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Christian Health Internalization Scale: Initial Validation

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Abstract

The primary purpose of this exploratory research was to seek initial validation of a measure for use in the Christian population, the Christian Health Internalization Scale (CHIS)—providing a specific, theoretically-supported measure help further our understanding of *why* certain health behaviors might become internalized into religious values, but not others (particularly related to chronic disease prevention). Findings provide initial support for the validity of CHIS and provide an option for researchers and practitioners who desire to assess how well a health behavior is internalized into one's Christian values and identity, variation across populations, and/or for determining the effectiveness of interventions aimed at enhancing internalization.

While the positive link between religion and physical health is well-established (Vanderweele, 2017; Koenig, VanderWeele, & Peteet, 2023), the impact of individual religious beliefs, values, and participation on health behavior is less clear (Chen & VanderWeele, 2020). On the one hand, religious beliefs can positively impact health behavior, such as the Christian belief that the body is God's temple, motivating regulation of unhealthy use of tobacco, smoking, alcohol, or drug-related behavior (Faries, McClendon, & Jones, 2017). On the other hand, Christian churches often host events and activities that offer high-fat, high-sugar, and processed foods, snacks, and desserts while making few, if any, efforts to serve healthy foods (Kegler et al., 2012; Opalinski Parra & Gropper, 2019; Roozen, 2010).

The role of religion in influencing health behaviors is of particular interest in the prevention of chronic diseases. Chronic disease accounts for most of the leading causes of death in the US, yet nearly 80% is preventable with healthy lifestyles (Ford et al., 2009; McGinnis & Foege, 1993; Mokdad et al., 2004) emphasized by a majority of American adults (80%) who have self-reported to identify with a religious affiliation (70% Christian) (Pew Research Center, 2018). However, while a relationship emerges between religiosity and certain chronic disease-related risk behaviors, such as alcohol and smoking (e.g., Kim et al., 2003; Reeves et al., 2012), other behaviors, such as (un)healthy eating and physical (in)activity, can remain disconnected from religious consideration (Faries, Green, & Green, 2023).

Faries and colleagues (2023) introduced a novel concept of Christian health internalization to provide insight into why and how certain health behaviors are identified with, accepted, or incorporated into one's Christian values and identity consistent with Self-Determination Theory that posits the degree of motivation to regulate behavior for an outcome is dependent on how internalized the behavior is into one's sense of self (Ryan & Deci, 2000). Using Pew Research Center survey data, a minority of self-reported Christians (16%) had internalized a healthy lifestyle (i.e., those who believed that a healthy lifestyle, characterized by eating right and exercising regularly, was "essential" to what being a Christian or Catholic meant to them). These findings provide initial theoretical support for the notion that certain health behaviors may be internalized while others may not. However, this research was limited by the use of secondary data analysis, which involved predetermined, unalterable questions and a lack of specific measures to assess internalization (Faries, Green, & Green, 2023).

Purpose

To further the understanding of why certain health behaviors may become internalized into religious values but not others (particularly those related to chronic disease prevention), a more specific measure of internalization is required. Thus, the primary purpose of this exploratory research was to seek initial validation of a

measure for use in the Christian population, the Christian Health Internalization Scale (CHIS), guided by the following research questions.

1. Does the CHIS have adequate construct validity?

2. Do self-professed Christians internalize certain health behaviors (i.e., avoiding smoking, illicit drugs, and drinking too much alcohol) to a higher degree than other health behaviors (i.e., being physically active, eating a healthy diet, and avoiding eating too much food)?

3. Does internalization of physical activity and healthy eating correlate with religious/spiritual beliefs, Christian values, health beliefs, and health behaviors?

Methods

Scale Construction

Initial scale construction was based on a review of relevant measures of internalization, mostly via measures derived from the Self-Determination Theory. Specifically, the wording of items was focused on assessing two types of behavioral regulation: identified regulation and integrated regulation. Identified regulation occurs when behavioral goals, extrinsic to the behavior itself, are perceived as personally relevant, meaningful, and valued. A more internalized behavior, integrated regulation occurs when behavioral goals are "fully assimilated to the self, which means they have been evaluated and brought into congruence with one's other values and needs" (Ryan & Deci, 2000; pg. 73).

Theoretically, integrated regulation is the best fit for wording items to assess if health behavior has been brought into congruence and fully assimilated into one's religious values, specifically Christian values, in the present study. Measures of integrated regulation and behavioral identity (e.g., exercise identity scale) often allow respondents to determine the truth of a statement regarding the essentiality, centrality, integration, or consistency of behavior with one's values, goals, and/or sense of self (e.g., Anderson & Cychosz, 1994; Li, 1999; McLachlan, Spray, & Hagger, 2011; Wilson & Muon, 2008; Wilson et al., 2006).

Thus, for consistency and by Likert scale construction guidelines (DeVellis, 2003), a declarative statement was chosen for respondents to consider regarding the various behaviors examined in this study. Various wording was examined, edited, and reviewed by other academic researchers with an interest in and experience with scale use, as well as a convenience sample of laypersons who represent a relevant population. The following statement was decided upon: "The following behaviors are an essential or central part of my Christian values."

