



# Tackling the Dementia Burden: Spirituality and Cognitive Health

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# Overview

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Background

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Preliminary Studies

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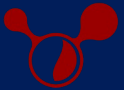
Religion, Spirituality & Inflammation

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Discussion

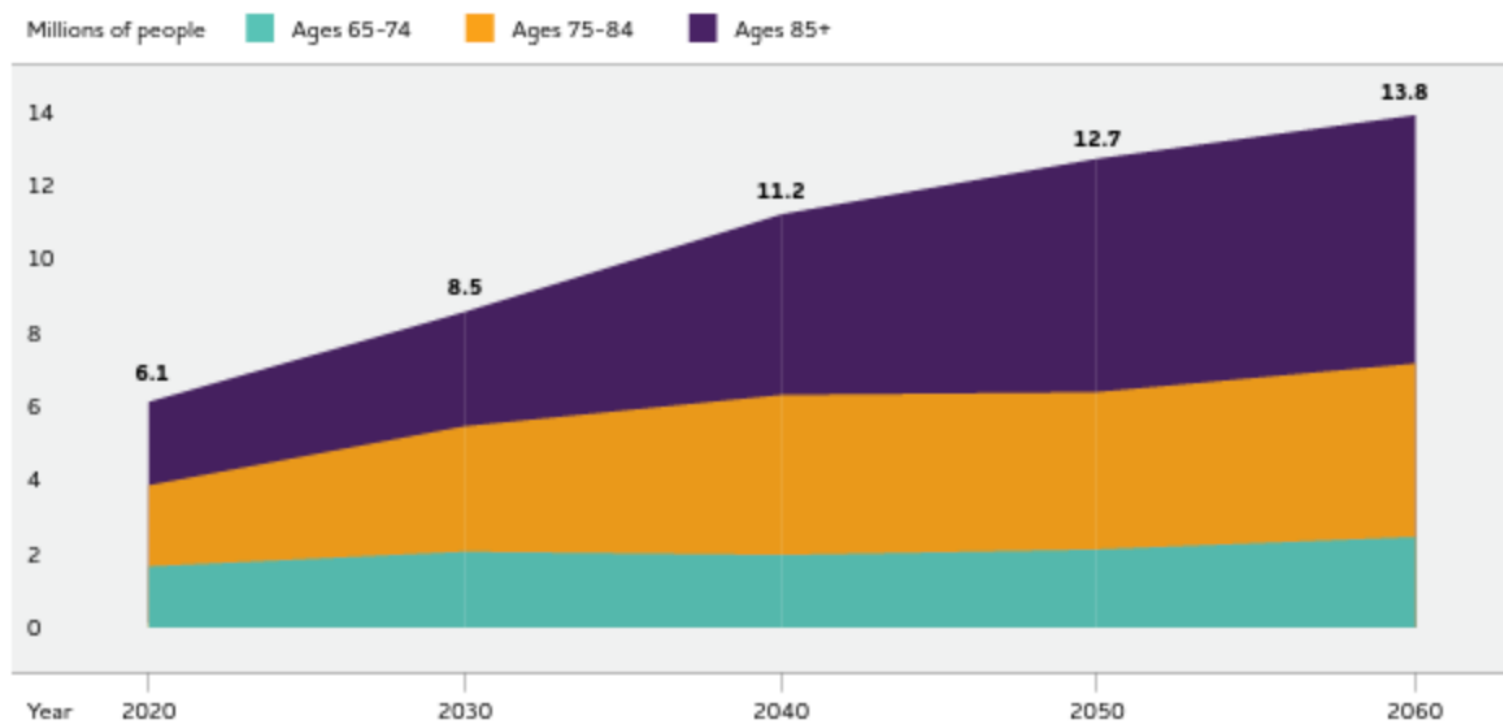


# My Background



# Rising Dementia Burden

Projected Number of People Age 65 and Older (Total and by Age) in the U.S. Population with Alzheimer's Dementia, 2020 to 2060



Created from data from Rajan et al.<sup>16,224</sup>

Alzheimer's Association, 2022& 2023



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## Cognitive Disparities

Due to  
persistent social  
&  
health inequities

Background

Historically underrepresented  
populations greater risk

Population growing in  
diversity

Rise in dementia



# Dementia Continuum Cognitive Decline



Cognitive Decline

Neuropsychiatric/Behavioral Symptoms

Sleep Disturbance



Background



## Spirituality

- Cultural resource, including beliefs and **practices** (which include spiritual & religious practices)
- Positive psychological emotions
- Stress and anxiety reduction
- Meaning & Purpose
- Limited studies in Mild Cognitive Impairment & dementia population



