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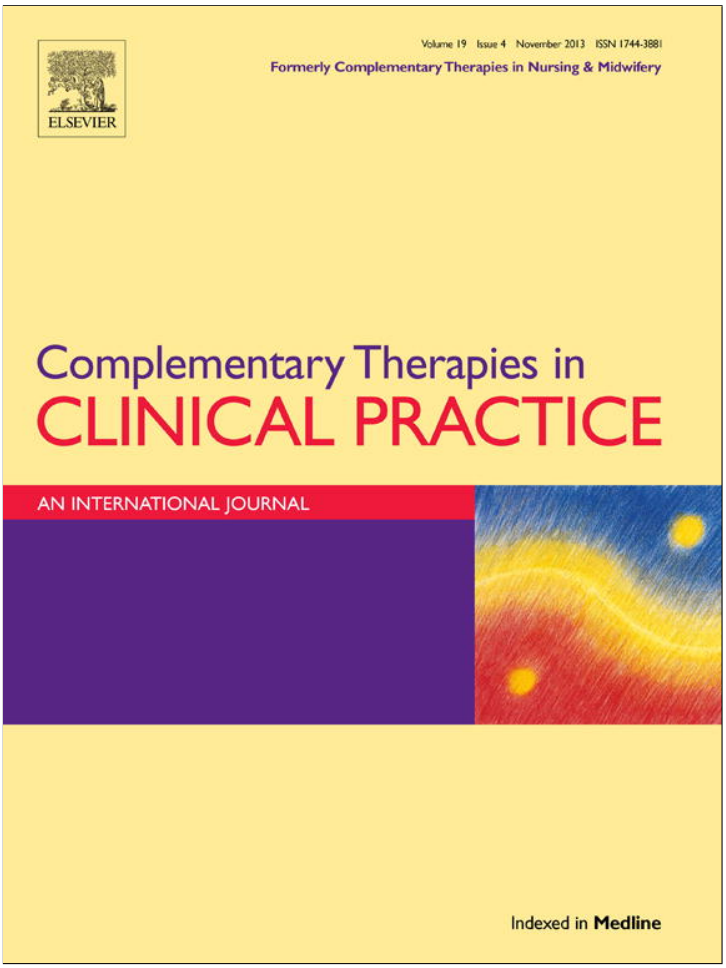

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Association of strength of religious adherence to quality of life measures

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A B S T R A C T

Purpose: The purpose of this study is to evaluate, in a mid-west, religiously conservative church-population, the impact upon a subject's Biblically based depth of religious adherence on quality of life.
Methods: A survey evaluating self-reported adherence to basic activities and knowledge of faith and perceived well-being. Subjects were divided into 'adherent' or 'less-adherent' and these groups were used to analyze differences.
Results: Of 303 included subjects we found differences between adherent and less-adherent groups in each of 7 questions ($P \leq 0.01$). The strongest separation between groups resulted from: if they met the needs of another Christian, studied the Holy Scriptures or praised God.
Conclusion: Religious adherence may promote a sense of well-being in those who profess Christian faith.
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1. Introduction

A growing number of studies suggest a connection between religion and spirituality to mental and physical health [1–3]. The medical literature has noted that church attendance, religious practices and spiritual beliefs may improve health and general well-being [4–7]. In addition, a number of community based surveys have demonstrated that individuals who attend religious services are happier and give their personal resources more generously [8,9].

Further, a recent study by Stewart and coworkers suggested, at least for the Christian faith, that religiously adherent glaucoma patients generally coped better with their disease and treatment, and they demonstrated a better quality of life than less-adherent patients [10]. However, little information is yet available which evaluates the depth of adherence to a religion and the extent of the derived benefit to personal well-being in a general (non-patient based) population.

The purpose of this study is to evaluate, in a mid-west, religiously conservative church-population, the impact upon a subject's Biblically based depth of religious adherence on quality of life.

2. Material & methods

2.1. Subjects

This study was a prospective survey analysis of a single church based cohort. The survey was performed during a single Sunday service on March 27, 2011 at the church directed by of one of the authors. The church, a Christian evangelical church, was selected because evangelical churches usually view religious adherence seriously and thus it provided a good field setting to correlate depth of adherence to well-being [11]. One service was chosen to administer the survey to assure that a subject did not inadvertently fill out a duplicate survey at a subsequent church event.

The survey evaluated self-reported adherence to Biblically based Christian religious practice, knowledge (Maturity Questions based on Christian Scripture [Acts 2:42–47, Ephesians 2:8–9, 1Peter 1:3–5]) and the perceived benefit derived from their religion regarding their personal well-being (Well-being Questions [Galatians 5:22, 1Timothy 6:6, Romans 8:1, Philippians 4:6–7, Hebrews 4:14–16, II Timothy 1:9]).