As a starting point, a list of behaviors was chosen across two categories: (1) religious behaviors and (2) health behaviors. Religious behaviors were selected from common religious practices and included prayer, reading the Bible, sharing one's faith, attending religious services, and volunteering at church. Health behaviors were selected based on the connections described in the present Introduction and Faries et al. (2023) and included avoiding illicit drugs, limiting alcohol consumption, maintaining a healthy lifestyle, refraining from smoking, avoiding excessive food intake, adopting a balanced diet, and engaging in regular physical activity. The goal of this examination was to provide a starter list of examples of each category to test the theoretical connections rather than an attempt to test for or confirm a latent factor structure of the items.

Content Validity

To help establish the content validity of the CHIS, three experts outside the research team were contacted to provide a critique of the scale's content wording. All three provided feedback and confirmation. The first individual (academic faculty, researcher) who is familiar with the primary author's research, with decades of translational research in health behavior, provided a general theoretical perspective, advice on wording, and consideration of the role of internalization in the self-regulation of health behavior. The second individual (academic faculty, researcher) with expertise in scale development provided advanced insight into wording and construct validity concerns. The third individual (faculty, practitioner) is well-established in understanding and application of the Self-Determination Theory and was able to confirm theoretical support for the content validity.

Construct Validity

To provide preliminary support for the construct validity of the CHIS, two steps were taken, focusing on specific, hypothesized relationships with other validated measures.

Step 1: Demonstrate that religious behaviors behave as expected, in that religiosity items from the CHIS will correlate with other measures of religious behavior internalization (see Table 2) using Pearson correlation. This step provides construct validity to the question wording and item choice format.

Step 2: Confirm proposed linear relationships of health behaviors that have theoretically internalized into the Christian identity with self-reported behavior using Pearson correlation (see Table 2). Such confirmation provides construct validity that health behaviors relate to internalization as hypothesized and lends support to the ability of the scale to assess relationships in other behaviors that do not have an empirical foundation (i.e., avoiding eating too much food, avoiding too much inactivity, eating a healthy diet, living an active lifestyle).

Design and Procedures

This study employed a cross-sectional design. An online, anonymous survey (Qualtrics, LLC) was created using the CHIS, alongside additional measures and distribution as described below. Institutional Review Board (IRB) approval was obtained.

Participants

Participants were recruited to participate in an anonymous survey through online distribution, mainly social media (e.g., Facebook, Instagram) and email contact lists. The recruitment text emphasized that the anonymous survey sought Christian views on healthy lifestyles, and a voluntary incentive was provided for participants by entering them into a randomized drawing with no connection to their survey data (i.e., a drawing for a fitness tracker). The email content and social media post included the title, "What do Christians believe about healthy lifestyles?" followed by, "Your religious worldview impacts many areas of your life, but how does it affect your view of healthy lifestyles?" Potential participants were then provided with a survey link to complete a brief, anonymous survey on their views of health behaviors from a religious perspective. Active recruitment was completed by members of the research team, who shared through their accounts, as well as through the Well Church Initiative's Facebook page—an initiative within the Family & Community Health Unit that supports faith communities with health education and resources. No attempts were made to financially "boost" the social media posts, but posts were re-shared throughout a six-week recruitment period.

An IRB-approved 'information sheet' was provided preceding the survey. The inclusion criteria were self-reporting an age of 18 years or older. Exclusion criteria were anyone < 18 years of age and those opting out of survey participation. To maintain specificity to the CHIS wording, we focused recruitment efforts on self-reported Christians and confirmed recruitment through a single item within the survey, "Do you describe yourself as a Christian?" with a yes or no response. Participant descriptives are provided in Table 1.

Measures

Health Behaviors

Healthy Diet

Three dietary behaviors were assessed (Lotfield et al., 2013). For fruit and vegetable consumption, participants were asked, "How many total servings of fruit and/or vegetables did you eat yesterday? A serving would equal one medium apple, a handful of broccoli, or a cup of carrots." For sugar-sweetened beverages, "In general, how many 12-oz sugar-sweetened beverages (including soda and sweet tea, but not diet soda or seltzer) do you drink per day? For fast food restaurant use, "In general, how many times do you dine from a fast-food restaurant or chain, such as McDonald's, KFC, Taco Bell, or similar per week?" Response choices for each question were provided from 0 to 30 times.

Overeating

Overeating behavior was assessed by asking, "In the past week, did you ever eat too much?" (Pew Research Center, 2014). Response choices were no or yes.

Physical Activity

Moderate-to-vigorous (MV) physical activity (days) was assessed by a single item that asked, "In the past week, on how many days have you done a total of 30 minutes or more of physical activity, which was enough to raise your breathing rate? This may include sport, exercise, and brisk walking or cycling for recreation or to get to and from places, but should not include housework or physical activity that may be part of your job" (Milton, Bull, & Bauman, 2011; Wanner et al., 2014). Response choices were 0-7 days.

