

# A SYSTEMATIC REVIEW OF TECHNOLOGY-BASED INTERVENTIONS IN IMPROVING HYPERTENSION MANAGEMENT IN RACIAL ETHNIC MINORITIES IN THE US

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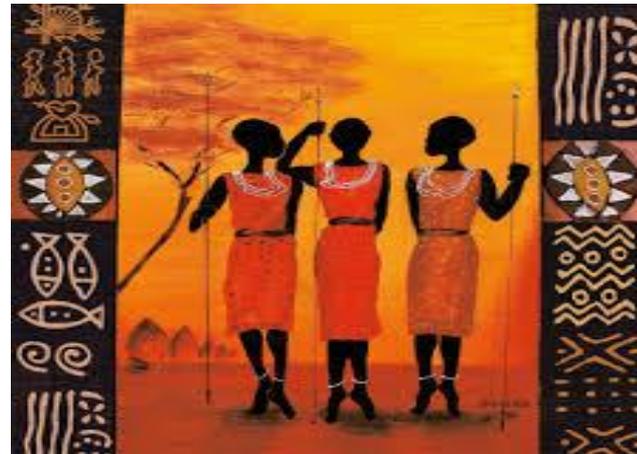


# BACKGROUND

- Racial ethnic minorities
  - the fastest growing communities in the US
  -
- High rate of uncontrolled hypertension (HTN)
  - 35% in African-Americans
  - 32% in Latinos
  - $\geq 40\%$  in Chinese and other Asian immigrants
- Under-represented in HTN research
- Technology-based interventions
  - effective in HTN management in the general US population
- Such a program is limited in racial ethnic minorities

# STUDY AIM

- This systematic review was undertaken to identify effective, technology-based interventions for management of HTN in racial ethnic minorities in the US.



# METHODS (I)

- ◉ A systematic review was conducted
  - Using Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA)
- ◉ Studies published from Jan 2000 - Dec 2015 were searched using the following databases:
  - PubMed
  - Web of Science
  - CINAHL Plus
  - Psyc INFO
  - Science Direct
  - ProQuest
  - the Cochrane Library
- ◉ Keywords: HTN management, blood pressure, telemedicine, telehealth, ehealth, & digital health.
- ◉ 2 investigators conducted the searches & the third reviewer was consulted for the final selection