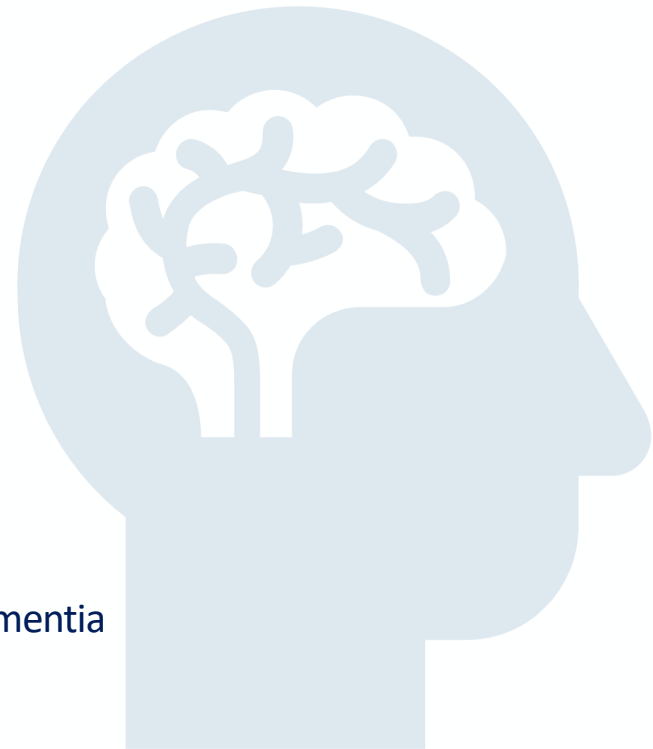
(Koenig, 2012; Koenig, 2015) <sup>7</sup>



# Spirituality and Cognitive Health

## AIM

- To identify resilience factors for decreasing the dementia burden

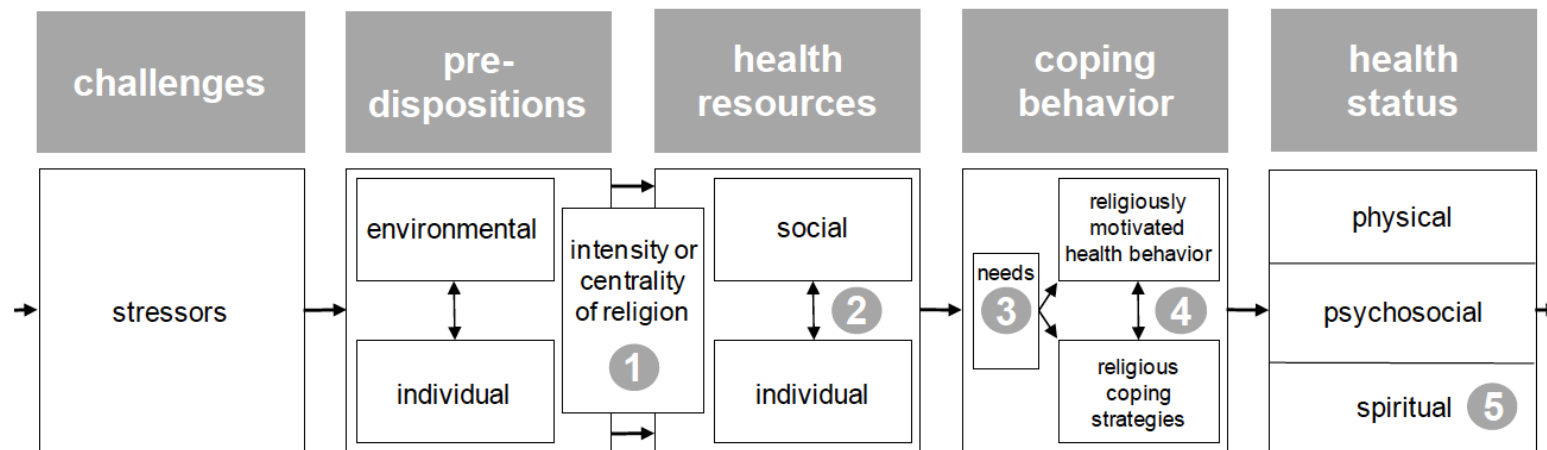




# VULNERABILITY STRESS MODEL

+

# SPIRITUALITY/RELIGIOSITY



Framework

(Ingram, 2001; Lazarus & Folkman, 1984; Zuckerman, 1999; Zwingmann et al., 2011)