Alcohol Consumption

Alcohol consumption (days) was assessed using a single-item from the 2018 Behavioral Risk Factor Surveillance System (BRFSS; www.cdc.gov/brfss), which asked, "During the past 30 days, how many days did you have at least one drink of any alcoholic beverage, such as beer, wine, malt beverage or liquor?" Response choices were 0-30.

Smoking

Smoking (cigarettes/day) was assessed using a single-item from the 2014 and 2017 Behavioral Risk Factor Surveillance System (BRFSS; www.cdc.gov/brfss), which first asked, "Do you currently smoke cigarettes every day, some days, or not at all?" For those answering "every day" or "some days," they were asked, "If you do currently smoke, on average, when you smoke, how

many cigarettes do you usually smoke each day?" Responses were a number entered by participants.

Religious Behaviors

Religious behavior (i.e., reading the Bible, praying, and attending religious services) was assessed using the Duke University Religious Index (DUREL; Koenig, Parkerson, & Meador, 1997; Koenig & Büssing, 2010). The item for organizational religious activity was used to assess religious service attendance: "How often do you attend church or other religious meetings?" with the following response options (1 = never, 2 = once a year or less, 3 = a few times a year, 4 = a few times a month, 5 = once a week, 6 = more than once a week). The non-organizational religious activity question, "How often do you spend time in private religious activities, such as prayer, meditation, or Bible study?" was used to assess time spent in prayer and Bible study, with the following response options (1 = rarely or never, 2 = a few times a month, 3 = once a week, 4 = ≥ 2 times a week, 5 = daily, 6 = more than once a day.

Health Beliefs

The survey collected data on three essential questions regarding health beliefs that coincide with potential lifestyle risk factors for chronic disease: (1) Would you say that, in general, your health is? (2014 BRFSS; www.cdc.gov/brfss), (2) In general, how healthy is your overall diet? (Lotfield et al., 2015), and (3) In general, how physically active is your lifestyle? (guided by Lotfield et al., 2015). Responses were completed on a 5-point scale (1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent). In addition, participants were asked if they had ever been told by a doctor, nurse, or other health professional that they have one or more of a list of chronic health conditions, including hypertension, high blood cholesterol, coronary heart disease, stroke, etc. (see Table 1). Response options were 'yes,' 'no,' or 'don't know.'

Religion

Participants were asked, "Which of the following best describes your religion?" Fourteen responses were provided: Baptist, Catholic, Church of Christ, Episcopal, Latter-day Saints/Mormon, Lutheran, Methodist, Pentecostal, Presbyterian, Protestant, Seventh-Day Adventist, Non-Denominational, Other, and Non-Religious. Only one answer choice was allowed per participant.

Christian Values

For exploratory reasons, and with guidance from the Self-Determination Theory expert during construct validity, two items were added to assess self-reported (1) the importance of Christian values and (2) the connectedness of Christian and personal values. The purpose of including the two items was to describe the participant samples and introduce a potentially confounding variable to control for in any subsequent regression analysis. For importance, participants were asked, "How important are your Christian values to you?" The five response choices were: 1 = not important at all, 2 = slightly important, 3 = moderately important, 4 = very important, and 5 = extremely important. For connectedness, participants were provided with the statement, "My values and my Christian values are inseparable," and asked to choose from five response options (1 = completely untrue, 2 = mostly untrue, 3 = equally true and untrue, 4 = mostly true, 5 = completely true).

Results

Participants

After three separate, purposeful survey marketing efforts over six weeks, a final, responsive sample had leveled off at N = 271, representing the number of individuals who had attempted the survey. Fifty-two participants were deleted due to incomplete data (e.g., starting the survey but not completing it), resulting in a final sample of N = 219 examined in this study. Descriptive data for the sample are shown in Table 1. Participants, on average, also reported that Christian values are important to them (4.43 ± 0.73; 1-5 scale) and are inseparable from their values (4.00 ± 0.91, 1-5 scale).

Table 1
Participant Descriptives Represented as Means ± Standard Deviation (SD) and Frequency (%)

Variable	Result
Age (years)	32.93 ± 10.53
Body Mass Index (BMI; kg/m^2)	29.68 ± 7.05
Sex (%)	
Women	96.8%
Men	3.2%
Race (%)	
Black/African American	89.6%
White	7.6%
Other	1.9%
American Indian/Alaska Native	0.5%
Asian	0.5%
Religion (%)	
Non-Denominational	36.1%
Baptist	26.4%
Catholic	6.5%
Methodist	6.5%
Pentecostal	6.5%
Seventh-Day Adventist	3.7%
Church of Christ	3.7%
Other	10.6%
Health Status (% yes)[a]	
Depression	18.8%
Hypertension	16.1%
High Cholesterol	13.6%
Arthritis	6.6%
Diabetes	3.3%
Cancer	2.8%
Kidney Disease	2.3%
Coronary Heart Disease	1.0%
Stroke	0.5%
Skin Cancer	0.5%
Health Beliefs (1, poor to 5 excellent)	
General Health	3.35 ± 0.88
Overall Health of Diet	2.97 ± 0.84
Physical Activity of Lifestyle	2.69 ± 1.04

