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The Effects of Centering Prayer on Well-Being in a Sample of Undergraduate Students: A Pilot Study

Alejandro Eros¹ · Thomas G. Plante¹ 

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Abstract

Contemplative practices have likely been used for self-awareness, concentration, creativity, and well-being since the dawn of time. While practices such as yoga and Buddhist meditation have been extensively studied in recent decades, Christian contemplative practices have received less attention in empirical research. This study aims to investigate the effects of centering prayer, a Christian contemplative practice, on mental health and well-being. The research focuses on college students enrolled in a religious studies course that incorporates centering prayer into the curriculum. It is a pilot study because it is the first to explore centering prayer in an undergraduate setting. Using a comparison group from another religious studies course, the study examines whether practicing centering prayer regularly for seven weeks can lead to changes in anxiety, stress, depression, mindfulness, satisfaction with life, hope, and compassion as assessed by multiple questionnaires. Additionally, the study explores whether religiosity influences the impact of centering prayer on these variables. Participants were recruited through their course enrollment, and data was collected through online surveys administered at three time points during the study. Multivariate analyses of covariance indicated trends suggesting that centering prayer may contribute to decreased anxiety and increased hope and compassion. However, no significant changes in these outcomes were observed ($p > .05$). The study highlights the potential therapeutic benefits of centering prayer and the need for further research on Christian contemplative practices.

Keywords Contemplative practice · Centering prayer · Mindfulness · Christianity · Mental health · Well-being

People have used contemplative practices to nurture self-awareness, direct concentration, increase creativity, and grow in mindfulness for thousands of years. Well-established practices such as yoga and Buddhist meditation date back at least as early as 300 BCE, almost certainly much earlier, although the origins of yoga have been the subject of some controversy (Jain, 2014; Powers, 2008). Contemplative practices can also be found in Judaism in the form of *kabbalah*, with roots dating back to the third century CE, in Christianity in

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the form of *lectio divina* and centering prayer, dated as late as the sixth century CE, and in Islam in the form of *tawhid*, which is dated as late as the 12th century CE (Editors of the Encyclopedia Britannica, 2023a, b; Eldredge, 2020; Khanam, 2011). It was not until the late 20th century that some of these practices were subjected to empirical research to determine if and how they work (Rosch, 2007). In recent years, this research has focused mainly on mindfulness along with some other Eastern practices, and Western contemplative practices have gone largely overlooked (Plante, 2010).

Contemplative practices are a source for psychotherapeutic interventions

The contemporary psychological study of religion generally follows a functionalist approach, focusing on the nonreligious (or not uniquely religious) consequences of practices (Hinnells & Segal, 2010). This approach can be used to study the effects of contemplative practices on mental health, including how they may influence levels of anxiety, depression, cognition, and other clinically significant issues. The assumption here would be that contemplative practices fill some societal need related to well-being. The apparent benefits of contemplative practices in these areas have given rise to interest in therapeutic uses of spiritual tools in clinical settings, especially mindfulness (Knabb, 2012; Plante, 2016). The explosion of research on mindfulness has been productive, yielding clinical mindfulness-based interventions such as mindfulness-based stress reduction (MBSR), mindfulness-based cognitive therapy (MBCT), acceptance and commitment therapy (ACT), and dialectical behavior therapy (DBT) (Kabat-Zinn, 2003; Linehan, 1987; Segal et al., 2002; Zettle & Hayes, 1986.). These methods have absorbed Buddhist practice into modern Western psychology and in most cases are secularized and deviate from the original spiritual and religious origins of the practices (Rosch, 2007). Consequently, there has been debate about whether or not meditative and contemplative practices should remain spiritual or if they could be used in nonsectarian ways as well without losing the health benefits (Wachholtz & Austin, 2013; Wachholtz & Pargament, 2005). Buddhist meditative practices have been secularized in psychotherapy and in research, and they have still had positive effects on mental health (Moulton-Perkins et al., 2022). Perhaps Western religious and spiritual contemplative practices, which have generally been ignored by empirical researchers compared to Eastern practices, can also contribute to psychology in this way. The present study seeks to explore this through an investigation of a Christian contemplative practice called centering prayer (CP).