# My Preliminary Studies

1. Identify Ways to Support Spirituality

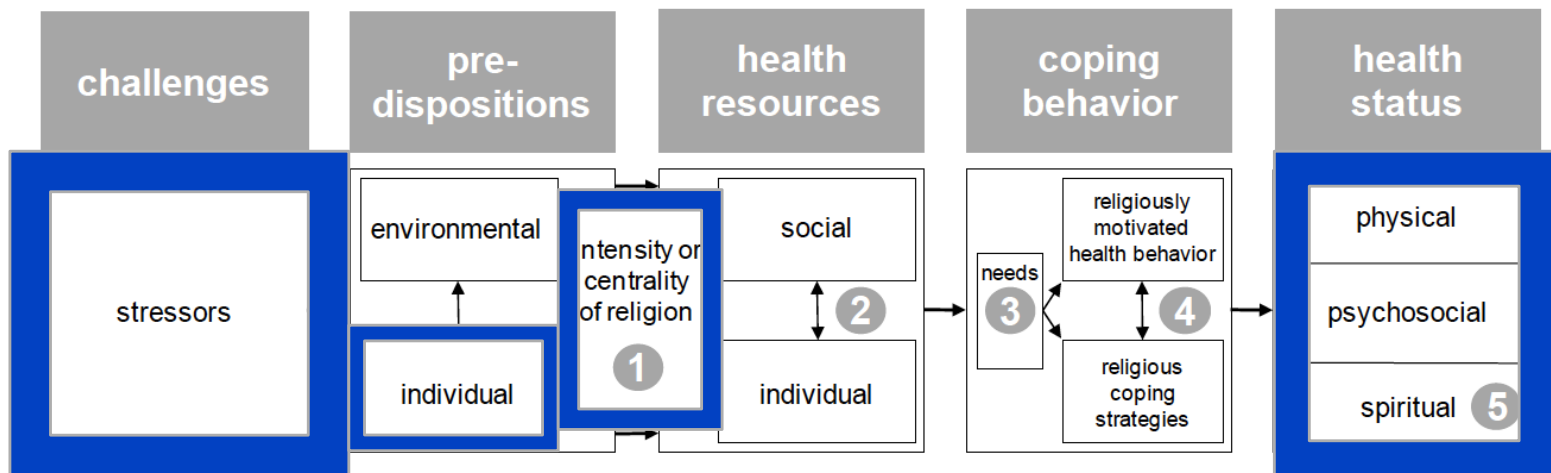
2. Examine Spiritual and Religious Practice Associations with Symptoms of Dementia Progression

3. Potential Mechanisms





# VULNERABILITY STRESS MODEL + SPIRITUALITY/RELIGIOSITY



Framework

(Zwingmann et al., 2011)



## Identify Ways to Support Spirituality

### Methods

To explore

- Spiritual and religious practices for coping with stress in caregivers and older adults with dementia
- How these practices help

Descriptive Qualitative Study using directed content analysis

Semi-structured telephone interviews October 2020 – May 2021 (COVID-19)



## Identify Ways to Support Spirituality

### Setting & Sample

- ❖ Conducted in Central Texas
- ❖ N = 11 (caregivers of older adults with dementia living in the home or in nursing homes)
- ❖ Mean age 63.82 (14.2) years
- ❖ 81.8% female, 64% retired
- ❖ 90% White, 10% Asian American



## Identify Ways to Support Spirituality

### Results

“If he’s getting anxious or antsy and he’s already been out on a walk and stuff and we’ll put on a service [*religious or spiritual service*] for him and it kind of helps him calm down, sit down and listen. And then he’s out of that anxious mood”

“He enjoys being able to watch the stuff online [*religious or spiritual service*]...Yeah, I mean, he’s just been a very strong believer his whole life and it’s almost feelings of that come over him when he is watching that. And he will start to almost like sometimes he starts to remember things.”

“Prayer helps me to get centered and focused.”



## Spiritual and Religious Practices Identified

Caregivers	Older Adults with Dementia
<ul style="list-style-type: none"><li>• Meditation</li><li>• Yoga</li><li>• Prayer, chanting</li><li>• Religious services</li><li>• Worship/music</li><li>• Holy Communion</li></ul>	<ul style="list-style-type: none"><li>• Prayer</li><li>• Religious services</li><li>• Worship/music (audio, video)</li><li>• Using sacred objects (crucifix, Rosary, prayer books)</li><li>• Reading sacred texts</li></ul>
<p>64% older adults with dementia &amp; 100% caregivers identified as a spiritual or religious person</p>	