[a]Have you ever been told by a doctor, nurse or other health professional that you have:

Construct Validity

To establish initial construct validity, we proposed two steps, utilizing hypothesized correlations with other validated measures, which were both confirmed (Table 2). For Step 1, all relationships of CHIS religious items with religious behaviors (i.e., reading the Bible, prayer, and attending religious services) were confirmed, as hypothesized. The greater the internalization of three behaviors related to increased self-reported behavior, using a common, validated scale (i.e., DUREL). These results provide preliminary support for the validity of the question wording and item choice form, indicating that religious behaviors behave as expected, an important step in confirming that other behaviors are being assessed as intended. Step 2 confirmed the proposed relationships of two CHIS health behaviors with self-reported behavior. As hypothesized, the more internalized both avoiding smoking and drinking too much alcohol, the less of these behaviors were self-reported in cigarettes per day and days of drinking at least one alcoholic drink in the past 30 days, respectively (Table 2).

Internalization of Health Behaviors

To determine if self-professed Christians internalize certain health behaviors (i.e., avoiding smoking, illicit drugs, and drinking too much alcohol) to a higher degree than other health behaviors (i.e., being physically active, eating a healthy diet and avoiding eating too much food), the means and frequencies were examined across all CHIS items (Table 3). When examining the mean differences in the internalization of various behaviors, including health behaviors, there was little variation, with all means ranging from 3.56 to 4.74 on a 1-5 scale. These findings, examining only mean differences, do not appear to support our initial hypothesis.

However, there was interest in the variation of full internalization of behaviors, which, theoretically, would have the strongest influence on each respective behavior. Thus, the frequency (%) of participants who rated each behavior as ‘completely true' to be an essential or central part of their Christian values was also analyzed (Table 3). The more traditional religious behaviors ranked among the most internalized (i.e., prayer, 80.8%; reading the Bible, 54.1%; sharing my faith, 45.7%; attending religious services, 40.4%), followed by more traditionally internalized health behavior (i.e., avoiding drugs, 54.3%; avoiding too much alcohol, 48.8%; and avoiding smoking, 47.0%). The least internalized behaviors, as hypothesized, were eating a healthy diet (23.5%), being physically active (24.2%), avoiding overeating (32.0%), and maintaining a healthy lifestyle (32.0%).

Table 2
Proposed and Confirmed Linear Relationships and Direction of Religiosity Items from the Christian Health Internalization Scale (CHIS) with Other Measures of Religiosity, Religious Integrated Regulation, and Self-Reported Behavior

CHIS: Internalization	**Self-Reported Behavior**		**Identified Regulation[b]**	
	Proposed	Confirmed	Proposed	Confirmed
Reading the Bible[a]	+ (item #2)	0.32**	+ (sum score)	0.60**
Prayer[a]	+ (item #2)	0.33**	+ (sum score)	0.57**
Attending religious services[a]	+ (item #1)	0.70**	+ (sum score)	0.45**
Avoiding smoking	– (cigarettes/day)	-0.60**	+ (sum score)	0.30**
Avoiding drinking too much alcohol	– (days ≥ 1 drink)	-0.28**	+ (sum score)	0.42**

[a]Duke University Religion Index (Koenig & Büssing, 2010); [b]CRIS = Christian Religious Internalization Scale (Ryan, Rigby & King, 1993)
Note. '+' indicates a positive relationship; '–' indicates a negative relationship; $^{**}p \leq 0.01$

To further explore the ability of the CHIS to discern internalization, a secondary analysis was performed to examine differences in the frequency of responses (i.e., those answering "completely true" to behaviors being essential or a central part of their Christian values) between age groups and Christian denominations. Four age groups were examined (18-25, 26-35, 36-45, ≥ 46 years of age), revealing a general trend for a jump in internalization from the 26-35 to ≥ 36 age ranges for avoiding illicit drugs, avoiding drinking too much alcohol, avoiding tobacco smoking, with little to no difference between other health behaviors (Table 4).

Christian denominations were split into five groups (Baptist, Catholic, Seventh-Day Adventist, Non-Denominational, and Other). Despite a small sample size (n = 8), Seventh Day Adventists were selected as a group due to their known connection of healthy lifestyle and diet to their religious beliefs—"It also means that because our bodies are the temples of the Holy Spirit, we are to care for them intelligently. Along with adequate exercise and rest, we are to adopt the most healthful diet possible and abstain from the unclean foods identified in the Scriptures" (www.adventist.org/beliefs). Suppose the CHIS is sensitive to such perspectives. In that case, this Christian tradition should have a higher frequency of self-reporting health behaviors that are internalized into their Christian values, which was found (Table 5). Those self-reporting a Catholic affiliation generally reported the lowest frequency across all health behaviors compared to the other denominations, which trended similarly.