Centering prayer as an alternative to mindfulness-based interventions

There is a dearth of research on the effects of CP, despite the recent increased interest in contemplative practices. Most of the attention has been focused on mindfulness, but CP is similar to mindfulness, suggesting that it might have similar effects on mental health for those who practice it. Bingaman (2013, 2014, 2016) thoughtfully argues that contemporary neuroscience research has provided evidence for the benefits of contemplative practices, including CP, and thus contemplative practices are as important and influential as religious beliefs and doctrine (Bingaman, 2016). Knabb (2012) argues that CP is so similar to MBCT that it could theoretically be used as an alternative in clinical practice. Among other

similarities, both CP and MBCT are derived from religious traditions, encourage the practitioner to detach from cognition, and require the practitioner to focus on the present moment (Knabb, 2012). The study of mindfulness has helped provide a foundation for studying contemplative practices in general, indicating what potential effects to look for and in what settings studies can be conducted. College campuses have been a setting in which mindfulness has been studied as a method of stress reduction and therapeutic treatment because of increases in mental health struggles in students (Wang et al., 2020). In the past two decades, there has been a significant increase in the rate of mental health diagnoses and use of psychological services by undergraduate students (Lipson et al., 2019; Oswalt et al., 2020). This increase in demand for counseling and other mental health services has led researchers and clinicians to seek solutions that include contemplative practices. For example, the Ignatian examen, another Christian contemplative practice, has also been examined in a university context because of its similarities to cognitive behavioral therapy (Plante, 2021, 2022a, b). Additionally, mindfulness practices taught as part of a university course on Buddhism led to comparable effects to that of MBSR used by students (Sensiper, 2022). The present study using CP similarly uses a sample from an undergraduate course on Christian mysticism that teaches CP as part of the curriculum.

The method of centering prayer

Centering prayer originates from the ancient Christian tradition of contemplation, with its roots in the early Christian mystics (Reininger, 1996). Centering prayer is passive compared to typical forms of Christian prayer involving direct conversation with God, and it is characterized by surrender and acceptance of God rather than verbal communication with God. Theoretically, God interacts with the practitioner's unconscious once they expand their awareness and lower their guard (Bourgeault, 2004). From the Christian theological perspective that birthed the practice, CP trains practitioners to recenter themselves in God, become more aware of God's presence, let go of anxiety when it arises, and respond to life's struggles with composure (Bourgeault, 2004; Plante & Ferguson, 2010). These theoretical effects are not all empirically testable, but measurable variables such as level of anxiety, level of mindful awareness, hope, and satisfaction with life can be empirically tested.

Thomas Keating, one of the developers of CP, provided the following instructions for practicing CP (Keating, 1994):

1. Choose a sacred word as a symbol of your intention to consent to God's presence and action within.
2. Sitting comfortably, and with eyes closed, settle briefly and silently introduce the sacred word as the symbol of your consent to God's presence and action within.
3. When you become aware of thoughts, return ever so gently to the sacred word.
4. At the end of the prayer period, remain in silence with eyes closed for a couple of minutes. (p. 118)

The inclusion of a sacred word contributes to the potential improvement in concentration by recentering after the mind wanders. Bourgeault (2004) calls this the "coming back muscle." Bourgeault, a well-known CP teacher, adds the following "Four R's" to pair with Keating's instructions:

Resist no thought.
Retain no thought.
React to no thought.
Return ever so gently to the sacred word. (pp. 39–40).

CP is widely practiced, and is taught in groups, one-on-one, in church settings and monasteries, and in religious community groups (Ward, 2005). The present study examines CP taught in an undergraduate classroom setting as part of a course on Christian mysticism. Part of the goal of the course curriculum is to help students gain an idea of what contemplative practice might have been like for the early Christian mystics.