The survey was developed by one of the authors (WCS) based on the Biblical exhortations noted above and can be found online (Supplemental Material). Following initial development the survey was reviewed and revised by one author from a pastoral perspective (WRM) and by another author from a clinical regulatory perspective (JAS).

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2.2. Procedures

All adults (age ≥ 18) attending the chosen weekly service were asked to participate in this study following an explanation of its purpose. The survey then was distributed and collected during the service. No further attempt was made to encourage participation, or assure that all surveys were collected or completed.

Subjects excluded from this study were those who did not wish to participate, were unable to read and write English (and did not have someone to assist them), or could not cooperate or understand the questions due to cognitive skills. Subjects were instructed to take as much time as they needed to complete the survey. Subjects were not required to respond to every item.

Further, subjects were asked not to make any notations on the survey that would identify them and were assured their individual answers would not be viewed by church staff. Due to the non-interventional survey design of this study Institutional Review Board approval was not required, but no personal identification was collected and no medical or psychological based treatment was prescribed. The participants were not financially compensated for completing the survey.

Completed surveys were sent directly to the data analysis center and each survey was identified only by a number that could not be linked to the subject's identify.

2.3. Statistics

All statistical tests were non-paired, two-sided and used a *P*-value of 0.05. The sample population was not powered statistically for this study since this was a descriptive, non-comparative survey.

Survey questions were classified as follows: 'Religious Activity Questions' (Questions 8–13) and 'Knowledge Questions' (Questions 14–15). These eight questions together were designated as Maturity Questions designed to assess a subject's seriousness in practicing their religion.

In contrast, we included seven Well-being Questions which reflected the potential impact of the practice of the participant's religion on their personal life (Questions 1–7). Subjects were subdivided for each maturity question to 'adherent' or 'less adherent' to their religious practice. The 'adherent' level for all questions was arbitrarily placed at ≤ 1.0 on the visual analog scale (graded 0–6) which roughly divided the group into halves.

A one-way ANOVA was used to evaluate each response from the seven Well-being Questions based on whether they were adherent or less-adherent on each of eight Maturity Questions (56 separate evaluations) [12]. Because of the multiple analyses of the Well-being Questions we used a modified Bonferroni correction ($\alpha/5$) to adjust the *P*-value to declare significance [13]. We also evaluated the results by the number of subjects who answered any 2, 3, 4, 5, 6, 7 or 8 of the Maturity Questions as adherent or less adherent. A one-way ANOVA was used to evaluate between adherent and less-adherent responses for each Well-being Question [12].

We also performed a multi-variant linear regression analysis used to evaluate for statistical associations of religious adherence to the respondent's history as well as the Well-being Questions. Because of the multiple analyses of the multi-variant linear regression analysis we used a modified Bonferroni correction ($\alpha/5$) to adjust the *P*-value to declare significance [13].

3. Results

3.1. Subject characteristics

In total, 303 subjects participated in the survey. The subject characteristics are shown in Table 1. One subject was excluded for not completing more than 50% of questions and 18 subjects were excluded for not meeting the age requirements. Several subjects declined to fill out at least one item on the demographic portion of the history. The average survey scores for all subjects for each question are found in Tables 2 and 3.

Table 1
Respondent characteristics ($n = 303$).

Characteristic	Detail	Subjects	Percentage
Race	White	280	93%
	Asian	3	1%
	Hispanic	2	1%
	Other	15	5%
Gender	Female	162	54%
	Male	140	46%
Age	Mean ± standard deviation	45.3 ± 15.0	NA
Employment	Full-time employment	163	55%
	Full-time homemaker	36	12%
	Retired	32	11%
	Part-time employment	20	7%
	Student	20	7%
	Part-time homemaker/ employment	19	6%
	Other	7	2%

No question had answers from every respondent surveyed as they were not required to respond if they did not desire.

3.2. Well-being questions

When subjects were divided into adherent (0–1) and less adherent (>1) groups based on their responses to each of the Maturity Questions, we found a significant difference between groups, after the modified Bonferroni correction, for answers on each of the seven Well-being Questions ($P \leq 0.01$). The strongest separation between groups on the Well-being scales resulted generally from the questions: if they met the needs of another Christian, studied the Bible, or praised God.

When we elevated the criteria for 'adherence' by defining 'mature' as scoring 'adherent' on any two or more of the Maturity Questions, we found an increased statistical separation between adherent and less adherent individuals for each Well-being Question; especially for subjects scored as 'adherent' on ≥3 of the Maturity Questions, and those subjects who scored adherent ≥6 or more maturity questions. The Well-being scores most influenced by increasing maturity were a sense of: contentment, peace, purpose and acceptance by God. Average survey scores for subjects scoring as adherent on multiple Maturity Questions are found in Table 4.