Table 3
Descriptives of Various Behaviors from the CHIS, Representing Internalization into One's Christian Values[a]

		CHIS Response Frequency (%)				
Behavior	Mean ± SD	Completely Untrue	Mostly Untrue	Equally True & Untrue	Mostly True	Completely True
Religious Behaviors						
Prayer	4.74 ± 0.61	0.5%	0.9%	3.7%	14.2%	80.8%
Reading the Bible	4.24 ± 1.04	2.8%	6.0%	10.1%	27.1%	54.1%
Sharing my faith	4.17 ± 0.94	1.8%	2.7%	17.8%	32.0%	45.7%
Attending religious services	3.98 ± 1.07	2.8%	6.9%	20.6%	29.4%	40.4%
Volunteering at church	3.56 ± 1.23	7.8%	11.9%	24.7%	27.9%	27.9%
Health Behaviors						
Avoiding the use of illicit drugs	4.06 ± 1.29	9.1%	4.6%	11.4%	20.5%	54.3%
Avoiding drinking too much alcohol	3.97 ± 1.27	6.9%	8.8%	13.4%	22.1%	48.8%
Living a healthy lifestyle	3.91 ± 0.94	0.9%	5.0%	28.3%	33.8%	32.0%
Avoiding tobacco smoking	3.88 ± 1.32	9.1%	7.3%	17.4%	19.2%	47.0%
Avoiding eating too much food	3.63 ± 1.26	8.2%	11.0%	22.4%	26.5%	32.0%
Eating a healthy diet	3.61 ± 1.11	5.5%	9.2%	27.2%	34.6%	23.5%
Being physically active	3.60 ± 1.09	4.6%	8.7%	32.9%	29.7%	24.2%

[a]Participants asked to respond to the statement: "The following behaviors are an essential or central part of my Christian values."

Table 4
Descriptives of Various Behaviors from the CHIS, Representing Internalization into One's Christian Values by the Frequency (%) of Those Answering "Completely True" Between Age Groups[a]

	Age Groups in Years (*n*)			
Behavior	18-25 (*44*)	26-35 (*113*)	36-45 (*30*)	≥ 46 (*28*)
Religious Behaviors				
Prayer	88.6%	78.9%	77.4%	82.1%
Reading the Bible	50.0%	50.4%	64.5%	64.3%
Sharing my faith	38.6%	45.6%	51.6%	50.0%
Attending religious services	45.5%	33.6%	54.8%	42.9%
Volunteering at church	25.0%	25.4%	45.2%	21.4%
Health Behaviors				
Avoiding the use of illicit drugs	50.0%	44.7%	77.4%	78.6%
Avoiding drinking too much alcohol	37.2%	42.1%	76.7%	67.9%
Living a healthy lifestyle	34.1%	27.2%	45.2%	35.7%
Avoiding tobacco smoking	40.9%	37.7%	74.2%	67.9%
Avoiding eating too much food	29.5%	28.9%	38.7%	42.9%
Eating a healthy diet	29.5%	21.2%	23.3%	25.0%
Being physically active	25.0%	21.1%	35.5%	25.0%
Other				
My body is a Temple of God	50.0%	49.6%	58.1%	53.6%

[a]Participants asked to respond to the statement: "The following behaviors are an essential or central part of my
Christian values."
[b]Those answering "Strongly Agree" to the statement: "My body is a temple of God."

Table 5
Descriptives of Various Behaviors from the CHIS, Representing Internalization into One's Christian Values by the Frequency (%) of Those Answering "Completely True" Between Christian Denominations[a]

	Denomination (*n*)				
Behavior	Baptist (57)	Catholic (*14*)	Seventh-Day Adventist (*8*)	Non-Denom (*78*)	All Other (*61*)
Religious Behaviors					
Prayer	82.5%	50.0%	100%	84.6%	79.0%
Reading the Bible	49.1%	21.4%	87.5%	64.1%	49.2%
Sharing my faith	49.1%	50.0%	62.5%	51.3%	40.3%
Attending religious services	36.8%	50.0%	37.5%	46.2%	34.4%
Volunteering at church	26.3%	35.7%	25.0%	28.2%	27.4%
Health Behaviors					
Avoiding the use of illicit drugs	57.9%	35.7%	75.0%	53.8%	53.2%
Avoiding drinking too much alcohol	50.9%	35.7%	75.0%	48.7%	46.7%
Living a healthy lifestyle	29.8%	28.6%	75.0%	33.3%	27.4%
Avoiding tobacco smoking	52.6%	21.4%	75.0%	43.6%	48.4%
Avoiding eating too much food	35.1%	21.4%	50.0%	34.6%	25.8%
Eating a healthy diet	28.1%	21.4%	62.5%	19.7%	19.4%
Being physically active	28.1%	28.6%	50.0%	19.2%	22.6%
Other					
My body is a Temple of God[b]	38.6%	57.1%	87.5%	56.4%	50.8%

[a]Participants asked to respond to the statement: "The following behaviors are an essential or central part of my Christian values."
[b]Those answering "Strongly Agree" to the statement: "My body is a temple of God."