Empirical research on centering prayer

Studies on the effects of CP on well-being are sparse, but they have all suggested that CP has positive effects and that more research is needed (Bingaman, 2013, 2014, 2016). Johnson and colleagues (2009) followed a group of people diagnosed with ovarian cancer who were offered the opportunity to participate in 11 weeks of CP sessions. Though it had a small sample size, the results showed significant decreases in anxiety, depression, and anger. However, the effects on depression and anger did not last when measured by a follow-up survey. The researchers also observed an increase in spiritual well-being. Ferguson et al. (2010) examined a group of Christians who participated in 10 weekly, two-hour sessions of CP. They were unable to show a significant decrease in trait anxiety, but participants reported a decrease in stress and anxiety with regard to their relationship to God. However, this study also included other activities such as meditative walking, scripture reading, and group sharing, so any results may have been influenced by these additional activities. Fox and colleagues (2015) found that people who regularly practiced CP reported that it decreased their stress and anxiety and helped them respond more calmly to stressors of everyday life. In a later study, Fox and colleagues (2016) studied a group that practiced CP together, and they found no significant effect on depression. There was a decrease in stress and anxiety and an increase in mindful awareness. The study was limited by the lack of a control or comparison group, so the researchers could not account for maturation, regression, or history effects. Dorais and colleagues studied a similar contemplative practice called centering meditation, which was derived from CP and shares the movement from a wandering mind to focusing on the sacred (Dorais, 2021; Dorais & Gutierrez, 2021; Dorais et al., 2022). In a pilot diary study, they examined the impact of daily centering meditation practice on interpersonal and social well-being and found an association between daily practice and improved relational well-being (Dorais et al., 2022). In a separate, randomized, controlled trial on the effects of centering meditation, Dorais and colleagues found a significant increase in mindfulness and decrease in stress over a four-week period (Dorais & Gutierrez 2021). Of these studies, only those by Ferguson et al., (2010) and Dorais and Gutierrez (2021) contained a comparison or control group. In sum, CP is associated with decreased anxiety and may increase well-being, but much of the available research cannot attribute causation to CP and has mainly focused on group settings.

Bingaman (2013, 2014, 2016) argues that since CP is not as fully embraced by Western Christianity as mindfulness is by the Eastern religious traditions, less research has been conducted on contemplative practices despite the encouraging results of the research that has been conducted, especially on the neuroscience benefits of contemplative practices.

Research questions

The goal of this study is to further understand the effects of CP on an individual's level of hope, satisfaction with life, compassion, mindfulness, depression, stress, and anxiety. Other studies have examined the effects of CP in group settings and on retreats, and we sought to examine the consequences when individual practitioners participated in CP practice on their own as part of a course. We were also interested in answering the question of whether or not religiosity made a difference in the effects of CP. Our research questions were as follows:

1. After seven weeks of CP practice, are there significant differences in depression, anxiety and stress between a CP group and a comparison group when CP is practiced in both a classroom setting and individually?
2. Does a CP group differ from a comparison group on mindful awareness, levels of satisfaction with life, hope, and compassion after seven weeks of practice?
3. Is there a relationship between religiosity and the association between CP and well-being? In other words, does the religiosity of practitioners help explain the potential relationship between CP practice and well-being outcomes?

Hypotheses

1. We predicted that practicing CP for roughly 30 min every week for seven weeks would be associated with significant decreases in reported anxiety and stress levels compared to a comparison group, but we did not expect any change or difference in levels of depression.
2. We predicted that practicing CP for roughly 30 min every week for seven weeks would be associated with increases in mindful awareness, satisfaction with life, hope, and compassion compared to the comparison group.
3. We predicted that level of religiosity would not affect the effectiveness of CP as a therapeutic tool.

