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Research Article

Church Attendance associated with Healthier Life Choices

Maribeth Porter[1]*, Vanessa A Diaz[2], Jennifer Gavin[2] and Eric Matheson[2]

[1]*Department of Community Health and Family Medicine, University of Florida*
[2]*Department of Family Medicine, Medical University of South Carolina*

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***Corresponding author**

Maribeth Porter, Department of Community Health and Family Medicine, University of Florida, PO Box 100237, Gainesville, FL 32610, USA, Tel: (352) 273-5976; Fax: (352) 273-5213; Email: maribethporter@ufl.edu

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Abstract

Purpose: Studies have shown an inverse relationship between religiosity and unhealthy lifestyle behaviors. Tobacco and alcohol use is higher among the impoverished. The purpose of this study was to determine if frequent church attendance was associated with lower rates of smoking and alcohol use in adults living below the poverty threshold.

Methods: A secondary analysis of data from the 2005-2008 National Health and Nutrition Examination Survey was assessed. 6219 adults (≥ 40 years), representative of 121.8 million non-institutionalized adults in the United States, were included in the study. Logistic regressions predicting excess alcohol consumption, binge drinking, and current smoking were performed using church attendance as a covariate while controlling for age, gender, race, marital status, education, health, and poverty level.

Results: The sample included 20.1% current smokers and 25.7% excessive alcohol consumers. Individuals who did not attend church and were below the poverty line were more likely to be current smokers (OR: 3.45; 95%CI 2.56-4.64) when compared to those who attended church and lived above the poverty line. Those who did not attend church were more likely to binge drink regardless of poverty level (OR 1.64, 1.02-2.65). When predicting excessive alcohol consumption, only those who did not go to church and lived above the poverty level were more likely to drink (OR 1.24, 1.02-1.49). Those who attended church and were impoverished were actually less likely to consume excessive alcohol (OR 0.74, 0.56-0.97) when compared to the referent group of church attendees who were not impoverished.

Conclusions: Church attendance was associated with healthier lifestyle choices regardless of poverty level. It is unclear as to whether church attendance itself impacts lifestyle choices or perhaps masks another unknown variable. While the results did not differ much based on poverty level, church may be a resource available for individuals that health care providers can utilize.

Introduction

Religiosity has been associated with decreased mortality rates [1]. Approximately 83% of Americans self-identified with some form of organized religion in 2013 and almost 60% reported membership in a church or synagogue [2]. While there has been some shifting of denomination allegiance as well as decrease in the frequency of weekly church attendance, it still seems that a large portion of the US population considers itself religious [1,3].

Initial studies examining the impact of religiosity on health compared various religions and/or denominations, but more recent research has measured the impact of frequency (generally once per week versus more or less) of attendance at religious services on health outcomes [4]. One longitudinal study spanning almost three decades found lower mortality rates among frequent (once per week or more) religious attendees[4]. Perhaps some of the mortality benefits might be explained by religiosity being associated with healthier lifestyle choices. Studies have consistently seen lower rates of smoking and excessive alcohol intake among those who frequent religious services [5].

According to data from the Centers for Disease Control (CDC), over 46 million Americans or approximately 15% of the United States population was living in poverty between 2010-2012 with the majority being either black/African American or Hispanic/Latino [6]. Epidemiologic studies have consistently shown greater morbidity and mortality among those in poverty [7,8]. While lifestyle behaviors have not been shown to account for the full healthcare disparity, they likely play a key role [7]. The smoking prevalence in the United States continues to be the highest among those with a lower Social Economic Status (SES) [6]. Conversely alcohol use trends have not been as clear or linear. When considering both sexes, a higher percentage of those with an income 4 times or more above the poverty level binge drink when compared to those below the poverty level [6]. Excessive drinking was also greater among those with an income 400% or more above the poverty level [6].

While healthier lifestyle choices have been seen in frequent attenders of religious services, it is unclear whether that trend still exists when examining impoverished adults. Thus the aim of this study is to evaluate the association between church attendance, poverty status, and health behaviors in a nationally representative sample.

Methods

Design

Data from the 2005-2008 National Health and Nutrition Examination Survey (NHANES) was used in this study [9]. NHANES provides information on a nationally representative sample of United States non-institutionalized adults using a complex, multistage probability sampling design. It is a program of the National Center for Health Statistics (NCHS), which is part of the Centers for Disease Control and Prevention (CDC). This unique survey combines results from questionnaires, physical exams, and laboratory tests. For 2007-2008 non-Hispanic black persons, Hispanic persons, low-income white individuals, and those aged 80 and over were oversampled in order to increase the reliability and precision of estimates of health status indicators for these minority subgroups.