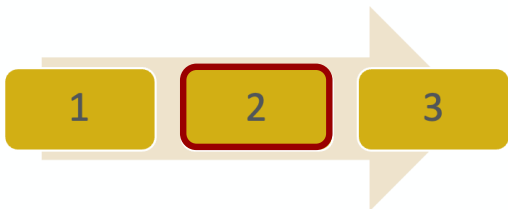


## How Practices Helped

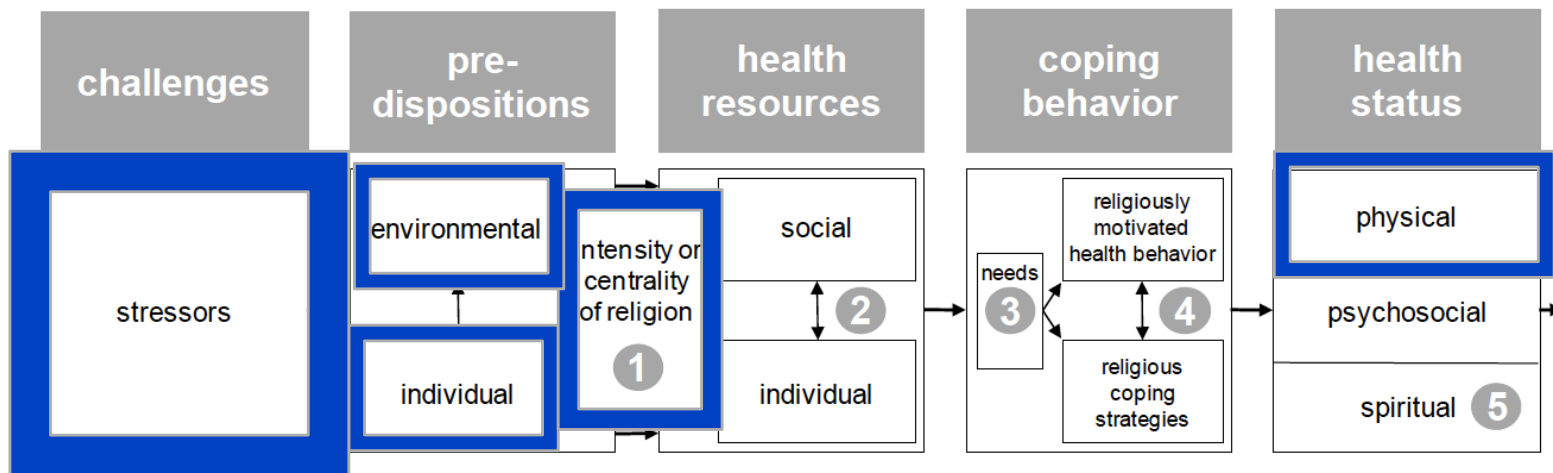
Caregivers	Older Adults with Dementia
<ul style="list-style-type: none"><li>• Calming</li><li>• Mindfulness</li><li>• Sleep</li><li>• Security – sense of control</li></ul>	<ul style="list-style-type: none"><li>• Decreased anxiety</li><li>• Calming</li><li>• Improved Mood</li><li>• Cognitive stimulation</li><li>• Prompted memories</li></ul>







# VULNERABILITY STRESS MODEL + SPIRITUALITY/RELIGIOSITY



Framework

(Zwingmann et al., 2011)

## Practice Associations with Cognition

### Methods

To examine

- Associations of spiritual and religious practices with cognition, neuropsychiatric/behavioral symptoms (NPS), and sleep disturbances in MCI & dementia

Secondary Data Analysis

- Health and Retirement Study (HRS)
- Aging Demographics and Memory Study (ADAMS)
  
- Spearman's Rho partial correlation, Wilcoxin, controlling for social interaction



# Practice Associations with Dementia Symptoms

## Sample

	N	Religious Attendance	Private Prayer	Neuropsychiatric Symptoms	Cognitive Function	Sleep Disturbance
<b>In Dementia</b>		HRS 2000, 2006, 2008		ADAMS 2001-03, 2006-07, 2008-09		
Sample A	72	⊗		⊗	⊗	⊗
Sample B	41		⊗	⊗	⊗	⊗
<b>In MCI</b>		HRS 2008		ADAMS 2008-09		
Sample C	63	⊗		⊗	⊗	⊗

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Age	73-100 years range
Education	9.84-10.26 range
Income	\$20602.00-27626.86 range
Cognitive Function	1.169/1.169/T1 0.94, T2 0.90
NPS	4.87/5.22/T1 1.56, T2 1.83
Sleep Disturbances	0.71/0.79/T1 0.54, T2 0.82
Race/Ethnicity	65.9-76.5% Non-Hispanic White
	19.8-22.1% Non-Hispanic Black
	0-2.1% Non-Hispanic Other
	3.7-9.9% Hispanic
Female	50.1-74.9%
Community Living	86.6-97.4%
Married, Partnered	33.2-42.7%

T1=time point 1; T2= time point 2

	White	Black	Hispanic	Other
Spirituality & Religion Very Important	59-62%	87-96%	100%	100%
R Attendance ≥ once weekly	42-55%	37-34%	67-71%	100%
Pray Privately ≥ once weekly	88%	100%	100%	-