# METHODS (II)

## ○ Criteria:

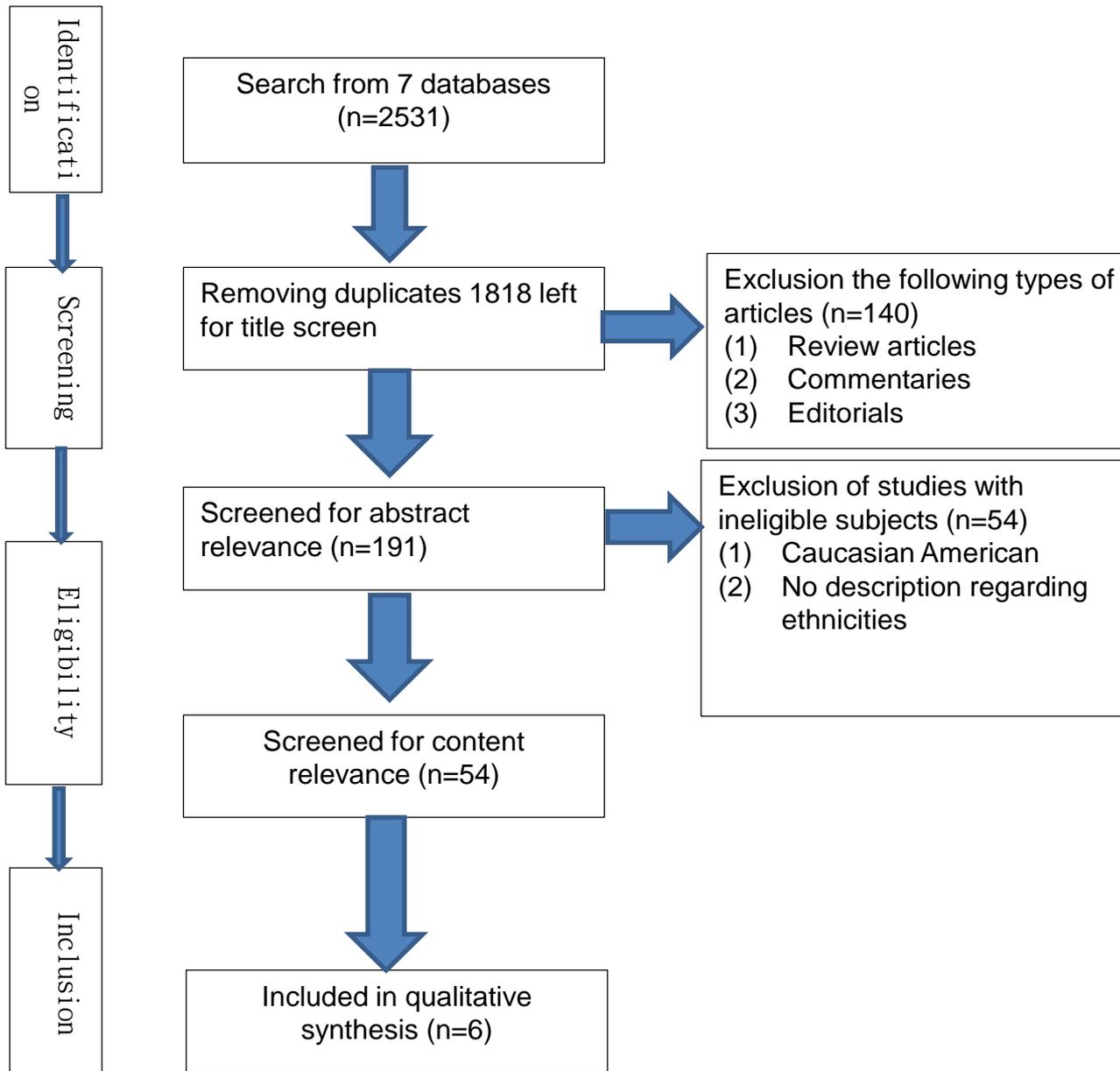
- Racial ethnic minorities focused study
- Technology-based intervention (e.g., telemedicine)
- HTN management

## ○ 2531 were identified → 6 studies in the final.

- Exclusion of duplicated studies and studies which did not meet criteria

## ○ Analysis

- Qualitative synthesis



# REVIEW PROCEDURE

2531  
(7  
databases)

1818  
(duplicate  
removed)

191  
(relevant  
abstract)

54  
(relevant  
abstract)

6  
(relevant  
abstract)



# QUALITY OF RESEARCH

## ○ Jadad scale

- To assessing quality and risk of bias
  - Randomization
  - Double- blind
  - Withdrawals & drop-out
- Range 0-5 points
  - 0-2: Low quality
  - 3-5: high quality

## ○ Quality of 6 studies - 5 had a high quality (100% agreement between two raters)

- 1 study - 4 points
- 4 studies -3 points
- 1 study - 1 point

# VARIABLES (QUALITATIVE SYNTHESIS)

- ◉ Types of studies
- ◉ Subjects (ethnicity)
- ◉ Recruitment sites
- ◉ Duration of study
- ◉ Types of interventions
- ◉ Cultural sensitivity of interventions
- ◉ Incentives
- ◉ Home blood pressure monitor
- ◉ Outcomes

# RESULTS



# RESULTS (I)

## ○ Types of studies:

- 5 RCTs
- 1 quasi-experimental study

## ○ Subjects:

- 6 recruited African Americans in the US
- Among 6, one also recruited Latino
- N = 26-954