Sample

This study included 6219 individuals, representative of 121.8 million U.S. adults, aged 40 years and older. The sample was limited to this age group due to church attendance questions from the social support questionnaire only being asked of adults 40 years and older.

Demographics

The following demographic characteristics were assessed: age, gender, race, education level, health status, marital status, and poverty level. Race was separated into four groups: non-Hispanic white, non-Hispanic black, Hispanic, and other. Education level was dichotomized into "Less than a high school degree" and "High school degree or higher". Health status was grouped as "Excellent/Very Good/Good" and "Fair/Poor". Marital status was divided into two categories: married/living with partner or widowed/separated/divorced/never married. Lastly, poverty level was determined using the poverty income level, or ratio of family income to poverty threshold, as determined by the NHANES [10].

Church Attendance

Individuals were asked, "How often do you attend church or religious services?" Respondents were asked to provide a number that reflected the number of times they attended per year. For the purposes of this study, the following categories were created for church attendance: Never attends church (0 times); sometimes attends church (1-51 times); frequently attends church (52+ times). These categories were chosen based on previous studies comparing church attendance with other variables. Individuals who "sometimes" attend church average less than once a week, whereas those who "frequently" attend church average once a week or more.

Tobacco Use

Tobacco use was determined using the question "Have you smoked more than 100 cigarettes in your entire life?" Those who responded "No" were considered "non-smoker". Those who responded "Yes" were then asked "Do you now smoke cigarettes?" Participants were then categorized as either a "current smoker" or "former smoker." For the purposes of this study, participants were considered either current smokers or non-smokers, which could include former smokers.

Alcohol Consumption

Alcohol consumption was assessed in two ways: excessive drinking and binge drinking. For the former, men were considered to drink moderately if they consumed two or fewer drinks per day and to drink excessively if they consumed three or more drinks per day. Women were considered moderate drinkers if they consumed one or fewer drinks per day, and exceeded moderation if they drank two or more drinks per day. For binge drinking, men were considered to binge drink if they consumed more than 5 drinks at one time, and women were considered to binge drink if they consumed more than 4 drinks at one time.

Church Attendance and Poverty Level Variable

A four-part variable was created to determine if church attendance and poverty level were additive. If the associations were additive, those

Table 1: Lifestyle Habits, Poverty and Church Attendance.

		Church Attendance			
	Total N=6219	Never N=2273	Sometimes N=1676	Frequent N=2270	P-value
Age (mean)		56.2	55.3	59.1	<.0001
Gender					<.0001
Male	47.0%	52.2%	49.6%	39.8%	
Female	53.0%	47.8%	50.4%	60.2%	
Race					<.0001
Non-Hispanic White	76.5%	81.2%	72.9%	74.3%	
Non-Hispanic Black	10.2%	5.8%	12.3%	13.1%	
Hispanic	8.6%	7.8%	9.3%	9.0%	
Other	4.7%	5.2%	5.5%	3.5%	
Health status					<.0001
Excellent/Very Good/Good	80.3%	76.8%	81.7%	82.8%	
Fair/Poor	19.7%	23.2%	18.3%	17.2%	
Education					<.0001
Less than HS degree	18.9%	22.0%	16.4%	17.7%	
HS degree or more	81.1%	78.0%	83.6%	82.3%	
Marital Status					<.0001
Married/Living with Partner	68.0%	63.4%	68.6%	72.1%	
Not Married	32.0%	36.6%	31.4%	27.9%	
Smoking status					<.0001
Non-smoker	48.9%	38.2%	49.7%	58.9%	
Former Smoker	31.0%	32.2%	29.1%	31.2%	
Current Smoker	20.1%	29.6%	21.1%	9.9%	
Alcohol – Excessive					<.0001
Does not drink alcohol	28.6%	20.9%	22.8%	40.6%	
Moderate Consumption	45.8%	48.1%	45.8%	43.3%	
Exceeds Moderate	25.6%	30.9%	31.4%	16.2%	
Alcohol - Bingeing					<.0001
Does not drink alcohol	28.6%	20.9%	22.8%	40.6%	
Does Not Binge Drink	64.6%	68.6%	70.1%	56.5%	
Binge Drinks	6.8%	10.5%	7.1%	2.9%	

Table 2: Lifestyle Habits and Poverty.