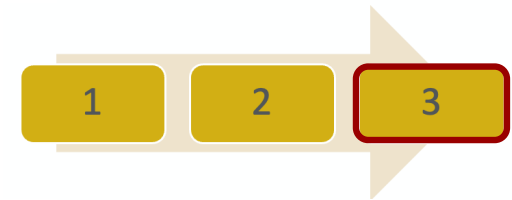
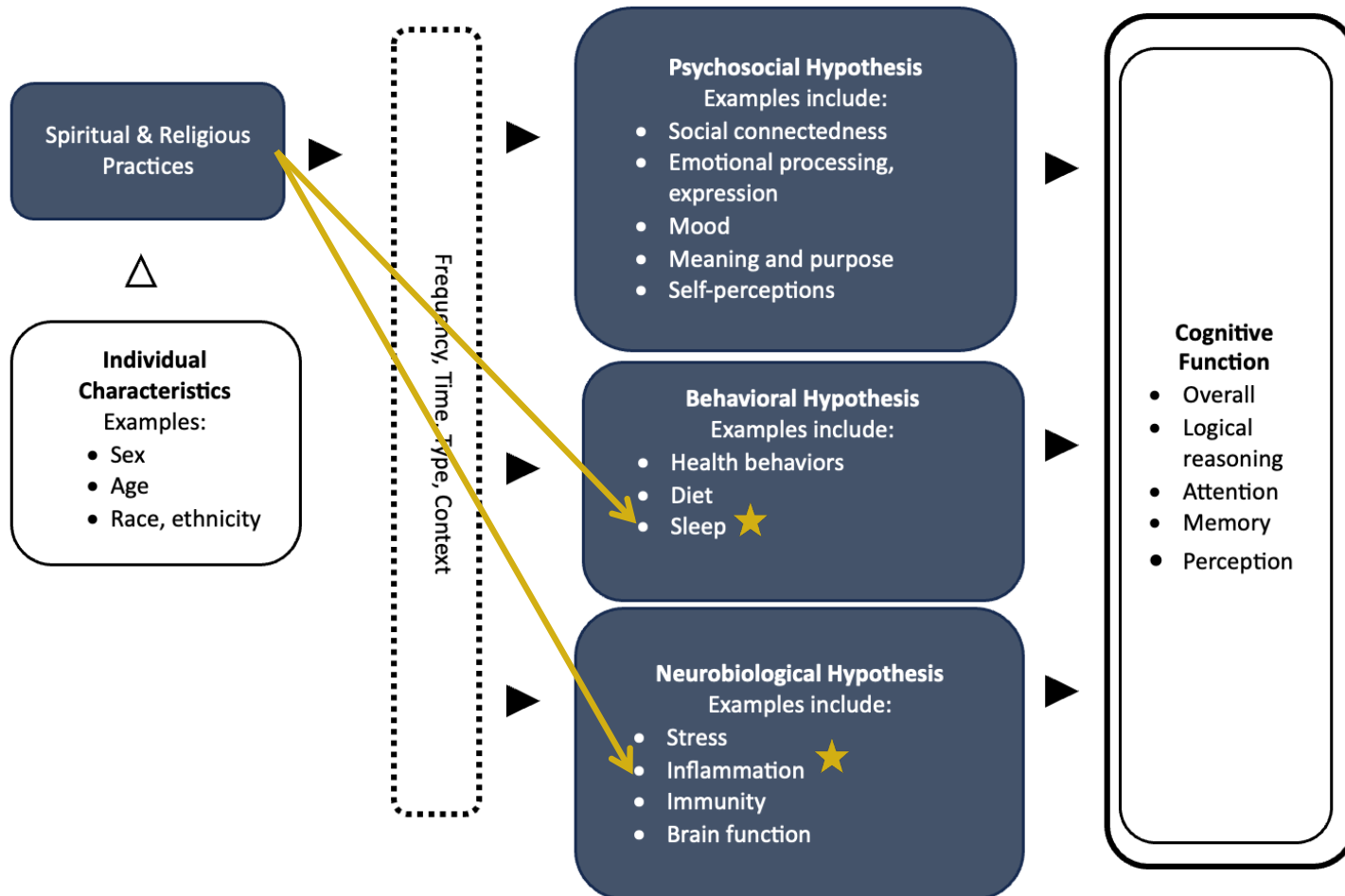
## Practice Associations with NPS, Cognitive Function, & Sleep Results