With the preliminary construct validity of the CHIS established, the next step was to examine the relationship between the internalization of physical activity and healthy eating into one's Christian values, as well as self-reported beliefs and behaviors. Generally, non-significant to weak, significant relationships were found (Table 6). Internalization of eating a healthy diet was weakly correlated with times eating fast food in the past week ($r = -0.19$, $p < 0.05$) and the belief of the healthiness of one's diet (poor to excellent, $r = 0.20$, $p < 0.01$), but not significantly related to servings per day of fruit/vegetable ($r = 0.12$) or number of sugar-sweetened beverages per day ($r = 0.19$). The internalization of being physically active was significantly related to the belief regarding the physical activity component of one's lifestyle (poor to excellent, $r = 0.35$, $p < 0.01$) and physical activity behavior in the past week, specifically in days with ≥ 30 minutes of physical activity ($r = 0.29$, $p < 0.01$). Additionally, the internalization of living a healthy lifestyle was weakly correlated with the belief in one's health ($r = 0.16$, $p < 0.05$).

To further elucidate the effect, a dichotomous variable was created for each internalization item, operationalizing two groups: low internalization (scoring 1-3 on the 5-point scale) and high internalization (scoring 4-5 on the 5-point scale). To test for mean differences, independent t-tests were used, with Cohen's d calculated to determine the effect size. Small, medium, and large effect sizes were interpreted as $d = 0.20$, 0.50, 0.80, respectively. To examine the differences in frequencies of two items (i.e., the percentage of those who ate too much in the past week and those who binge ate in the past 3 months), a Pearson chi-square test was utilized, with rho (φ) reported for effect size. Small, medium, and large effect sizes were interpreted as $\varphi = 0.10$, 0.30, and 0.50, respectively.

The results, presented in Table 7, suggest a significantly stronger relationship between internalization and self-reported beliefs and behaviors across all CHIS behaviors. Specifically, those in the high internalization group had clinically and statistically significant differences in means on most items assessed compared to those in the low internalization group. In examining effect sizes, the internalization of religious behaviors, church attendance, prayer, and reading the Bible had large to moderate effects in the direction of greater behavior among those in the high internalization group. In health behaviors, moderate to large effects were observed for engaging in physical activity and abstaining from alcohol. In contrast, small to moderate effects were observed for self-reported subjective health, diet, fruit and vegetable consumption, and fast food intake—all of which indicated healthier behaviors among those in the high internalization group. Avoiding smoking had a strong effect size (a mean difference of more than 4 cigarettes per day). However, it was not statistically significant, likely due to the small sample size and high level of variance in the low internalization group.

Table 6
Results of Linear Correlation and Regressing Self-Reported Behaviors on Internalization of Each Behavior, Respectively

Internalization (X)[a]	Behavior (Y)	*r*	R^2	Y (X = 1)[d]
Prayer	Prayer (*how often, 1 to 6)*[b]	0.33**	0.11**	0.79 units
Reading the Bible	Reading the Bible (*how often, 1 to 6*)[b]	0.32**	0.10**	0.43 units
Attending Religious Services	Church attendance (*how often, 1 to 6*)[c]	0.70**	0.49**	0.80 units
Avoiding Drinking Too Much Alcohol	Alcohol (*days; ≥ 1 drink in past 30 days*)	-0.28**	0.08**	-1.00 days
Avoiding Smoking	Smoking (*cigarettes per day*)	-0.60**	0.37*	-1.71 cigarettes/day
Eating a Healthy Diet	Fruits/vegetables (*servings per day*)	0.12	0.02	-
Eating a Healthy Diet	Sugar-sweetened beverages (*# per day*)	0.19	0.00	-
Eating a Healthy Diet	Fast food (*times per week*)	-0.19*	0.03**	-0.31 times/week
Being Physically Active	Physical activity (*days; ≥ 30 min past week*)	0.29**	0.08**	0.50 days/week

[a]From the Christian Health Internalization Scale (CHIS), "The following behaviors are an *essential* or *central* part of my Christian values."
(1 = completely untrue to 5 = completely true)
[b]1 = rarely or never, 2 = a few times a month, 3 = once a week, 4 = ≥ 2 times a week, 5 = daily, 6 = more than once a day
[c]1 = never, 2 = once a year or less, 3 = a few times a year, 4 = a few times a month, 5 = once a week, 6 = more than once a week
[d]slope of regression (m)
*$p \leq 0.05$; **$p \leq 0.01$; *m* = slope of regression

Table 7
Mean Differences (or Frequencies) of Self-Reported Religious and Health Behaviors Between Groups of Low Versus High Internalization of Those Relative Behaviors