		Poverty		P-value
	Total N=6219	Impoverished N=919	Non-Impoverished N=5300	
Church Attendance				<.0001
Never	36.5%	39.1%	36.1%	
Sometimes	27.0%	26.7%	27.0%	
Frequent	36.5%	34.2%	36.9%	
Smoking status				<.0001
Non-smoker	48.9%	43.3%	49.8%	
Former Smoker	31.0%	25.9%	31.9%	
Current Smoker	20.1%	30.8%	18.3%	
Alcohol – Excessive				<.0001
Does not drink alcohol	28.6%	35.5%	27.4%	
Moderate Consumption	45.7%	40.8%	46.6%	
Exceeds Moderate	25.7%	23.7%	26.0%	
Alcohol - Bingeing				<.0001
Does not drink alcohol	28.6%	35.5%	27.4%	
Does Not Binge Drink	64.6%	54.9%	66.3%	
Binge Drinks	6.8%	9.6%	6.3%	

who attended church and were non-impoverished would be expected to have the most optimal lifestyle behaviors, while those who did not attend church and were impoverished would be expected to have the worst lifestyle behaviors. Thus, respondents were categorized into the following groups: attends church and non-impoverished; no church and non-impoverished; no church and impoverished; attends church and impoverished.

Analysis

All analyses were completed using SAS 9.4 (SAS Institute Inc., Cary, NC). Bivariate analyses and chi-squared tests were performed to examine the association between church attendance, demographics and lifestyle habits. Additionally, the association between poverty and lifestyle habits was assessed. Logistic regressions predicting smoking, excessive alcohol intake, and binge drinking stratified by poverty level were adjusted for age, gender, race, marital status, education, and health status. Another logistic regression predicting the same lifestyle variables used the four-part variable that combined church attendance and poverty to determine if there was an additive effect. This study met the criteria for "Not Human Research" set forth by the Code of Federal Regulations (45CFR46) and therefore was not subject to oversight by the Medical University of South Carolina Institutional Review Board.

Results

Frequent church attendees (Table 1) were older, more often female, and reported their health as excellent, very good, or good. Non-Hispanic blacks were more likely to attend church frequently as well as those married or living with a partner. Individuals who never attended church were more likely to be current smokers and binge drink. Those with a high school degree or more reported attending church sometimes or frequently while those with less than a high school degree were more likely to never attend church. Impoverished individuals (Table 2) were more likely to never attend church, currently smoke, and binge drink when compared to those living above the poverty line. Yet those above the poverty line were more likely to drink excessively.

Table 3: Logistic Regression predicting lifestyle habits among church goers stratified by poverty level.

Predicted Variable	Covariate	Total Population OR (95% CI)	Impoverished Population OR (95% CI)	Non-impoverished Population OR (95% CI)
Excess Alcohol Consumption	Church Attendance			
	Never	1.73 (1.41 – 2.13)	2.10 (1.33 – 3.31)	1.69 (1.34 – 2.12)
	Sometimes	1.94 (1.57 – 2.40)	2.30 (1.41 – 3.73)	1.90 (1.50 - 2.40)
	Frequent	1.00	1.00	1.00
Alcohol – Binge Drinking	Church Attendance			
	Never	2.31 (1.58 – 3.39)	2.20 (1.11 – 4.35)	2.33 (1.49 – 3.64)
	Sometimes	1.62 (1.07 – 2.44)	1.96 (0.99 – 3.86)	1.54 (0.95 – 2.51)
	Frequent	1.00	1.00	1.00
Current Smoker	Church Attendance			
	Never	2.80 (2.23 – 3.52)	3.02 (2.00 – 4.57)	2.75 (2.10 – 3.60)
	Sometimes	1.88 (1.47 – 2.39)	1.79 (1.11 – 2.87)	1.89 (1.43 – 2.51)
	Frequent	1.00	1.00	1.00

Variables controlled for include age, gender, race, marital status, education, and health status.

Logistic regressions (Table 3) controlling for age, gender, race, marital status, education and reported health found individuals who sometimes attended church or never attended church were more likely to be current smokers (OR 1.88, 1.47-2.39 and OR 2.80, 2.23-3.52) regardless of poverty level when compared to frequent church attendees. A similar dose response relationship was found with binge drinking. When compared with frequent church attendees, those who sometimes attended were more likely to binge drink (OR 1.62, 1.07-2.44) as well as those who never attended church (OR 2.31, 1.58-3.39). Individuals who either sometimes or never attended church were more likely to report excessive alcohol consumption, regardless of poverty level.