Methods

Participants

All recruited participants ($N=57$) were enrolled in one of two religious studies courses at the same university with the same professor. Students choose their own enrollment, so the participants self-selected into the intervention and comparison groups. Participants were not recruited into these courses, so the sample should be considered a convenience comparison sample. Of the 61 students enrolled in the two courses, 57 (93%) agreed to participate in the study and 38 (62%) were included in the analysis. Of the 38 participants who completed the second survey, 25 (44%) completed all three surveys (56% attrition rate) over the course of the seven-week study.

The mean age of the participants was 19.4 years ($SD=1.08$). Of the 25 participants who completed the final survey, 9 were men (36%) and 16 were women (64%). Forty-two

percent of the participants were Asian ($n=8$), 42% White ($n=8$), 10.5% Hispanic or Latino ($n=2$), and 5.3% Middle Eastern or North African ($n=1$). In terms of religious identity, 43.5% of participants were atheist or agnostic ($n=10$), 21.7% Catholic ($n=5$), 13% Christian and not Catholic ($n=3$), 8.7% other ($n=2$), 4.3% Hindu ($n=1$), 4.3% Buddhist ($n=1$), and 4.3% Jewish ($n=1$). When asked about their familiarity with CP at Time 1, 16% said they had done CP in the past ($n=4$), and 4% reported currently regularly practicing CP ($n=1$) (Table 1).

Procedures

An intervention group was chosen from an in-person undergraduate religious studies course that requires CP as part of the curriculum. The course curriculum included CP as an assignment, and students were required to do the practice both in class and on their own time. A comparison group was selected from an in-person undergraduate religious studies class taught by the same professor, and this course did not require any contemplative practice as part of the curriculum. Students at this university are required to take religious studies courses, but they may select specific courses from a broad selection.

Participants received an announcement through their online learning management platform inviting them to participate in a study on the relationship between contemplative practice and wellness. The announcement included a link to an online survey, and the instructor for both courses repeated it once at the beginning of a class. The announcement was repeated at Times 2 and 3, and participants also received an email reminding them to complete the second and third surveys at each respective time. Participants were offered extra credit in their respective religious studies course for their participation, and those who did not wish to participate could receive extra credit in other equally convenient ways. Both groups of participants completed the initial pre-intervention survey before the CP group was trained to do the practice. Then, the CP group learned CP over a 1.7-h class

Table 1 Participant demographics with descriptive statistics

| Variable | Mean | <i>SD</i> |
|---------------------------------|----------|-----------|
| Age | 19.4 | 1.08 |
| | <i>n</i> | % |
| Gender | | |
| Man | 9 | 36.0% |
| Woman | 16 | 64.0% |
| Ethnicity | | |
| Asian | 8 | 42.0% |
| White | 8 | 42.0% |
| Hispanic or Latino | 2 | 10.5% |
| Middle Eastern or North African | 1 | 5.3% |
| Religious Identity | | |
| Atheist/Agnostic | 10 | 43.0% |
| Catholic | 5 | 21.7% |
| Christian | 3 | 13% |
| Other | 2 | 8.7% |
| Hindu | 1 | 4.3% |
| Buddhist | 1 | 4.3% |
| Jewish | 1 | 4.3% |

period, following Cynthia Bourgeault's training method (Bourgeault, 2004). They began by learning other grounding techniques such as counting meditation. The instructor told the class that practicing CP might do the following: lead to greater acceptance or patience for self and others, deepen their relationship with their deity or deities, make it easier to act morally, or do nothing at all. Participants could choose whether to practice CP theistically or nontheistically for the rest of the academic term, and they could choose their own sacred word. They were asked to practice CP at least five times per week on their own outside of class in addition to regularly practicing in the classroom. Each time was expected to be a minimum of five minutes but could be as long as desired. When practicing in class, the instructor led a brief stretch and allowed students to calm and ground themselves before beginning the practice for roughly five minutes. The comparison group was in a different religious studies course with the same instructor, and they were not asked to practice CP, nor were they informed about what it was. The instructor led a brief grounding exercise once at the start of the study but otherwise did not require students to use contemplative practices. As part of their course, participants in the comparison group did practice emotional management techniques, particularly when a religion in the curriculum was upsetting.

