”
(Participant #76)

“Sometimes the doctor is really busy - they might not have the time to answer...have time or the patience to talk with you about those issues... so in that way Gabby is better.” (Participant #61)

“The nurse or doctor they tell you, but like, how they say it, they say it in different ways. But how Gabby said it - she actually said something that I actually understood!” (Participant #76)





Results: Risk Status at 2 Month Follow-up (n=6)

Risks Discussed (per person)

11(100%)

Risks Added to MHTDL

7.2 (65%)

Status at 2 months

Resolved –
3.5 (54%)

Took Action –
2.2 (29%)

No action –
1.5 (17%)



Results: Baseline and Follow-up Stage of Change

All Risks discussed with Gabby, n=67

Initial Stage	# risks (%)	Pre-contemplation	Contemplation	Preparation	Action / Maintenance
Pre-Contemplation	16 (23)	5 (31.2)	3 (18.6)	0 (0)	4 (25.0)
Contemplation	12 (17.9)	1 (18)	2 (8.3)	0 (16.7)	8 (66.7)

All Risks Discussed with Gabby and Added to MHTDL, n=43

Initial Stage	# risks (%)	Pre-contemplation	Contemplation	Preparation	Action / Maintenance
Pre-contemplation	1 (2.3)	0 (0)	0 (0)	0 (0)	1 (100)
Contemplation	11 (25.5)	1 (9.1)	2 (18.2)	0 (0)	8 (72.7)

- Gabby best at moving those in “Contemplation” to “Action/Maintenance”
- Now focusing on intervention to move from “Pre-contemplative” to “Contemplative”



Gabby Version 2 Testing

RCT planned for Fall 2012 – Spring 2013

- 100 participants total
- Intervention participants will use system for 6 months
- Primary outcome: reduction in number of preconception risks
- Secondary outcomes: progress in stage of change; system usage and satisfaction, etc.
- Will stratify by health literacy, education, income, technology use



Future Work

- Conduct RCT (funded through HRSA BMCH) of PPEs from in OMH program (n=100)
- RCT (funded by NIMHD) of locally recruited participants (n=550)
- Then, a multisite study looking at important clinical outcomes (PTB, LBW, etc)



Challenges & Lessons Learned

- Vastness of content of Preconception Care
- Should Gabby dictate the order of risks to discuss based on clinical importance? Or should users decide for themselves?
- Length of risk assessment
 - However, users reported that it was appropriate given how thorough it is
- This model can be applied to other populations

Conclusions

- We need to build tools to assist busy clinicians in delivering comprehensive PCC
- Gabby can help
 - Screen for PCC risks
 - Deliver tailored health messages
 - Provides accurate information, every time
 - Prepares patients for office visits
 - Accepted by patients
 - Documents education and understanding
 - Provide time and cost savings
 - Can be ‘scaled’ for far reaching impact





Tailored Text-Messages to Promote Knowledge, Prevention, Social Support and Medication Adherence for People Living with HIV

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Project funded by the Agency for Healthcare Research and Quality, contract Number HHS290200600001#7.
Findings and conclusions are those of the authors and do not necessarily represent the views of AHRQ.



Background

- Over 1 million people living with HIV (PLWH) in the US and more than 50,000 new infections annually
- Antiretroviral therapy (ART) has altered HIV from an acute to a chronic, manageable condition
- Need to design and deliver programs to support PLWH to better manage their health
- Mobile phones may offer an opportunity to enhance treatment and prevention



Mobile Phones and Short Message Service (SMS)

- Mobile phones are ubiquitous
 - 83% of American adults own a mobile phone
 - SMS allows for instantaneous delivery of messages at any time/place/setting
 - SMS does not depend on fixed lines or equipment
 - SMS can be sent to multiple recipients simultaneously
 - Messages can be read when received or stored for later
- Evidence to date
 - 2 recent RCTs in Kenya have demonstrated that SMS support can improve ART adherence and rates of viral suppression in resource-limited settings



Translating Conceptual Model to Research

- We posit that an SMS-based intervention that incorporates the elements of interactivity, frequency, timing and tailoring can be implemented to:
 - Encourage greater medication adherence
 - Impact other mutually reinforcing behaviors and factors
 - Support better health care quality and outcomes

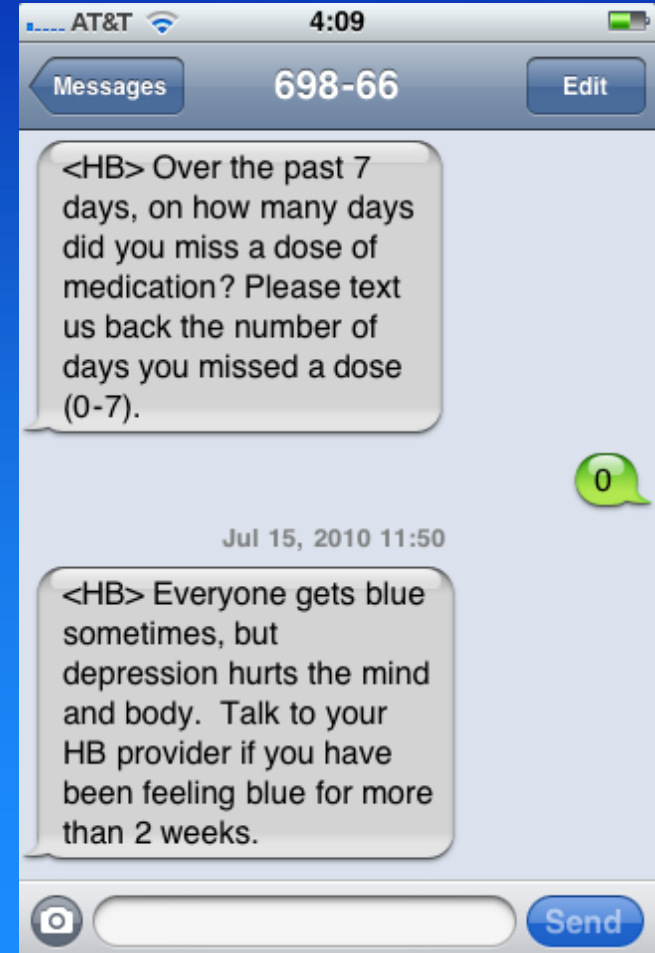
Study Purpose

- Develop, implement, and test a tailored SMS-based intervention for HIV positive men who have sex with men (MSM) to enhance outcomes related to managing HIV



Intervention Development

- Literature review
- Message development
- Expert review
- Provider review
- Limited qualitative pre-testing with target audience





Messages

- Messages addressed:
 - Medication adherence (tailored)
 - Sexual risk reduction (tailored)
 - Substance use risk reduction (tailored)
 - General health and well-being (everyone)
 - Social support (tailored/everyone)
 - Patient involvement (everyone)



Example Messages

Adherent	He shoots! He scores! Perfect med adherence. Great job!
Sex risk	Undetectable is respectable, but your partners are still infectable. Play safe.
Substance risk	Going out tonight? Be safe. Party smart.
General health and well-being	Take care of yourself today. Eat healthy foods, don't stress out, get some exercise and sleep well.
Social support	Worried about telling friends and family your status? We can help you find the right words. Call HB at 773-388-8865.
Patient involvement	Ask your provider questions. If you don't understand the answer, keep asking until you do.