In order to determine whether the effect of church attendance and poverty level were additive, logistic regressions with a four part variable (Table 4) combining church attendance and poverty were done. The four groups were those who attended church (sometimes or frequent) and were impoverished, no church and not impoverished, no church and impoverished, and attended church and not impoverished. Those who did not attend church were more likely to binge drink regardless of poverty level (OR 1.64, 1.02-2.65). Individuals who attended church and were impoverished as well as the group who did not attend church and were not impoverished were more likely to be current smokers (OR 1.60, 1.21-2.11). Those who did not attend church and lived below the poverty line were more likely to be current smokers (OR 3.45, 2.56-4.64) when compared to those who attend church and live above the poverty line. When predicting excessive alcohol consumption, only those who did not go to church and lived above the poverty level were more likely to drink (OR 1.24, 1.02-1.49). Those who attended church and were impoverished were

Table 4: Logistic Regressions predicting lifestyle habits among church goers living above and below the poverty line.

Predicted Variable	Church-Poverty Interaction Term	Total Population OR (95% CI)
Excess Alcohol Consumption	Attends Church and Impoverished	0.74 (0.56 – 0.97)
	No Church and Not Impoverished	1.24 (1.02 – 1.49)
	No Church and Impoverished	0.87 (0.64 – 1.19)
	Attends Church and Not Impoverished	1.00
Alcohol – Binge Drinking	Attends Church and Impoverished	1.20 (0.81 – 1.77)
	No Church and Not Impoverished	1.84 (1.33 – 2.54)
	No Church and Impoverished	1.64 (1.02 – 2.65)
	Attends Church and Not Impoverished	1.00
Current Smoker	Attends Church and Impoverished	1.60 (1.21 – 2.11)
	No Church and Not Impoverished	1.96 (1.59 – 2.41)
	No Church and Impoverished	3.45 (2.56 – 4.64)
	Attends Church and Not Impoverished	1.00

Variables controlled for include age, gender, race, marital status, education, and health status.

actually less likely to consume excessive alcohol (OR 0.74, 0.56-0.97) when compared to the referent group of church attendees who were not impoverished.

Discussion

This study suggests that church attendance may have a positive influence on healthy lifestyle behaviors such as smoking and alcohol consumption although no causal relationship can be made. Similar results have been seen in other studies. One pilot study of adults found that 78% of those surveyed felt using spiritual resources for tobacco cessation might be helpful and 77% were open to their providers encouraging the use of spiritual resources during quit attempts [11]. Another study following older adults found that those who attended religious services or participated in activities such as prayer or Bible study were less likely to smoke [12]. If they were smokers, they smoked fewer cigarettes per day when compared to less religious older adults [12]. A recent pilot survey exploring religious associations and tobacco dependence among adults found that nonsmokers, when compared to smokers, were more likely to participate in religious activities such as weekly church attendance, prayer, and Bible study. Of the smokers, 16% reported spiritual stress due to their smoking habits [13]. Similar results were seen in the Third National Health and Nutrition Examination Survey (NHANES III), which found frequent religious attendees smoked about 1-5 fewer cigarettes per day compared to infrequent attendees [14].

Binge drinking was more likely to occur in those who did not attend church, regardless of poverty level suggesting church attendance may have a positive effect on this health behavior as well. Excessive alcohol consumption was only found to be significantly associated with the variable of non-church attendance and impoverished. Those who attended church and were impoverished were significantly less likely to consume excess alcohol when compared with churchgoers living above the poverty line. This suggests the different patterns of alcohol use be evaluated separately in future studies.

There are several limitations to this study. The data set from NHANES is cross-sectional which prohibits the ability to make causal inferences. This study is unable to determine whether those who do not smoke or binge drink are simply more likely to attend church or whether church actually provides a positive influence on lifestyle choices. Further investigation into the influence of church attendance should consider whether those who smoke and binge drink are more likely to change lifestyle behaviors if they become church attendees. The data used in this study was based on self-reporting, which always has potential for bias. Our analyses only included adults 40 years and older as this was the age group asked about church attendance, therefore this study cannot offer insight into church attendance and lifestyle behaviors of those younger than 40.

This study suggests that church might serve as an important social support network for individuals and could have a positive influence on lifestyle choices, regardless of poverty level. Based on this study, it is unclear as to whether church attendance itself impacts lifestyle choices or perhaps masks another unknown variable. Yet when trying to encourage healthy lifestyle behaviors, this may be a resource available for individuals who attend church that health care providers can utilize or promote. While the results did not differ much based on poverty level, it may be especially helpful in the impoverished population due to other limited resources.

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