Behavior[a]	Low Internalization[b]	High Internalization[b]	*t* or χ^2	*d* or φ
Religious Behaviors				
Prayer (*how often, 1 to 6*)	2.80 ± 1.75	4.46 ± 1.33	-3.38**	1.07
Reading the Bible (*how often, 1 to 6*)	3.64 ± 1.61	4.56 ± 1.26	-3.35**	0.64
Church attendance (*how often, 1 to 6*)	3.22 ± 1.07	4.91 ± 0.88	-11.26**	1.73
Health Behaviors				
Alcohol (*days; ≥ 1 drink in past 30 days*)	4.67 ± 4.91	2.29 ± 4.30	3.47**	0.52
Smoking (*cigarettes per day*)	6.33 ± 5.23	2.00 ± 2.45	1.82	1.06
General health (*poor to excellent, 1 to 5*)	3.19 ± 0.92	3.44 ± 0.85	1.64*	0.28
Eat too much in the past week (*% yes*)	42.9%	35.9%	0.87	-0.07
A healthy diet (*poor to excellent, 1 to 5*)	2.77 ± 0.80	3.11 ± 0.84	-2.95**	0.42
Fruits/vegetables (*servings per day*)	1.84 ± 1.28	2.34 ± 1.53	-2.69**	0.35
Sugar-sweetened beverages (*# per day*)	0.56 ± 0.86	0.76 ± 1.40	-1.16	0.17
Fast food (*times per week*)	1.86 ± 1.95	1.32 ± 1.64	2.16*	0.30
Physical activity (*poor to excellent, 1 to 5*)	2.34 ± 0.90	2.99 ± 1.06	-4.83**	0.66
Physical activity (*days; ≥ 30 min past week*)	2.74 ± 1.56	3.79 ± 2.06	4.10**	0.57

[a]Behavior measures are detailed in the methods section
[b]Low versus high groups determined by response from each relative question within the Christian Health Internalization Scale (low = 1-3 out of 5; high = 4-5 out of 5)
*$p \leq 0.05$; **$p \leq 0.01$; *d* = Cohen's *d*

Discussion

The primary aim of this study was to establish preliminary construct validity for the Christian Health Internalization Scale (CHIS), which assesses variation in the internalization of religious and health behaviors into Christian values—a nascent theoretical concept (Faries, Green, & Green, 2023). For consistency with established theoretical conceptions of internalization, participants were provided with a statement, "The following behaviors are an essential or central part of my Christian values," and then asked to rate various religious and health behaviors on a scale of 1 (completely untrue) to 5 (completely true).

Construct Validity

The present findings support the preliminary construct validity of the CHIS (Table 2), confirming that the CHIS's religious items and health behavior items were positively correlated with their respective self-reported behaviors. As hypothesized, two health behaviors traditionally theorized to be internalized into Christian values, avoiding smoking and drinking too much alcohol, were both correlated with self-reported behavior. This confirmation provides confidence that the CHIS can be used to assess the perceived internalization of health behaviors into one's Christian values, allowing for the exploration of other health behaviors that have implications for chronic disease prevention and management.

Internalization of Health Behaviors

To this end, we examined the frequencies and correlations of internalization of eating a healthy diet or living a physically active lifestyle with one's self-reported behavior. Less than 25% of the sample self-reported a full internalization (choosing ‘completely true’) of eating a healthy diet and being physically active, being less frequently internalized than other health behaviors, such as avoiding the use of illicit drugs (54%), avoiding drinking too much alcohol (49%), avoiding tobacco smoking (47%), and more generally, living a healthy lifestyle (32%). These findings support previous findings of only 16% of a national sample internalizing the essentiality of living a healthy lifestyle through eating right and exercising regularly to being a Christian, as well as furthering support that certain health behaviors can be perceived as more fully internalized into religious values, in this case, Christianity, but not others (see Faries, Green, & Green, 2023).

As noted elsewhere, a common reason that a health behavior might be internalized as an essential or central part of Christian values is a result of a connection to an aspect of religious belief and/or praxis, such as the behavior(s) deemed a vice, work(s) of the flesh, sinful passions, and/or the common belief in avoiding behaviors that are perceived to destroy the body, believed to be God’s

temple (Faries et al., 2017). Historically, such a connection has been documented with tobacco smoking, drug abuse, and alcohol abuse across Christian denominations, and most particularly American Protestantism. However, the present findings support the hypothesized proposed disconnect between poor diet, physical inactivity, and obesity. One possibility of this disconnect is a lack of awareness of the tremendous impact and burden of certain health behaviors on the risk of disease, death, and premature death. Another possibility, although speculative, is that despite awareness of the negative impact, such behaviors might be kept from internalization so as not to challenge cultural traditions and/or inhibit pleasure experienced (e.g., eating unhealthful foods).

There has been much written on concerns related to self-indulgence, fleshly desires, carnal passions, and health-related vices (e.g., gluttony, greed, sensuality) within Christianity, as expressed by the authors of the Hebrew and New Testament Scriptures, as well as by the ancient Church (e.g., Apostolic and Church Fathers). However, not all Christian faith traditions and contemporary denominations adhere to a more orthodox understanding of the physical and spiritual implications of the body, behavior, and/or health. Yet, other traditions have utilized religious beliefs to inform practices that promote and support healthy lifestyles. Individuals who have adopted a healthy lifestyle have reported a lower frequency of overeating and a higher frequency of vigorous exercise compared to those in other groups (Faries, Green, & Green, 2023).