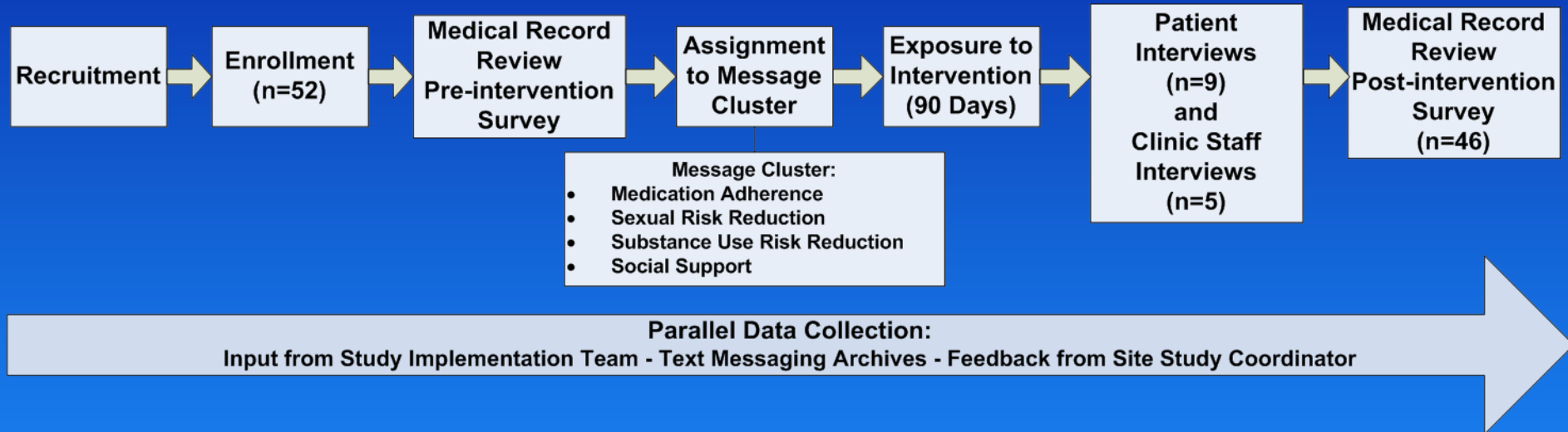


Evaluation Questions

- How did the participants react to the messages and program?

- Was the intervention associated with changes in
 - targeted knowledge, attitudes & beliefs
 - targeted risk behaviors
 - social support
 - patient involvement
 - self-reported medication adherence
 - viral load & CD4 counts

Evaluation Design



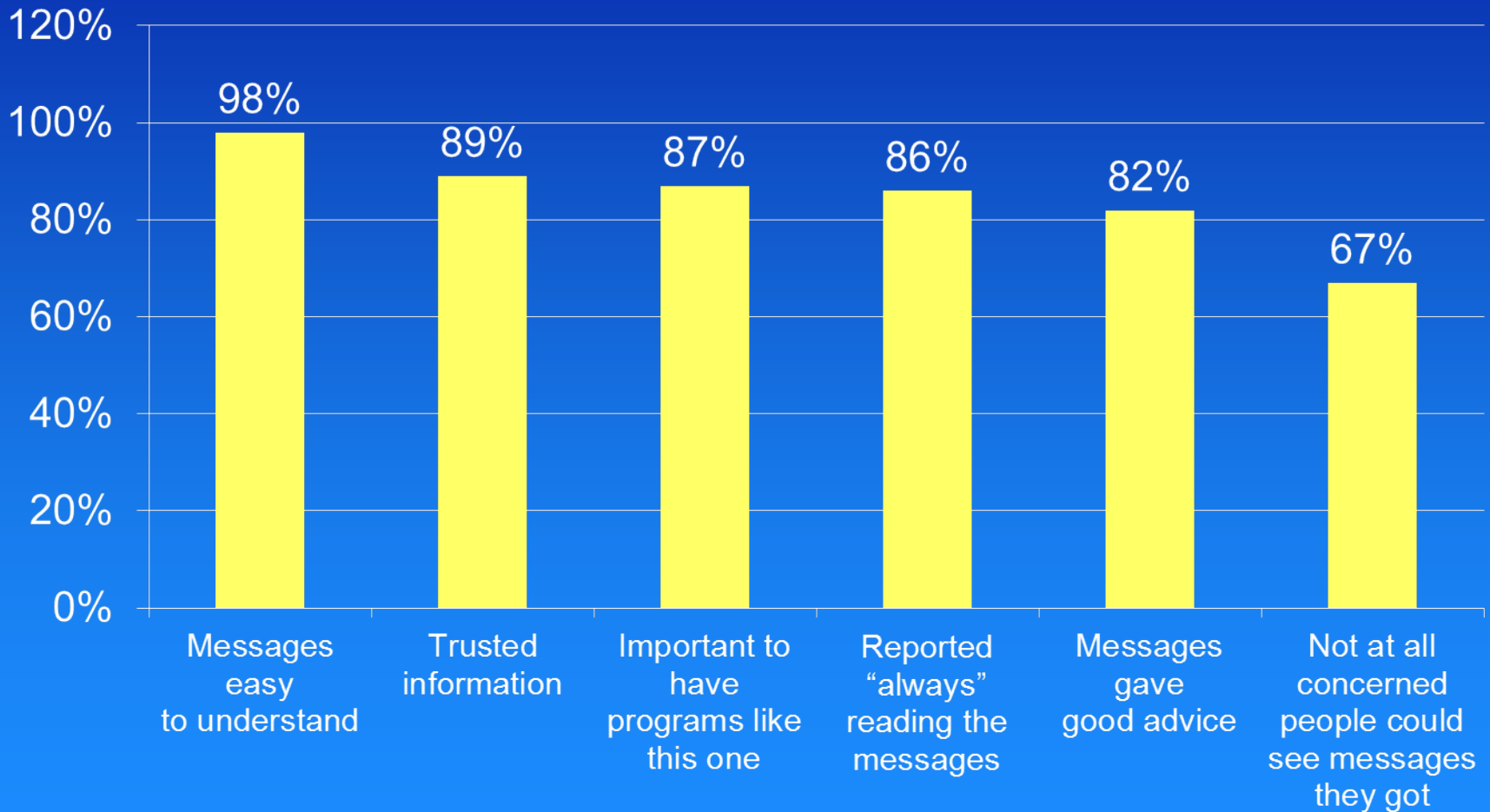


Participant Characteristics

- 52 participants enrolled
- 46 completed post-intervention survey (88% retention rate)
- Diverse in age and race/ethnicity, skewed toward more highly educated
- Almost all (92%) reported being in excellent, very good or good health