Predictor	Controlled For	NPS	Cognitive Function	Sleep Disturbance
	Variable	r	r	r
<b>Religious Attendance (N = 72)</b>				
Sample A in dementia	<i>Social interaction</i>	-.124 <i>p</i> <0.0005	-.018 <i>p</i> <0.001	-.275 <i>p</i> <0.0005
<b>Private Prayer (N = 40)</b>				
Sample B in dementia		-.358 <i>p</i> <0.01	-.383 <i>p</i> <0.01	-.147 <i>p</i> <0.01
<b>Religious Attendance (N = 63)</b>				
Sample C in MCI	<i>Social interaction</i>	-.243 <i>p</i> <0.0005	-.104 <i>p</i> <0.0005	-.051 <i>p</i> <0.001



## Postdoctoral Work



## Potential Mechanisms



## Postdoctoral Work


Dimensions of Religion & Spirituality	Methods & Variables	Findings
<p><b>Religious service attendance</b></p>	<ul style="list-style-type: none"> <li>• <b>Sleep</b> quality (Pittsburgh Sleep Quality Index (PSQI))</li> <li>• Midlife in the United States (MIDUS)</li> <li>• <i>N=1,158</i></li> <li>• 3 age groups: Early (&lt;45), Middle (45-64), and Late (&gt;65)</li> <li>• ANCOVAS</li> <li>• Covariates: sex, education, marital status, BMI, smoking, depression (CESD), anxiety (social anxiety scale), chronic condition</li> </ul>	<p>(older) <math>B= -0.89, p=0.02</math></p> <p><b>Higher religious attendance associated with better sleep quality in older adults</b></p> <p>(young) <math>B= -0.30, p=0.449</math>            (middle) <math>B= -0.21, p=0.439</math></p>
<p><b>Daily Spiritual Experiences</b> 5 items</p>	<ul style="list-style-type: none"> <li>• <b>Sleep</b> quality (PSQI)</li> <li>• MIDUS</li> <li>• <i>N=1,158</i></li> <li>• 3 age groups: Early (&lt;45), Middle (45-64), and Late (&gt;65)</li> <li>• ANCOVAS</li> <li>• Covariates: sex, race, education, marital status, BMI, smoking, chronic condition</li> </ul>	<p>(young) <math>B=-0.14, p=0.035</math>            (middle) <math>B= -0.10, p=0.026</math></p> <p><b>Higher daily spiritual experiences associated with better sleep quality in young and middle-age adults</b></p> <p>(older) <math>B= -0.12, p=0.090</math></p>

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**Association of  
Dimensions of Religion &  
Spirituality  
with Inflammation  
In Middle to Older Adults in the US**





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*No disclosures to declare*



# Background

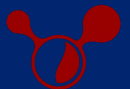


## Religion & spirituality associations

- Reduced risk mortality, morbidity, & better cognitive function
- Better physical health
  - Cardiovascular disease, stroke, hypertension, cholesterol, depression

## Mechanism unclear

- Positive psychological emotions
- Stress, depression, anxiety reduction
- Reduced engagement of risky behaviors (alcohol, drug use, tobacco)



# Background



Long-term exposure to chronic inflammation --> poorer health outcomes

Systemic inflammation associated with

- increased mortality
- morbidity in cardiovascular disease, hypertension, stroke
- depression
- risk of cognitive decline & dementia

(Avan et al., 2018; Hegazi et al., 2022; Kohler-Forsberg et al., 2017 ; Lewis & Knight, 2021; Li et al., 2017; Sesso et al., 2003), 2021



# Background



Limited studies, mechanism unclear

## Aim

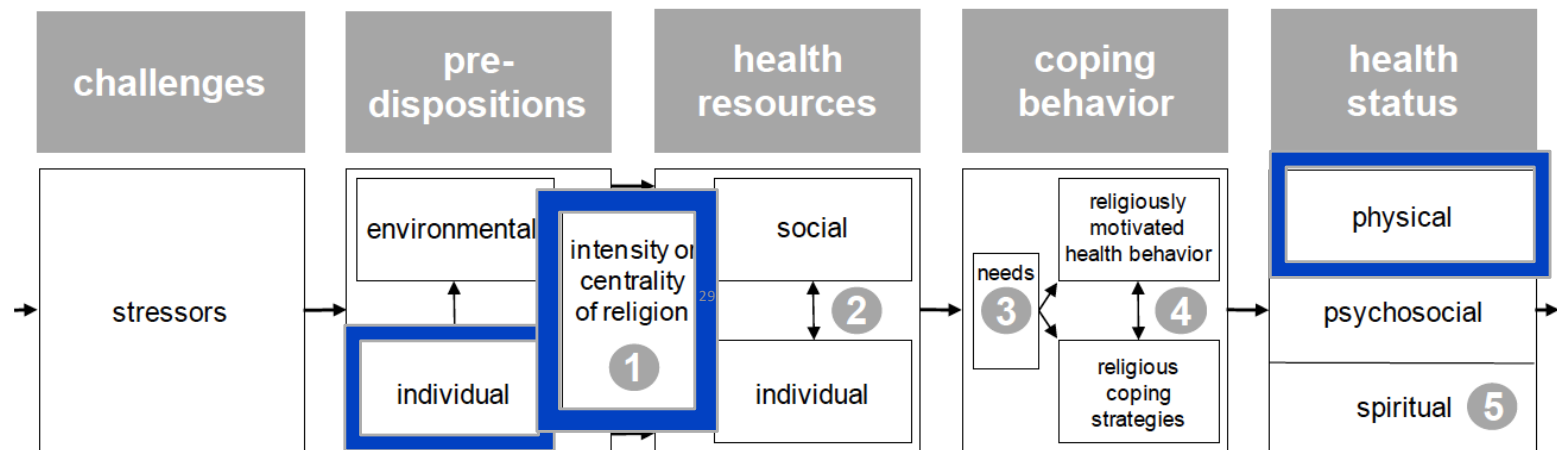
- 2 dimensions of religion and spirituality & markers of inflammation (e.g. CRP)
- longitudinally over 8 years
- Nationally representative data