Such variation was supported in the present study, which compared differences in self-reported internalization among Christian denominations (Table 5). The CHIS was sensitive enough to detect, in comparison to other denominations, the hypothesized increase in the frequency of internalization of health behaviors among Seventh-Day Adventists, who are known to promote the integration of healthy lifestyles into their beliefs and practices. Interestingly, while those self-reporting a Baptist affiliation have historically been perceived as a Christian tradition that believes the body is God's temple with implications to avoiding common behaviors (e.g., tobacco smoking), the subsample in the present study had a relatively low frequency of internalization of these behaviors.

Limitations and Future Research

Several limitations should be noted. First, as a preliminary validation of the CHIS, the present sample using a self-reported, cross-sectional 'snapshot' analysis with a majority of younger adults (M = 33 years of age), women (97%) from Baptist and non-denominational Protestant traditions, and self-reporting Black/African American race (90%). While the sample was appropriate for providing initial validity of the CHIS, certain findings should be interpreted with this descriptive data in mind, and caution exercised against generalizability. However, with its initial validity confirmed, the CHIS can be used in larger, more diverse samples, as well as to understand the potential malleability of internalization over time.

To note, the relatively homogeneous sample was uniquely responsive to our online, social media-based approach. While such recruitment is intended to reach a broader, more diverse population, this goal was not achieved. It is possible that individual recruitment efforts from members of our research team were more effective in garnering the present sample. The research team has employed this same recruitment methodology in the past, producing samples with varying characteristics and demographics. In turn, these results support the effectiveness of common online recruitment methods through social media, yet reiterate concerns about reliability and variability. Thus, the generalizability of the results beyond the present sample should be cautioned, and future research with the CHIS across more heterogeneous samples (e.g., age groups, religions/faith traditions, denominations, geographic locations) is encouraged.

For the CHIS development and future use, a five-point scale was employed to enhance sensitivity and reliability. However, interpreting the results was challenging and limited when examining means or the distribution of frequencies, as it was paired with dichotomizing the CHIS responses into low and high internalization. When analyzed in this way (Table 5), a clearer effect emerged, further supporting the potential impact of internalizing behavior on actual behavior. Thus, it is possible that the internalization of behavior could be better elucidated when surpassing a threshold or impacted by moderators, which were unexplored in the present study. While the CHIS appears sensitive enough to assess internalization on a 1 to 5 scale, those looking to use it as a determinant of behavior might consider using a similar dichotomy analysis to express whether a person internalizes a specific behavior or not. This would also provide an important analysis for future research.

Regarding CHIS wording, consideration has been suggested for varying approach- versus avoidance-framed behaviors, as they are internalized differently. For example, the perceived centrality of ‘eating a healthy diet’ versus ‘avoiding eating an unhealthy diet’ may differ in one's religious values. Both types of motivation are represented in the Christian faith, often organized within the pursuit of virtue and avoidance of vice. In the present study, wording was chosen based on the most common ways the behaviors have traditionally been vocalized. Future research could investigate whether internalization varies by approach or avoidance perspectives and how each perspective can be more or less consistent with religious beliefs and practices.

Similarly, there is variation across Christian traditions and/or denominations in their view of the malleability of identity (a relatively modern and diffuse term related to one’s qualities or traits; e.g., Gleason, 1983), which could influence the perception of the need for more internalized forms of behavioral regulation. For example, avoiding vice and pursuing virtue might be more essential and central to the values of a Christian faith tradition where identity is malleable, at least to some degree, based on the way one conducts life (e.g., ongoing faithfulness, continual repentance, co-operating in God's grace, pursuing the

likeness of God by aligning one's behavior and lifestyle with that of Jesus Christ, working out one's salvation [Philippians 2:12], an understanding that people become like what they worship, and so on) versus a tradition with the view that their identity is set, and remains unaltered regardless if virtue/vice, good/bad, or healthful/unhealthful behaviors are chosen. Future research could examine such questions.

Conclusion

This exploratory research has provided initial support for the validity of the Christian Health Internalization Scale (CHIS). While further research is warranted to confirm and replicate this validity in larger samples, other populations, and religious traditions, the CHIS provides an option for researchers and practitioners who desire to assess how well a health behavior is internalized into one's Christian values and identity, variation across populations, and/or for determining the effectiveness of interventions aimed at enhancing internalization. The present findings also support the need for a measure, such as the CHIS, to assess the variation of internalization over time within a religious tradition, as well as across denominations with unique beliefs and practices despite being labeled as "Christian." Presumably, there would be similar variations across other religious traditions, opening an opportunity for future research using a religion-specific variation of the CHIS. The CHIS could also be used as an outcome measure to assess internalization changes from focused interventions—especially as little is still known about the process of internalization, how it can occur, if interventions can be effective in supporting the internalization of health behaviors into one's religious values and identity, and if such internalization relates to or predicts those same health behaviors.

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The authors declare that they have no conflicts of interest.

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