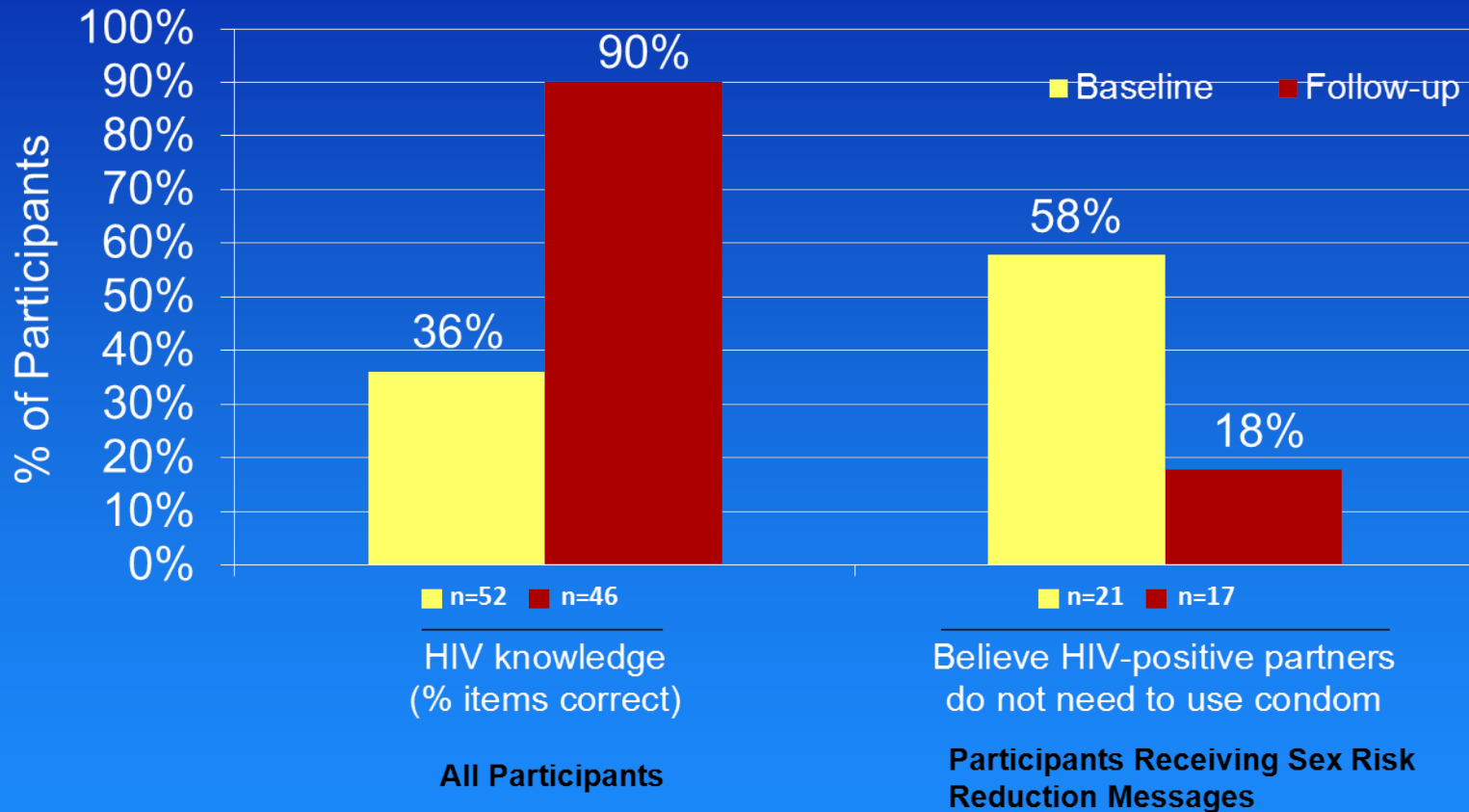
Positive Receptivity to Messages



(n=46)



HIV Knowledge, Attitudes and Beliefs



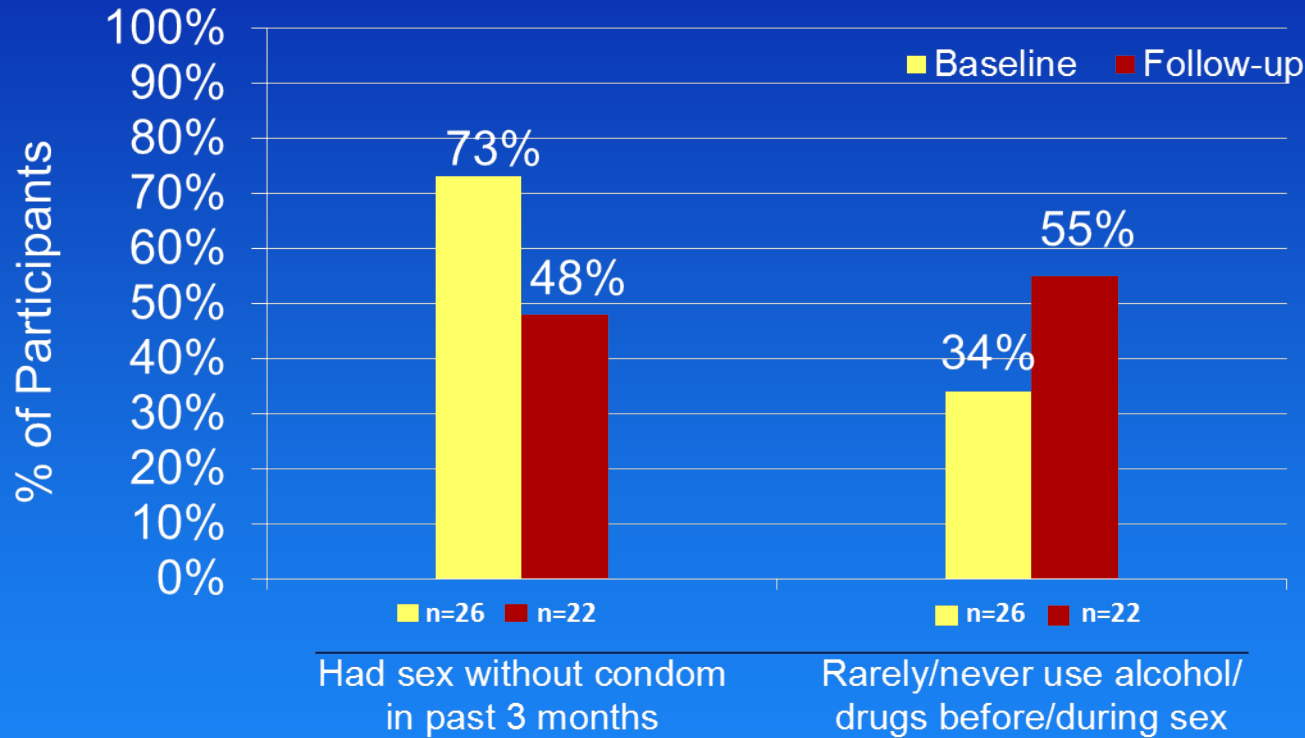
Notes:

All differences are statistically significant.

Differences between baseline and follow-up participants are due to loss at follow-up or missing data.

Smaller n's reflect SMS sent only to those with risk behavior at baseline.

Reduction in Risk Behaviors



“I guess there are some things subconsciously you internalize through the messages. There has been some benefit definitely.”

Participants Receiving Sexual Risk Reduction Messages

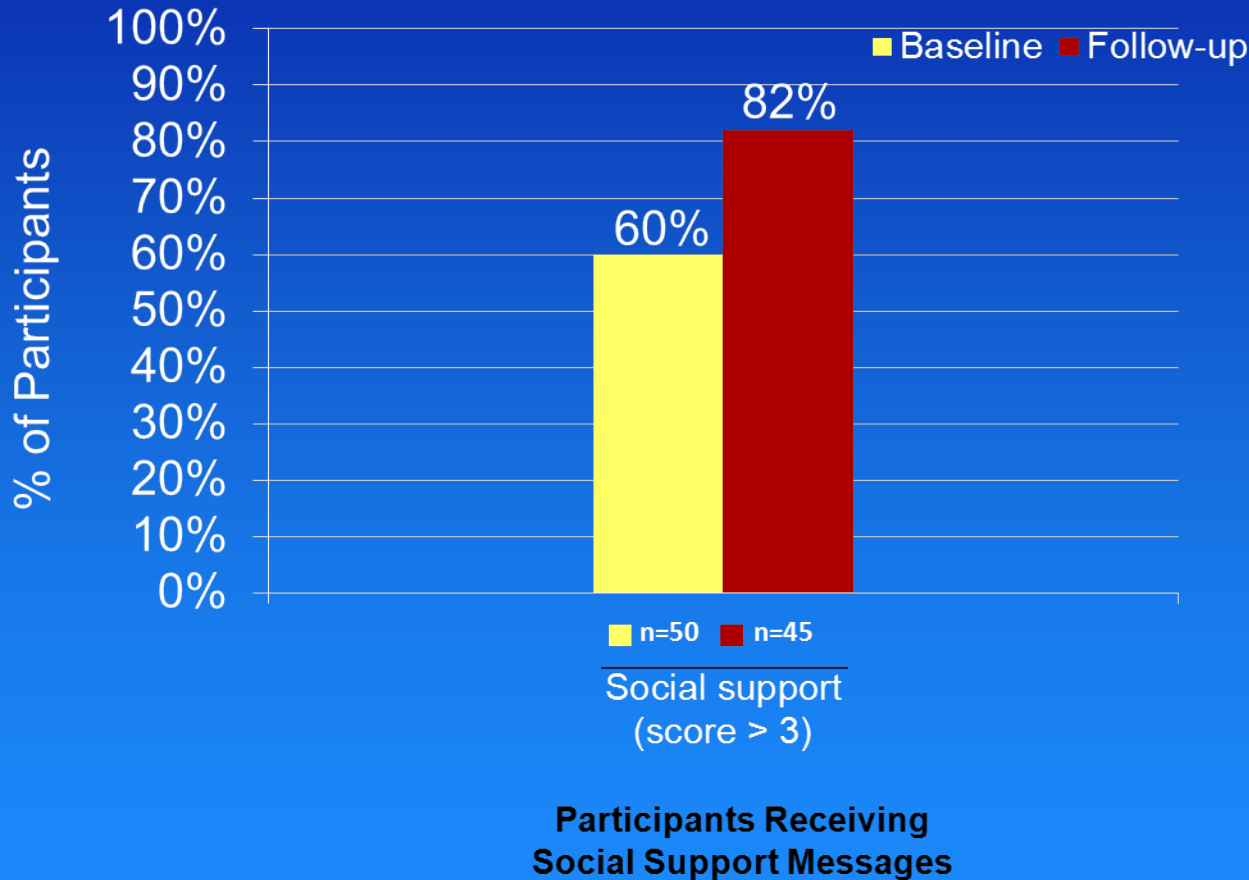
Notes:

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Smaller n's reflect SMS sent only to those with risk behavior at baseline.

Enhanced Social Support



“I was recently diagnosed as HIV positive, and it’s a pretty isolating disease...it was nice to receive messages that are positive about people who are HIV positive.”

“It wasn’t just information but more community support. You don’t get a lot of support...so it’s nice to have that.”

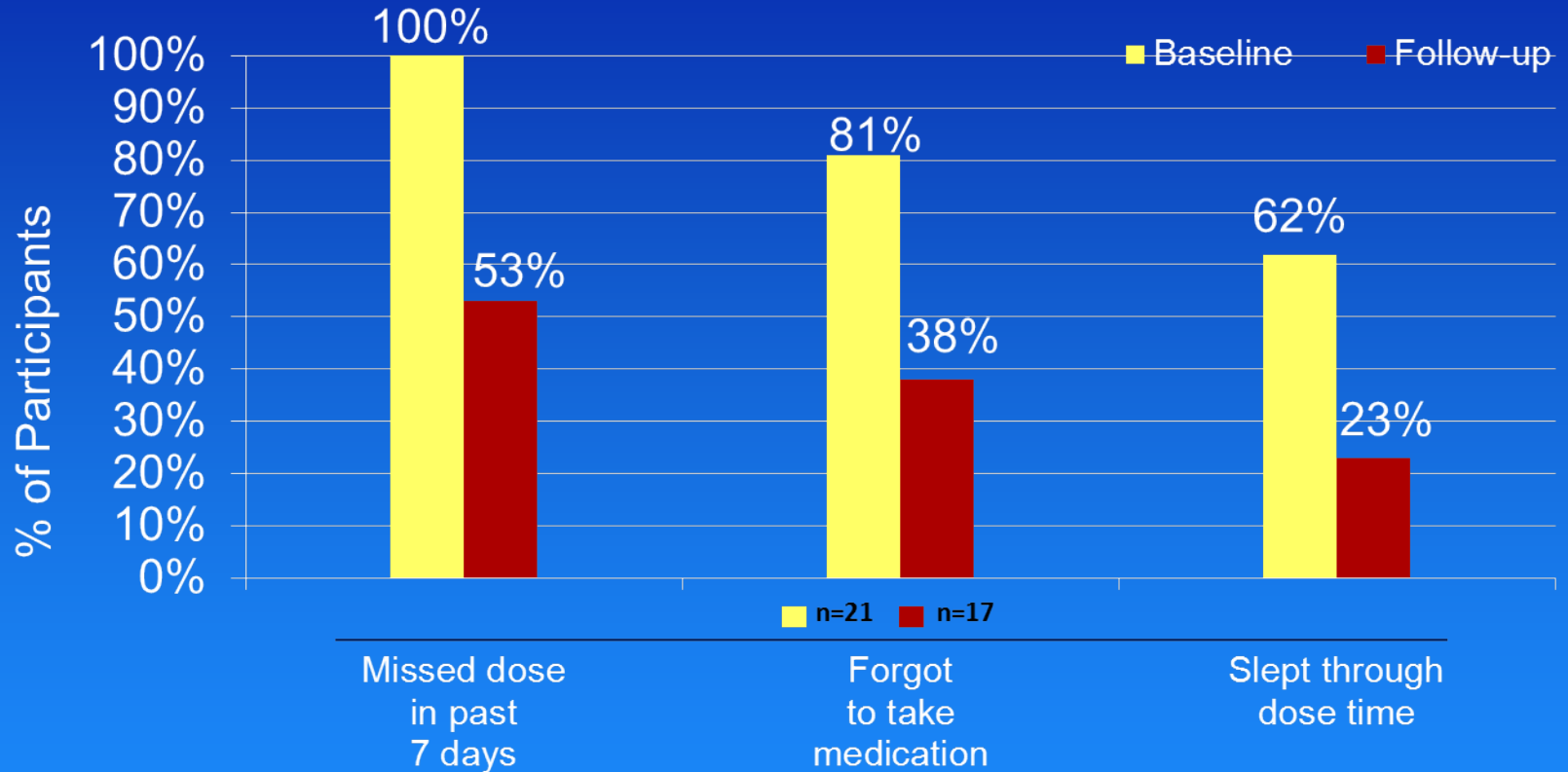
Notes:

All differences are statistically significant.

Differences between baseline and follow-up participants are due to loss at follow-up or missing data.



Improved Self-reported Adherence



Participants Receiving Medication Reminder Messages

Notes:

All differences are statistically significant.

Differences between baseline and follow-up participants are due to loss at follow-up or missing data.

Smaller n's reflect SMS sent only to those non-adherent at baseline.



Improved Clinical Outcomes

Measure	Baseline Mean (SD)	Follow-up Mean (SD)	p-value
Viral Load (HIV-1 RNA copies per mL)	69413 (231809) (n=37)	3355 (9942) (n=35)	.012
CD4 (Absolute count per mm ³)	528 (290) (n=36)	589 (291) (n=35)	.037

“It [the study] really helped. My last viral load was 85, which is next to undetectable. I wish that this would continue.”



Summary of Findings

Among HIV positive MSM, intervention was associated with a statistically significant

- increase in knowledge,
- change in beliefs,
- reduction in risk behaviors,
- increase in perceived social support, and
- improved medication adherence (self reported and clinical data)

Limitations

- Proof-of-concept study
 - Small sample size
 - No control group
 - Short follow-up period
- Study enrollment limited to individuals aged 25 or older to not compete with another ongoing study



Future Research Directions

- Dose-response relationship between message frequency and change in outcome
- Combatting message fatigue
- Establishing protocol/best practice for monitoring message delivery failure (e.g., proactively monitoring and updating participant contact info)
- Full scale study to confirm and expand upon findings
 - Larger sample size
 - Control group
 - Longer-term follow-up
 - Multiple sites
 - Younger participants



Cites for Technical Report and Related Peer-reviewed Papers

- Uhrig JD, Harris J, Furberg R, et al. Communication-Focused Technologies: Health Messages for HIV-Positive Men Who Have Sex with Men—Final Report. (Prepared by RTI International, under Contract No. HHS2902006000011#7). AHRQ Publication No. 11-0063-EF. Rockville, MD: Agency for Healthcare Research and Quality. June 2011.
- Coomes, C., Lewis, M.A., Uhrig, J.D., et al. (2012). Beyond Reminders: A Conceptual Framework for Using SMS to Promote Prevention and Improve Health Care Quality and Outcomes for Patients Living with HIV. *AIDS Care*, 24(3): 348-357.
- Uhrig, J.D., Lewis, M.A., Bann, C.M., et al. (2012). Addressing HIV Knowledge, Risk Reduction, Social Support, and Patient Involvement using SMS: Results of a Proof-of-Concept Study. *Journal of Health Communication*, 17(Sup1): 128-145.
- Lewis MA, Uhrig JD, Bann CM, et al. (in press). Tailored Text Messaging Intervention for HIV Adherence: A Proof-of-Concept Study. *Health Psychology*.
- Furberg RD, Uhrig JD, Bann CM, et al. (in press). Technical Implementation of a Multi-Component, Text Message-Based Intervention for Persons Living with HIV. *Journal of Medical Internet Research Research Protocols*.
- Harris, J.L., Furberg, R.D., Martin, N., Kuhns, L., Lewis, M.A., Coomes, C., & **Uhrig, J.D.** (in press). Implementing an SMS-Based Intervention for Persons Living with HIV. *Journal of Public Health Management & Practice*.