The instructor required both groups of participants to write graded journal entries pertaining to their respective course content. In the comparison group, journals were related to readings for the class, including emotional reactions to the readings. In the CP group, students wrote journal entries about how their CP practice was going and how they perceived their level of serenity.

Centering prayer practice

Participants completed three surveys in total, all containing the same questionnaires. At Time 2 (after 3 weeks) and Time 3 (after 7 weeks), both groups indicated approximate weekly means for how many times and for how long they had practiced CP and other contemplative practices over the course of the study.

Participants were not monitored regularly to confirm that they actually practiced CP, so data on the frequency of their practice depended on responses to a survey manipulation check. All participants were asked how many times, on average, they practiced CP per week and how many average minutes they spent practicing CP per week over the seven-week period. About a third (i.e., 37.5%) of the participants reported not doing any CP at all ($n=9$), 8.3% reported doing 1–15 min of CP per week ($n=2$), 16.7% reported doing 15–30 min of CP per week ($n=2$), 25% reported doing 30–60 min of CP per week ($n=6$), and 8.3% reported doing 60 min or more of CP per week ($n=2$). Of all participants, 20.8% reported doing CP between 1 and 5 times per week ($n=5$), 12.5% reported doing CP 5–10 times per week ($n=3$), 20.8% reported doing CP 10–15 times per week ($n=5$), and 8.3% reported doing CP over 15 times per week ($n=2$). One participant from the group that was not required to practice CP did practice and reported practicing 1–5 times per week for 1–15 min per week on average.

Measures

Participants responded to self-report surveys containing scales assessing compassion, religiosity, mindfulness, hope, meaning in life, satisfaction with life, depression, stress, and anxiety.

Satisfaction with Life Scale (SWLS) We used the Satisfaction with Life Scale (SWLS) to measure life satisfaction, a key component of subjective well-being (Diener et al., 1985). The scale has five items (e.g., “In most ways my life is close to my ideal”) and uses a 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*). It has shown test–retest reliability and internal consistency (Diener et al., 1985; Pavot & Diener, 1993).

State Hope Scale (SHS) The State Hope Scale (SHS) was created and validated to assess hope situationally, whereas before it was conceptualized as a personality trait or disposition (Snyder et al., 1996). According to Snyder, hope is defined as the process of thinking about goals, the motivation to achieve those goals, and the ability to successfully accomplish them. The SHS has been found to have good internal consistency ($\alpha=0.81$) and factorial validity ($\chi^2=4.53$, $p=0.21$; $df=3$) (Martin-Krumm et al., 2015). The same study also found that the SHS has good internal reliability, so both subscales are correlated (Martin-Krumm et al., 2015).

Mindful Attention Awareness Scale (MAAS) The Mindful Attention Awareness Scale (MAAS) is a 15-item questionnaire used to measure trait mindfulness (Brown & Ryan, 2003). According to the authors of the measure, mindfulness is open or receptive awareness and attention and concerns quality of consciousness. It is deliberate attention to the present moment, and in the development of this scale, it was understood as a naturally occurring characteristic for which most people have a baseline. Each item is a first-person assertion. Participants responded on a 5-point Likert scale ranging from 1 (*almost always*) to 6 (*almost never*) about how frequently or infrequently they have particular experiences that can indicate the presence of mindfulness. A review reported that the MAAS has a one-factor structure and indicated support for test–retest reliability (ICC=0.81) and internal consistency (Cronbach’s alphas ranging from 0.78 to 0.92) (Park et al., 2013).