## ○ Recruitment sites:

- 2 - from community centers
- 4 - from health care centers



# RESULTS (III)

## ◉ Duration of studies:

- 3-12 months

## ◉ Types of interventions:

- 4 - home monitors + nurse counseling via phone
- 1 - storytelling video
- 1- automated, computer-based, telephone counseling system



# RESULTS (III)

## ○ Cultural sensitivity of interventions

- 2- focused on cultural sensitive component
  - automated telephone counseling & storytelling
- 4 - did not report on this

## ○ Incentives

- 2 - frequent incentives (offered at each visit)
- 1 - only one incentive at the end of the study
- 3 - not reported

# RESULTS (IV)

## ⊙ Outcomes:

- 3 - measures blood pressure control (BPC) only
- 2 - BPC + other cardiovascular risk behaviors
  - Other behaviors- medication adherence, physical activity, diet, & weight management
- 1 - BPC + other blood pressure related factors
  - Other factors - frequency of BP taking & number of antihypertensive medications

## ⊙ BP measurement:

- 4 - BP measured by participants (home monitors)
- 2 - BP measured by research assistants (used at office)

# RESULTS (V)

## ○ BP monitor - measured by participants

Studies	Type	New & Calibrated	Pt taught on its use	Flash light/ stethoscope	DBP Korokoff 4 or 5
Artinian 2001	Electronic	Yes	Yes	Flash light	N/R (Not reported)
Artinian 2007	Electronic	Yes	Yes	Flash light	N/R
Bondmass 2000	Electronic	N/R	Yes	Flash light	N/R
Brennan 2010	Electronic	N/R	Yes	Flash light	N/R

# RESULTS (VI)

## ○ BP monitor - by research assistant (RA)

Studies	Type	New & Calibrated	RA trained on its use	Flash light/ stethoscope	DBP Korokoff 4 or 5
Houston 2011	Electronic	N/R	Yes	Flash light	N/R
Migneault 2012	Electronic	Yes	Yes	Flash light	N/R

# RESULTS (VII)

## ◎ BP reduction

- SBP: -2.3 to -24.7 mmHg
- DBP: - 0 to 14.6 mmHg

## ◎ Greatest BP reduction

- -24.7 & -14.6 mmHg for SBP and DBP, respectively
  - Artinian 2001 study
    - RCT
    - N = 26 with 3 month follow-up
    - Home monitors + nurse counseling via phone
      - Measured BP at home 3x/week for 12 weeks
      - Sent back BP readings via a phone line
      - Received nursing counseling via phone 1x/week
    - Frequent incentive
    - High quality of research (Jadad scale point = 3)
    - Recruitment from a community center

# DISCUSSION

# DISCUSSION (I)

- ◉ Combined two or more technology-based approaches - the most effective in managing HTN
- ◉ Frequent incentive
- ◉ BP measurements at home at least 3x/wk
- ◉ Received nursing counseling via phone or online 1x/wk
- ◉ Cultural sensitivity
- ◉ None was done in Chinese Americans



# DISCUSSION (III)

- ◉ Majority (n=4) used home BP monitors
  - Not all reported calibration (n =2)
  - Patient teaching of its use (n =4)
  - Korotkoff phase should be reported for diastolic BP (n =0)



# LIMITATION

- 6 studies were reviewed
  - technology-based, HTN management in racial ethnic minority groups
- The most effective intervention was found in a study with:
  - A small sample size
  - 3 -month follow-up
  - No mention of cultural sensitivity
  - Single outcome

# FUTURE DIRECTIONS

- More technology-based studies with the following factors are suggested for studying HTN management in racial ethnic minorities.
  - a longer follow-up duration (e.g., >6-12 months)
  - cultural sensitivity
  - measurement of multiple outcomes
- Need to determine how much the intervention helps an individual continue his BP control without ongoing counseling
- Similar studies need to be done in Chinese Americans, who have high rate of uncontrolled HTN (~40%)

**THANK YOU**