TEAhM: Technologies for Enhancing Access to Health Management

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TEAhM Collaborators

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- *Mary Beth Kaylor, RN, PhD*
- *Diane Mehling, RN*
- *HealthAnywhere, Inc*

This project was funded by the Agency for Health Care Research and Quality under Contract number HHS290200600024



The Quick and Dirty

- Pilot study to determine the feasibility of implementing telehealth technology in senior centers
- Hypertension selected as a test condition
- Tested the effectiveness of senior center-based telehealth on blood pressure control
- Discovered that senior center-based telehealth is feasible and ripe for further investigation
- Identified challenges that need to be addressed if a larger, definitive trial were to be implemented in this setting



Context

- The population is aging
- Caring for the elderly is expensive
- Shift away from expensive, institutionalized care to community-based care
- Interest in identifying evidence-based, technology-enhanced supports for older adults that:
 - Demonstrate a measurable clinical benefit
 - Enhance patient self-management knowledge, skills
 - Help maintain independence
 - Leverage patients' informal care network
 - Improve clinicians' efficiency and quality of care
 - Lower costs



Potential Benefits of Community-Focused Aging Services Technologies

- Extension of care into the community
 - Not ‘connected’ to office-based visits
 - Minimize transportation-related challenges
 - Increase providers’ reach
- Platform to educate seniors
 - Improve health literacy and self-management
- Engage informal care networks
 - Enhance communication
 - Improve care
 - Reduce burden



Why is the concept of ‘community’ important to older adults, policy makers and sponsoring agencies?



Provision of Care in the Community

- Older adults
 - More convenient
 - More choices
- Policy makers
 - Less expensive than institutional care
- Sponsoring agencies
 - Limited evidence base on feasible, sustainable approaches to technology-enhanced care in the community
 - Programmatic priority area



Senior Centers as a Venue for Health IT Interventions

- ~16,000 senior centers in the U.S.
- Mission-driven; eager for innovation
- AoA highly invested
 - ~6,000 centers receive support through the Older Americans Act (OAA) via service contracts to AAAs
- Firmly based in the community
- Natural extension of existing programs and services
- Efficient: one device can support many clients
- Concentrated risk pool: high risk patients self-identify/self-select



Blood Pressure as a Test Condition

- Hypertension (HTN) is an extremely common chronic condition of old age
 - Present in >70% of people aged 80+
 - Potent risk factor for stroke, MI and renal failure
- Non-invasive assessment and well-defined practice guidelines
- Self-monitoring is recommended by a number of professional medical and nursing associations
- *Home-based* self-monitoring of HTN associated with improved outcomes
 - Rationale for testing community-based approach



TEAhM Study Design

- 72 intervention participants from 2 centers
- 72 control participants from 2 centers
- No randomization; focus on logistics/feasibility
- 10 month follow-up
- Quantitative Outcomes
 - Blood pressures—baseline; weekly over 10 months, study end
 - Numerous self-reported, questionnaire-based data elements
 - Nominal, ordinal, continuous data
 - Protocol compliance
- Qualitative Outcomes
 - Nursing staff, vendor, senior center staff
 - What challenges occur when installing, maintaining telehealth kiosks?
 - Will physicians “play along”?
 - Value added for senior centers?

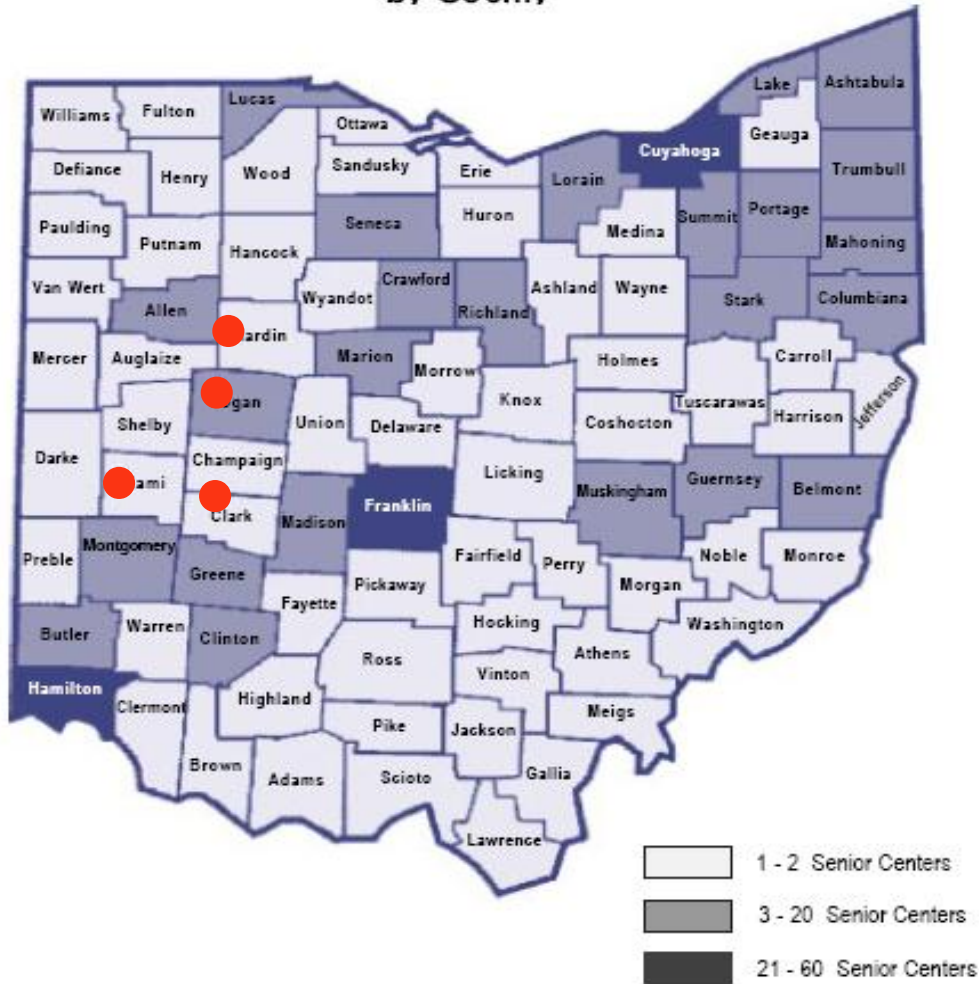


Protocol Summary

- Telehealth kiosks installed in 2 of 4 senior centers
- Hypertensive seniors enroll at all centers
 - Measure baseline BP and administer surveys
- Obtain BP referral protocols from intervention participants' PCPs
- Intervention ppts use kiosk at least 1/week
 - If high, take second reading after rest period
 - If second reading high, do “pop-up” questionnaire
- BP data streamed to nurses
 - Remote follow-up based on PCP-defined protocol
- Follow everyone for 10 months
 - Measure BP and administer surveys at study end

TEAhM Field Centers

Number of Senior Centers
by County





Participant Inclusion Criteria

- Adults ≥ 55 years
- Self-reported, physician-diagnosed hypertension
- Current use of senior center resources ≥ 1 time/week
- Clinically stable with oral therapy
- Have identified primary care physician
- Willingness to give permission for nurses and primary care physicians to interact (intervention group only)

What the Patients See



What the Patients See

My Blood
Pressure

My Blood
Oxygen

My Blood Sugar

My Weight

My
Questionnaires



online

LOGOUT



What the Patients See


Monitoring - Blood Pressure

 **Start** Instructions Reports 



Date:

Time:

SYS.