3.3. Multi-variant linear regression analysis

The multi-variant linear regression analysis was used to evaluate statistical associations of religious adherence to the respondent's history as well as the Maturity Questions. This test

Table 2
Questions asked to subjects in order to determine religious adherence, extent of religious activity, knowledge and perceived benefit from their religious beliefs.

Survey questions	Subjects	Average score
1: I am content with life	300	1.8 ± 1.3
2: I have peace	299	1.8 ± 1.3
3: I am joyful	299	1.8 ± 1.3
4: I have purpose	300	1.6 ± 1.4
5: God cares about me	298	1.0 ± 1.5
6: I feel accepted by God	299	1.1 ± 1.6
7: I feel guilty	299	2.1 ± 1.6

No question had answers from every respondent surveyed as they were not required to respond if they did not desire. The maximum number could be 303. The average answer ± standard deviation for all subjects is shown on the right.

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Table 3
Questions asked to subjects in order to determine religious adherence, extent of religious activity, knowledge and perceived benefit from their religious beliefs.

Survey questions	Subjects	Choices	# of responses
8: I associate with other members of my faith	298	Every day	169
		Once/week	118
		Once/month	7
		Once/year	3
		Never	1
9: I meet the specific need of another Christian or the church body	269	Every day	78
		Once/week	109
		Once/month	67
		Once/year	15
10: I study the Holy Scriptures, either through personal study or through my religious congregation	285	Every day	122
		Once/week	135
		Once/month	21
		Once/year	6
		Never	1
11: I pray to God	297	Every day	268
		Once/week	23
		Once/month	6
12: I praise God	298	Every day	242
		Once/week	53
		Once/month	3
13: I teach others about the truths of my faith	281	Every day	152
		Once/week	85
		Once/month	33
		Once/year	9
		Never	2
14: When I die I will go to heaven	298	Yes God forgives me by faith…	280
		Other	18
15: I can lose my salvation due to	290	Nothing - salvation, once accepted by faith cannot be lost	226
		Other	47
		Not following scripture	17

No question had answers from every respondent surveyed as they were not required to respond if they did not desire. The maximum number could be 303.

found significant risk factors for adherence after the modified Bonferroni correction for both Asians and Hispanic populations ($P < 0.01$).

4. Discussion

The purpose of this study was to evaluate, in a mid-west, religiously conservative church-population, the impact upon a subject's Biblically based depth of religious adherence on quality of life. This study showed that subjects who were adherent to activities meant to create maturity in their Christian based faith (drawing encouragement from other church members, reading Scripture, prayer, praise, service, sharing faith and proper view of assured acceptance by God through faith), were associated generally with greater personal well-being. Greater well-being was manifested generally, after the modified Bonferroni correction, by

Table 4
Mean scores for Well-being questions for subjects who answered, any maturity questions between 0 and 1 (adherent score).

			Mean comfort scores						
Number of knowledge questions	Subjects	Response	I am content with life	I have peace	I am joyful	I have purpose	God cares about me	I feel accepted by God	I feel guilty
Any 2	16	Adherent	2.4	2.1	2.5	2.2	1.3	1.3	2.1
	12	Less adherent	2.8	3.0	2.8	3.1	2.4	2.8	3.1
P-value			*0.39*	*0.09*	*0.52*	*0.11*	*0.12*	*0.04*	*0.12*
Any 3	37	Adherent	1.9	2.0	1.9	1.8	1.0	1.2	2.7
	28	Less adherent	2.6	2.5	2.6	2.6	1.8	1.9	2.5
P-value			*0.05*	*0.17*	*0.02*	*0.01*	*0.03*	*0.04*	*0.61*
Any 4	44	Adherent	2.1	2.2	2.3	2.0	1.3	1.4	2.0
	65	Less adherent	2.2	2.2	2.2	2.1	1.3	1.5	2.6
P-value			*0.85*	*0.86*	*0.73*	*0.72*	*0.99*	*0.89*	*0.02*
Any 5	60	Adherent	1.8	1.8	1.9	1.8	1.0	1.1	2.1
	109	Less adherent	2.2	2.2	2.3	2.1	1.3	1.5	2.4
P-value			*0.06*	*0.09*	*0.10*	*0.22*	*0.22*	*0.17*	*0.19*
Any 6	62	Adherent	1.5	1.6	1.6	1.3	0.6	0.7	1.9
	169	Less adherent	2.0	2.1	2.1	2.0	1.2	1.3	2.3
P-value			*0.009*	*0.02*	*0.007*	*0.001*	*0.008*	*0.005*	*0.19*
Any 7	41	Adherent	1.4	1.5	1.5	1.3	0.9	1.2	2.1
	231	Less adherent	1.9	1.9	2.0	1.8	1.0	1.2	2.2
P-value			*0.04*	*0.03*	*0.02*	*0.05*	*0.66*	*0.87*	*0.71*
All 8	31	Adherent	1.1	1.3	1.3	0.8	0.3	0.3	1.1
	272	Less adherent	1.8	1.9	1.9	1.7	1.0	1.2	2.2
P-value			*0.005*	*0.01*	*0.01*	*0.0004*	*0.02*	*0.003*	*0.0006*