# VULNERABILITY STRESS MODEL

+

# SPIRITUALITY/RELIGIOSITY



Framework

(Zwingmann et al., 2011)



# Methods

## Health & Retirement Study (2006-2014)

- **US adults aged 50 years +**
- **Religiosity/Spirituality** – beliefs, meaning, values
  - 4 items (Brief Multidimensional Measure of Religiosity/Spirituality), ( $\alpha$  0.93)
- **Religious Service Attendance** – frequency of attending religious services over the past year
- **CRP** - *ug/mL*

# Methods – Statistical Analysis



N=6,652

- Generalized estimating equation (GEE)
- HRS 2006, 2010, 2014

Control for

- Age, sex, education, marital status, race/ethnicity, income, BMI, health conditions (DM, cancer, HTN)



# Findings – Sample Descriptives

Mean age 70.7 (9.32) years; [range 52-104]

Education 13.158 (2.842) years

84.4% White

58.4% Female

64% married

Household Income 72,929.84 (114,278.60)





Findings –  
Sample  
Descriptives

Variable	Mean (SD)	Range [min-max]
C-Reactive Protein	3.846 (7.852)	0.015-280
Religious Attendance		
Low	0.484	0-1
High	0.516	0-1
Religiosity/Spirituality	17.465 (6.005)	2-24



## Findings: Religiosity/Spirituality & CRP



CRP	Coefficients	Confidence Interval	P-values
R/S	-0.040	[-.071, -.009]	0.012
Age	-0.268*	[-0.501,-0.036]	0.024
Age squared	0.002*	[0.0002,0.0034]	0.029
Female	0.731***	[0.347,1.120]	0.000
<i>Race (base: White/Caucasian)</i>			
Black/African American	1.476***	[0.783,2.169]	0.000
Other	-0.326	[-1.169,0.518]	0.449
Years of Education	-0.145***	[-0.211,-0.078]	0.000
Married	-0.065	[-0.439,0.308]	0.731
Household income	-0.190**	[-0.319,-0.060]	0.004
Hypertension	0.575**	[0.211,0.939]	0.002
Diabetes	0.473*	[0.071,0.874]	0.021
Cancer	0.723**	[0.190,1.256]	0.008
BMI (Overweight/Obese)	1.339***	[1.007,1.671]	0.000
<i>Year (base: 2006)</i>			
2010	-0.474**	[-0.778,-0.171]	0.002
2014	-0.601***	[-0.929,-0.273]	0.000
Constant	14.19***	[6.744,21.64]	0.000
Wald Chi2	246.70***		

95% confidence intervals in brackets

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$



## Findings: Religious Attendance & CRP



CRP	Coefficients	Confidence Interval	P-values
Religious Service Attendance			
<i>High</i>	-0.394*	[-0.758,-0.030]	0.034
Age	-0.301*	[-0.532,-0.070]	0.011
Age squared	0.002*	[0.0004,0.0037]	0.014
Female	0.709***	[0.319,1.010]	0.000
<i>Race (base: White/Caucasian)</i>			
Black/African American	1.492***	[0.790,2.194]	0.000
Other	-0.349	[-1.191,0.493]	0.416
Years of Education	-0.137***	[-0.204,-0.070]	0.000
Married	-0.052	[-0.431,0.328]	0.790
Household income	-0.187**	[-0.315,-0.059]	0.004
Hypertension	0.558**	[0.191,0.924]	0.003
Diabetes	0.449*	[0.050,0.848]	0.027
Cancer	0.715**	[0.183,1.248]	0.009
BMI (Overweight/Obese)	1.314***	[0.985,1.642]	0.000
<i>Year (base: 2006)</i>			
2010	-0.474**	[-0.778,-0.171]	0.002
2014	-0.601***	[-0.929,-0.273]	0.000
Constant	14.19***	[6.744,21.64]	0.000
Wald Chi2	259.28***		