DIA. 

PUL.

online  



What the Nurses See



Sat, Dec 6, 08, 9:34:45 PM EST

- [Contact](#)
- [About](#)
- [Logon](#)
- [Reports](#)

Nurse, Admin

Team: IgeaCare

- [Patient List](#)
- [Care Plan Manager](#)
- [Video Visit Manager](#)
- [Wound Manager](#)
- [Visiting Nurse Manager](#)

- Add Patient
- Enable/Disable Patient

Patient Name	Contact Number	Vital Measurements					Reminders		Last Measured On	Last Measured By
▶ Adams, Douglas	403-555-5555	BP	BG	BO	W	T	MED	REM	Q?	
▶ Adams, John	555-555-5555	BP	BG	BO	W	T	MED	REM	Q?	
▶ Blackberry, Kelsey	1-905-555-5555	BP	BG	BO	W	T	MED	REM	Q?	
▶ Bravo, Alpha	123-456-7890	BP	BG	BO	W	T	MED	REM	Q?	
▶ caregiver_demo	123-123-123	BP	BG	BO	W	T	MED	REM	Q?	
▶ Carriero, Vito	416-802-7550	BP	BG	BO	W	T	MED	REM	Q?	



What the Nurses See



Sat, Dec 6, 08, 11:29:31 PM EST

[Contact](#)

Nurse, Admin

[About](#)

Team: IgeaCare

[Logo](#)

[Patient List](#)

[Care Plan Manager](#)

[Video Visit Manager](#)

[Wound Manager](#)

[Visiting Nurse Manager](#)

[Reports](#)

Patient, Demo Age: 73 (M)

[Patient Personal Information](#)

Device Configuration

[Rx Chart](#)

[Vital Signs](#)

[Active Alarm Rules](#)

[Video Visit](#)

[Wound](#)

[Nutrition](#)

[Exercise](#)

[Schedule](#)

[Questionnaire](#)

[Clinical Notes](#)

[Reports](#)

Services

- Today's Schedule
- Medication Reminder
- Nutrition
- Exercise
- Family Watch

- Prescription
- General Reminder
- Sensor
- Wound
- Report

- Nonprescriptions
- Questionnaire
- Calendar
- Video Visit

Vital Sign Monitoring

- Glucometer
- Spirometer
- Stethoscope

- Blood Pressure Monitor
- Oximeter
- Thermometer

- Weight Scale
- ECG

What the Nurses See

[Contact Information](#)
 [RSDI/Blackberry Account](#)
 [Attending Staff](#)
 [Clinical Information](#)
 [Er](#)

Clinical Information

Health Card Number:
 Gender: Male Female
Date of Birth:

Primary Disease:
 Height(metres):

Secondary Diseases

- Asthma
- Cardiovascular Disease
- COPD
- Hypertension
- Diabetes Type 1
- Diabetes Type 2
- Weight Loss
- Mental Health Disorder
- Cancer

Allergies

Name	Notes
<input checked="" type="checkbox"/> No Known Allergies	<input type="text"/>
<input type="checkbox"/> Environmental	<input type="text"/>
<input type="checkbox"/> Food	<input type="text"/>
<input type="checkbox"/> Medication	<input type="text"/>



Baseline Questionnaires

- Collect info relevant to HTN in old age
- Secure appropriate and sufficient data for potential design/powering of larger study
- Explore common stereotypes about rural seniors
 - Are they *really* afraid of technology?
 - Are they *really* poor and uneducated?
 - Are they *really* all obese, heavy drinkers and smokers?
 - Do they *really* ignore their doctors' advice?

Baseline

Table 1. Demographic characteristics of older hypertensive adults enrolled in the TEAhM study

Characteristic	All	Telemonitoring	Control
N	112	40	72
Mean age (years; (SD))	74.1 (8.3)	71.2 (7.8)	75.8 (8.3)
Gender (% male)	25.9	27.5	25.0
Race/ethnicity (%) ^a			
White	98.2	97.5	98.6
Marital Status (%)			
Married	49.1	45.0	51.4
Widowed	37.5	35.0	38.9
Divorced	9.8	15.0	6.9
Never Married	3.6	5.0	2.8
Education (%)			
< High School	8.9	7.5	9.7
High School Graduate	39.3	37.5	40.3
Some College	29.5	30.0	29.2
College Graduate	22.3	25.0	20.8
% of people who live alone	42.0	47.5	38.9
Currently Employed (% yes)	13.4	22.5	8.3
Mean Hours Worked per Week (SD) ^b	24.7 (17.2)	31.1 (18.1)	15.0 (10.8)
Annual Income			
<10K	5.7	2.7	7.5
\$10,000-\$20,000	22.1	27.0	19.4
\$20,001-\$30,000	26.9	21.6	29.9
\$30,001-\$40,000	19.2	29.7	13.4
\$40,001-\$50,000	16.4	8.1	20.9
>\$50,000	9.6	10.8	9.0

^a Participant could identify more than one race/ethnicity group.

^b Asked only of participants who reported being currently employed for wages.

Baseline

Characteristic	All	Tele monitoring	Control
How Long Since Last Seen Doctor (%)			
<=6 mos	94.6	92.5	95.8
6 mos to <1 year	3.6	5.0	2.8
1 year to <3 years	1.8	2.5	1.4
Hospitalizations in Past Year (%)			
0	83.9	90.0	80.6
1	12.5	7.5	15.3
>=2	3.6	2.5	4.2
Mean Hospitalizations due to Blood Pressure (SD) ^c	0	0	0
ER Visits in Past Year (%)			
0	81.3	82.5	80.6
1	17.0	17.5	16.7
>=2	1.8	0	2.8
Mean Age at Hypertension Diagnosis (years; (SD))	58.0 (13.8)	53.8 (14.0)	60.3 (13.3)
Smoked >100 Cigarettes in Lifetime? (% yes)	40.5	47.5	36.6
Current Smoker? (% yes) ^d	5.9	6.9	5.1
Currently Drink Alcohol? (% yes)	29.5	37.5	25.0
Mean Drinks in Typical Week? (SD) ^e	1.6 (1.2)	1.4 (0.5)	1.7 (1.5)
Ever Been Told to Reduce Fat Intake? (% yes)	72.3	65.0	76.4
Currently Following this Advice? (% yes) ^f	81.5	73.1	85.5
Ever Been Told to Lose Weight? (% yes)	46.9	61.5	38.9
Currently Following this Advice? (%yes) ^g	71.2	58.3	82.1

Baseline

Characteristic	All	Tele monitoring	Control
Blood Pressure Ever Measured at This Center? (% yes)	58.9	60.0	58.3
Prescribed Blood Pressure Medication (% yes)	98.8	97.6	98.6
Satisfaction with Current Health Care Team (%)			
Very Satisfied	52.7	30.0	65.3
Satisfied	41.1	55.0	33.3
Neither	5.4	12.5	1.4
Dissatisfied	0.9	2.5	0
Very Dissatisfied	0	0	0
Level of Understanding of BP Control (%)			
Excellent	46.0	30.8	54.2
Very Good	36.0	35.9	36.1
Good	16.2	28.2	9.7
Fair	0.9	2.6	0
Poor	0.9	2.6	0
Mean First BP Measurement (mmHg; (SD)) ¹			
Systolic	137 (21.7)	132.4 (22.4)	140.4 (20.9)
Diastolic	78.8 (11.8)	75.8 (11.7)	80.5 (11.6)
Mean Second BP Measurement (mHg; (SD)) ¹			
Systolic	135.3 (21.2)	131.0 (21.0)	137.7 (21.1)
Diastolic	77.7 (11.1)	76.3 (12.0)	78.5 (10.5)
First BP < 140/90 (%) ¹	58.9	75.0	50.0
Second BP < 140/90 (%) ¹	58.0	70.0	51.4
Mean BMI (kg/m ² ; (SD)) ¹	30.5 (5.6)	32.8 (6.3)	29.2 (4.7)