The table shows the scores for each Comfort question based on the number of Knowledge questions for which a patient was classified as 'adherent'.

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answers to each of the seven Well-being Questions ($P \leq 0.01$). The strongest separation between groups on the Well-being scales resulted generally from the questions: if they met the needs of another Christian, studied the Holy Scriptures, or praised God.

When the findings were analyzed by assessing those subjects who were classified as 'adherent' on multiple Maturity Questions, a further separation between groups on the Well-being Questions was shown with $\geq$ any 3 of these questions classified as adherent and especially those adherent on $\geq$6 questions. These findings indicate that a subject might perceive greater personal well-being from even a partial adherence to the basic tenets of their faith. However, the more serious a person was about the practice of their religion, the greater sense of well-being they might have derived.

The general findings of high well-being scores in this survey are consistent with the medical literature that show religious people generally are happier [1–4]. However, no direct comparison to a non-religious group was performed in this study.

Further, this current study is consistent with the authors' prior study in glaucoma patients in which they found a further benefit to the subject's sense of well-being in subjects more active and knowledgeable about their religion [10]. However, it adds to the literature in that it demonstrates an improved sense of well-being in non-patient based subjects who showed at least some adherence to their faith as well as a progressive benefit with greater adherence.

These findings may appear contradictory to some evidence which indicates that negative religious experiences in systemically ill patients were associated with poorer health outcomes [14,15]. These negative experiences were noted as dealing with God's vengeance or punishment or suffering religious struggles, such as feeling unloved by God and spiritual discontent [16]. As a religion, Christian Scriptures teach that a believer should not feel guilty, fear condemnation or feel unloved because their acceptance by God is based on faith and not conduct (Heb 4:14–16, I Jn 4:19, John 5:24, Romans 8:1). The impact of this teaching was evidenced in our study in that subjects who felt most guilty were less adherent or knowledgeable about their faith.

The results in this study are important clinically because, although a physician or therapist may not often be aware of patient's religious beliefs, becoming acquainted with their spiritual beliefs might help medical personnel better know how to assist these individuals in coping with problems in general (well-being, guilt, or fearing God as mentioned above). For such a patient claiming to be non- or marginally adherent to their religion, the physician or therapist may have some confidence that this individual might better cope emotionally by greater adherence. Further, the realization that an individual's church community or pastor could act as a resource to help them cope, in providing social support, might give the practitioner an additional option to assist an emotionally troubled individual. In addition, if a patient indicates they are not religious, but suffers poor well-being, the physician, if appropriate, could engage a local church as a community resource to help provide emotional support for the individual.

Although our non-Caucasian subject population was small, the association of adherence of Hispanics to religious adherence on the multi-variant linear regression analysis might have clinical importance. Some information has linked worse adherence to asthma and diabetes treatment in Hispanics [17,18]. A community resource such as a church, where this population might have a greater tendency to show adherence to principles of faith, might be useful to transfer this concept to treatment as well.

This study suggests that religious adherence may promote a sense of well-being in those who profess Christian faith. Further, a person may report better well-being with only a beginning adherence to religious practice but may gain a greater benefit by a fuller adherence and understanding of the faith.

This study did not evaluate the long-term impact of religion/spirituality on a person's life or well-being. Also, it did not assess the actual use of religion/spirituality in physician or therapist counseling to assist a patient coping with life stresses or in improving adherence to clinical disease regimens. Further, this study only evaluated Christian subjects within a limited geographic and social environment. The literature regarding adherence to a person's faith and well-being is Christian and American in nature. Few non-Christian studies about which we are aware address this topic. Inozu and coworkers found that highly religious Christians demonstrated less obsessive behavior than highly religious Muslims although neither group had anxious or depressive symptoms [19]. However, more data are still needed from other major religions (e.g., Judaism, Islam and Hinduism) as well as different denominations and among various Christian demographic communities to determine if similar findings are found in these faiths and groups.

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Conflict of interest statement

None of the authors have any proprietary interests or conflicts of interest related to this submission.

Appendix A. Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.ctcp.2013.05.001.

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