95% confidence intervals in brackets

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$





## Findings

Variable	Coefficients	Confidence Interval	P-values
Religiosity/ Spirituality	-0.040	[-0.071, -0.009]	0.012
Religious Attendance	-0.394	[-0.758, -0.030]	0.034

Adjusting for age, sex, education, marital status, race/ethnicity, income, BMI, & health conditions



# Findings

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↑ religious service attendance  
& religiosity/spirituality = ↓ CRP

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↑ income, education = ↓ CRP

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Female, Black/African American  
participants, diabetes, cancer,  
hypertension, BMI = ↑ CRP



# Discussion



## Psychoneuroimmunology (PNI) theory

- Psychological stress → trigger cytokine release, inflammation (CRP)
- Chronic stress & negative emotions [depression and anxiety] → pro-inflammatory immune pathways
- Happiness & optimism → lower CRP

## Religion & Spirituality

- Higher psychological well-being
- Life satisfaction, happiness
- Control, hope, optimism
- coping mechanisms (+ and - ) for stress
- Social support, resources



# Discussion

Possible mechanism? religious service attendance & religiosity/spirituality and cognitive health → reduced systemic inflammation



Interventions incorporating dimensions of religion and spiritual support for adults who find religion/spirituality important could support better health



But more research needed:

Mediating role of inflammation between  
RS & CRP

Change in inflammation over time



# Strengths & Limitations



2 measures of  
Religion &  
Spirituality

Large sample size

Future: prayer,  
meditation,  
meaning &  
purpose

Self-reported  
measures







## Aging & Mental Health



ISSN: (Print) (Online) Journal homepage: [www.tandfonline.com/journals/camh20](http://www.tandfonline.com/journals/camh20)

# The association between religious beliefs and values with inflammation among Middle-age and older adults

Katherine Carroll Britt, Augustine C.O. Boateng, Joshua Sebu, Hayoung Oh, Ruby Lekwauwa, Lauren Massimo & Benjamin Doolittle



# Summary

- Spiritual and religious practices supporting spirituality in dementia:
  - Prayer, meditation, religious attendance, worship/music
  - Decreased anxiety, calmed them, improved mood, cognitive stimulation, prompted memories
- Spiritual and religious practices = better cognitive function & fewer NPS & sleep disturbances in MCI & dementia
- Higher frequency spiritual and religious practices in historically underrepresented participants with MCI & dementia
- Potential mechanism of better sleep [R/S focus may differ across age groups]
- Potential mechanism of reduced systemic inflammation
- Longitudinal and meditation studies needed



FEATURED ARTICLE | [Open Access](#) | 

## C-reactive protein levels and risk of dementia—Observational and genetic studies of 111,242 individuals from the general population

Sharif H. Hegazy, Jesper Qvist Thomassen, Ida Juul Rasmussen, Børge G. Nordestgaard, Anne Tybjærg-Hansen, Ruth Frikke-Schmidt 

First published: 03 February 2022 | <https://doi.org/10.1002/alz.12568> | Citations: 15

### JOURNAL ARTICLE

## Longitudinal associations between C-reactive protein and cognitive performance in normative cognitive ageing and dementia

Nathan A Lewis , Jamie E Knight

*Age and Ageing*, Volume 50, Issue 6, November 2021, Pages 2199–2205,  
<https://doi.org/10.1093/ageing/afab152>

Published: 29 July 2021 [Article history](#) ▼

Article | [Open access](#) | Published: 28 March 2024

## Serum high-sensitivity C-reactive protein and dementia in a community-dwelling Japanese older population (JPSC-AD)

Ayumi Tachibana, Jun-ichi Iga , Tomoki Ozaki, Taku Yoshida, Yuta Yoshino, Hideaki Shimizu, Takaaki Mori, Yoshihiko Furuta, Mao Shibata, Tomoyuki Ohara, Jun Hata, Yasuyuki Taki, Tatsuya Mikami, Tetsuya Maeda, Kenjiro Ono, Masaru Mimura, Kenji Nakashima, Minoru Takebayashi, Toshiharu Ninomiya, Shu-ichi Ueno & [the JPSC-AD study group](#)

*Scientific Reports* 14, Article number: 7374 (2024) | [Cite this article](#)

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The Rita **Hillman**  
and Alex **Foundation**



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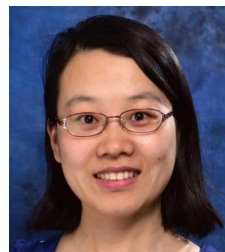


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# Questions?



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