Baseline

Table 1. Baseline experience and comfort with technology among older hypertensive adults enrolled in the TEAhM study

Characteristic	All	Telemonitoring	Control
N	112	40	72
Ever Owned Home Computer (% yes)	64.3	75.0	58.3
Currently Own Home Computer (% yes) ^a	94.4	93.3	95.2
Comfort Level with Home Computer (%) ^b			
Very comfortable	38.8	29.6	45.0
Somewhat Comfortable	41.8	59.6	30.0
Somewhat Uncomfortable	3.0	0.0	5.0
Very Uncomfortable	16.4	11.1	20.0
Ever Owned Cellular Phone (% yes)	84.7	90.0	81.7
Currently Own Cellular Phone (% yes) ^c	89.4	88.9	89.7
Comfort Level with Cellular Phone (%) ^d			
Very comfortable	63.1	50.0	71.2
Somewhat Comfortable	26.2	34.4	21.2
Somewhat Uncomfortable	8.3	9.4	7.7
Very Uncomfortable	2.4	6.3	0.0
Ever used BP device? (%yes)	83.9	85.0	83.3
Used BP device at least 100 times (% yes) ^e	42.5	33.3	47.4
Comfort Level Using BP Device ^e			
Very comfortable	79.8	73.5	83.3
Somewhat Comfortable	18.1	23.5	15.0
Somewhat Uncomfortable	1.1	0.0	1.7
Very Uncomfortable	1.1	2.9	0.0

^a Asked only of participants who reported having ever owned a home computer

^b Asked only of participants who reported currently owning a home computer

^c Asked only of participants who reported having ever owned a cellular phone

^d Asked only of participants who reported currently owning a cellular phone

^e Asked only of participants who reported having used an automatic blood pressure cuff outside of a doctor's office visit.



Experience with the BP Intervention/technology

	Baseline (after training)	End of study
N	40	38
Anxiety Level While Using Cuff Training (%)		
Very Anxious	2.5	5.3
Somewhat Anxious	17.5	10.5
Not Anxious at All	80.0	84.2
Ease of Use of BP Cuff (%)		
Very Easy	85.0	71.1
Somewhat Easy	12.5	26.3
Somewhat Difficult	2.5	0.0
Very Difficult	0.0	2.6
Anxiety Level While Using Health Station Training (%)		
Very Anxious	10.0	0.0
Somewhat Anxious	27.5	7.9
Not Anxious at All	62.5	92.1
Ease of Use of Health Station (%)		
Very Easy	62.5	81.6
Somewhat Easy	30.0	15.8
Somewhat Difficult	5.0	2.6
Very Difficult	2.5	0.0
Recommend BP Telehealth to Friends? (% yes)	N/A	89.5



Self Rated Health and BP at Study End

Characteristic	All	Telemonitoring	Control
Self-Rated Health at 10 months			
Excellent	7.6	7.9	7.5
Very Good	39.1	36.8	40.3
Good	43.8	47.4	41.8
Fair	8.6	5.3	10.5
Poor	1.0	2.6	0.0
Mean First BP Measurement (mmHg; (SD))			
Systolic	132.4 (22.8)	127.8 (20.9)	135.0 (23.7)
Diastolic	76.2 (10.9)	77.8 (10.0)	75.3 (11.4)
Mean Second BP Measurement (mHg; (SD))			
Systolic	130.1 (20.8)	126.1 (19.8)	132.5 (21.1)
Diastolic	74.3 (10.1)	76.6 (11.6)	73.0 (8.9)
First BP < 140/90 (%)	63.5	73.7	57.6
Second BP < 140/90 (%)	67.7	68.4	67.2



Service Utilization Among Participants with ≥ 1 Contact

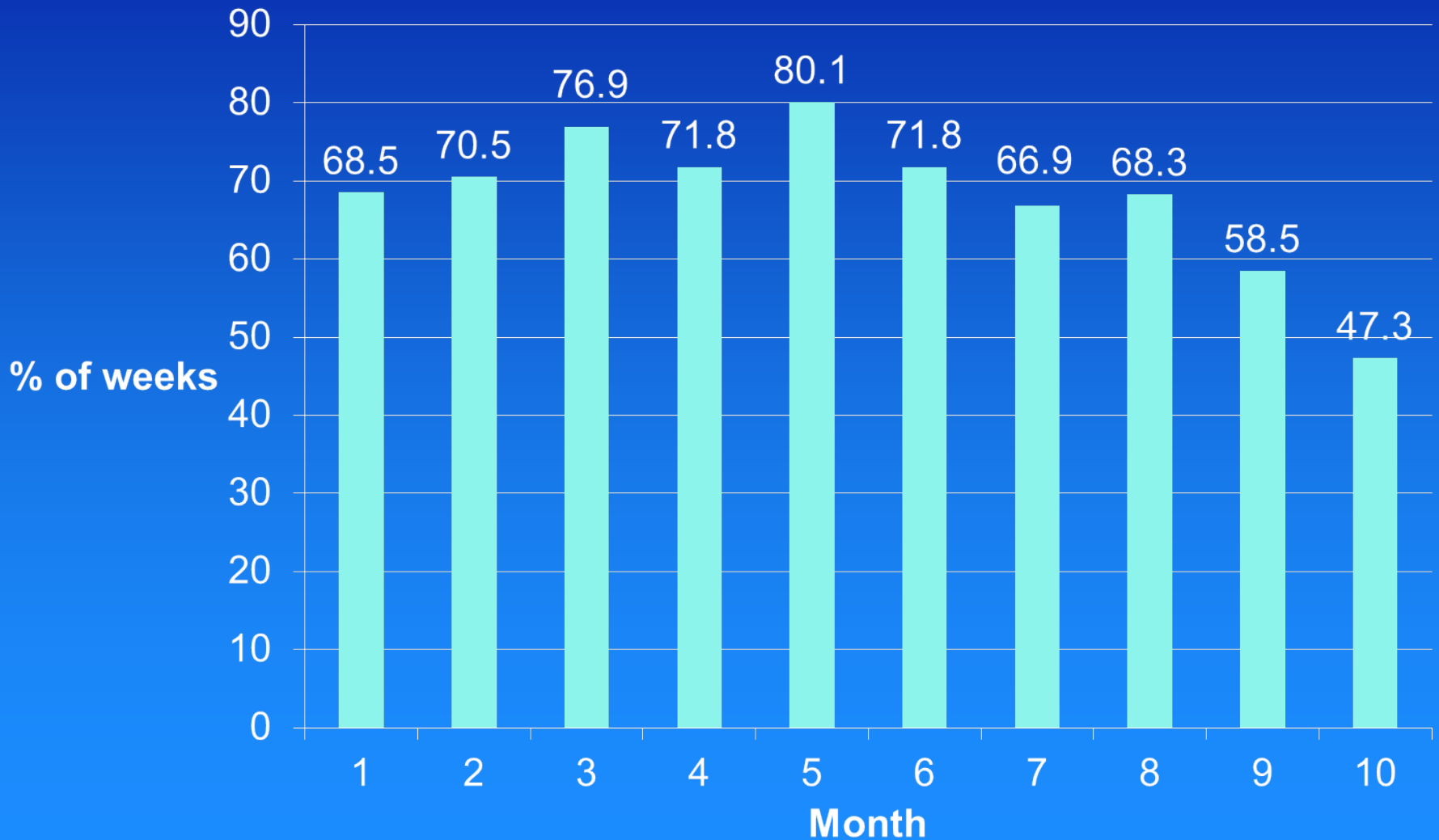
Characteristic	All	Telemonitoring	Control
N	112	41	71
Average Number of PCP Visits (SD)	3.4 (2.8)	3.8 (3.3)	3.2 (2.5)
Average Number of PCP Visits for BP (SD)	0.3 (0.9)	0.3 (0.6)	0.4 (1.1)
Average Number of ER Visits (SD)	0.4 (0.8)	0.4 (1.0)	0.4 (0.6)
Average Number of ER Visits for BP (SD)	0.0 (0.2)	0.0 (0.0)	0.1 (0.3)
Average Number of Hospital Visits (SD)	0.4 (0.8)	0.4 (0.9)	0.3 (0.7)
Average Number of Hospital Visits for BP (SD)	0.0 (0.2)	0.0 (0.0)	0.0 (0.3)
Stay in Hospital for BP >1 day? (% yes)	0.9	0.0	1.4
Experienced Challenges Due to BP (% of participants)	10.7	12.2	9.9
Experienced Challenges Due to BP (% of visits)	3.0	2.7	3.1



Adherence Measures

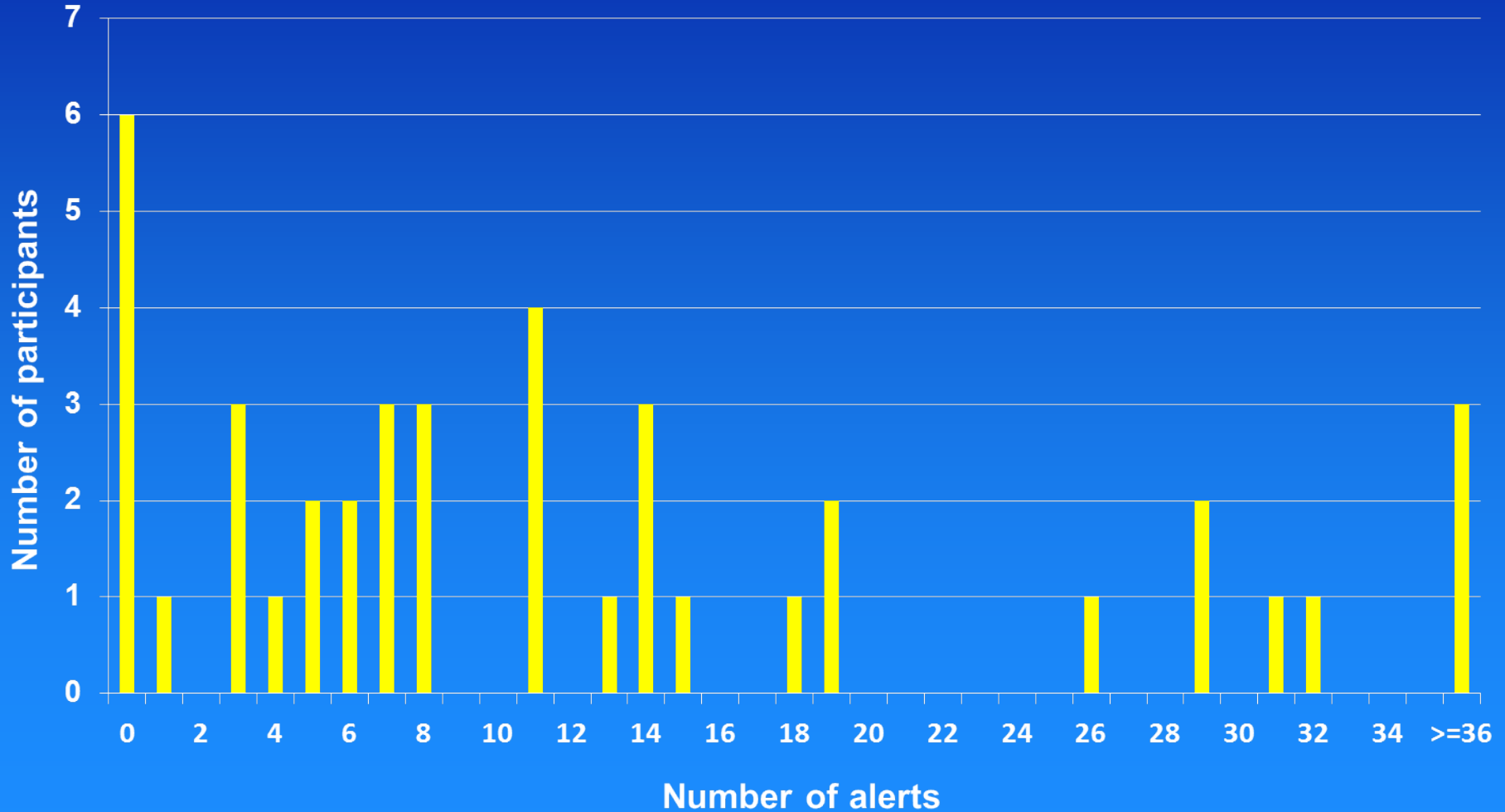
Measure	Overall	Logan	Urbana
Weeks with at least 1 BP reading (%)	69.1	69.4	68.6
High readings with a 2 nd reading (%)	61.1	51.1	75.2
High readings with a questionnaire (%)	12.9	12.9	12.8
High readings with a nurse follow-up in the same day* (%)	62.5	73.4	50.0
High readings with a nurse follow-up within 1 day* (%)	70.5	77.3	62.5
Weeks with multiple BP readings (%)	17.0	15.9	19.0

Adherence: Use of kiosk ≥ 1 /week, by month





Frequency Distribution of the Number of Blood Pressure Alerts per Participant





Technical Considerations

- Internet connectivity in rural areas
 - Interruptions and unreliable service
- ISP
 - Small; inconsistent, low quality support
- Hardware
 - Blue tooth; frozen screen; touch screen insensitivity; blood pressure cuff
- Software
 - ‘Send’ button; pop-up questionnaire; sleep mode
- Technology Literacy
- Cuff Placement and Compliance



Thinking Strategically About Community-Focused Aging Services Technologies

- Doctors' offices will decrease in importance as the sole physical site for receipt of chronic disease management
 - Novel community-based venues will become increasingly important
- Seniors' informal care networks will be better integrated with technological supports
 - Information sharing will enhance the ability of informal care providers to assist seniors



Thinking Strategically About Community-Focused Aging Services Technologies

- Seniors need access to services that are convenient for them
 - Seniors will have many choices in the future
 - They will likely choose options that maximize convenience, quality and cost
- Integration of various sources of health information and services streams will be challenging, but it will happen eventually
 - Seniors and aging services providers need to have workable models of technology-enabled service provision in order to maximize benefit



For More Information – View Final Reports

- Communication-Focused Technologies for Improving the Health of Young African-American Women. Five appendixes including tools and questionnaires are provided as well. December 2011. AHRQ Pub No. 120013EF. Available at: http://healthit.ahrq.gov/CommTechforAAWomen_ACTIONfinrep.pdf
- Health Messages for HIV-Positive Men Who Have Sex With Men. The final report summarizes the key findings, limitations, lessons learned, and recommendations for future research. June 2011. AHRQ Pub No. 110063EF. Available at: http://healthit.ahrq.gov/hlthmsgs_HIVposmen_ACTIONfinrep.pdf
- Technologies for Enhancing Access to Health (TEAhM). The final report highlights lessons learned for elders, community centers, and clinicians, as well as recommendations. June 2011. AHRQ Pub No. 110066EF. Available at http://healthit.ahrq.gov/TechforEnhancingAcctoH_ACTIONfinrep.pdf



Q & A Session

Please submit your questions by using the Q&A box to the lower right of the screen.



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