Depression Anxiety Stress Scale (DASS-21) The Depression, Anxiety, and Stress Scale (DASS-21) was used to measure levels of depression, anxiety, and stress. It consists of three scales designed to measure these emotional states and their changes over time (Lovibond & Lovibond, 1995). Participants indicated to what extent statements applied to them over the past week on a 4-point Likert scale ranging from *did not apply to me at all* to *apply to me very much or most of the time*. Higher scores indicate higher levels of depression, anxiety, and/or stress. Studies have indicated that the DASS-21 is appropriate for undergraduate students in the United States (Kia-Keating et al., 2018).

Santa Clara Brief Compassion Scale (SCBCS) To measure levels of compassion, we used the Santa Clara Brief Compassion Sale (SCBCS; Hwang et al., 2008), a shortened version of the Compassionate Love Scale (CLS; Sprecher & Fehr, 2005). The SCBCS consists of five self-descriptive items answered on a 7-point Likert scale ranging from 1 (*not at all true of me*) to 7 (*very true of me*). Participants responded to items such as “I would rather engage in actions that help others, even though they are strangers, than engage in actions that would help me.” The measure was significantly correlated with the CLS ($r=0.96$), indicating strong convergent validity (Hwang et al., 2008).

Meaning in Life Questionnaire (MLQ) The Meaning in Life Questionnaire (MLQ) assesses individuals’ degree of presence and search for meaning in life, which are considered indicators of well-being (Steger et al., 2006). It yields two scores, one for search and

one for presence of meaning in life. It is a 10-item measure in which participants indicate how true statements are about themselves on a 7-point Likert scale ranging from 1 (*Absolutely true*) to 7 (*Absolutely untrue*). Items include statements like “I am always looking to find my life’s purpose” and “I have discovered a satisfying life purpose.” The MLQ reportedly has adequate construct validity and test–retest reliability, meaning that it does consistently measure both a search and a presence for meaning in life (Rose et al., 2017). The MLQ appears to be valid and reliable across sociodemographic factors (Naghiyae et al., 2020).

Santa Clara Strength of Religious Faith Questionnaire (SCSRFQ) To assess religiosity, a shortened version of the Santa Clara Strength of Religious Faith Questionnaire (SCSRFQ) prompted participants to rate how true five statements were for their own faith (Plante et al., 2002). For example, participants answered if the statement “my faith impacts many of my decisions” applied to them on a 4-point Likert scale. The longer version has 10 statements rated on a 7-point Likert scale (Plante & Boccaccini, 1997). This questionnaire is preferable because it appears to minimize bias towards any particular faith tradition. It has been shown to have high internal consistency, test–retest reliability, and convergent validity (Storch et al., 2004).

Results

Preliminary analysis

In order to proceed with the analysis, it was determined whether the data met the necessary assumptions for a multivariate analysis of variance (MANOVA) or a multivariate analysis of covariance (MANCOVA). A MANCOVA allows researchers to observe changes in variance due to an independent variable while controlling for or covarying out a third variable, in this case the mean baseline scores for each outcome variable. Normality of dependent measures and demographic data was assessed using the Shapiro–Wilk’s statistic, and violations were found for religiosity, search for meaning in life, and satisfaction with life. No outliers were found, and all data was approximately linear. Homogeneity of variance–covariance and homogeneity of regression slopes were assessed using Wilk’s λ in multivariate tests and tests for between-subjects effects. No significant demographic differences were found between the CP group and the non-CP group. A MANOVA was conducted at Time 1 to test for between-group differences in gender, ethnicity, and religious identification, and the results indicated no significant differences, multivariate $F(25, 2) = 2.56, p = 0.130$.

Centering prayer and mental health outcomes

MANCOVAs were conducted on five variables for mental health: depression (DASS-21), anxiety (DASS-21), stress (DASS-21), satisfaction with life (SLS), and hope (SHS). There was no significant change in depression, Wilk’s $\lambda = .959$, between-subjects $F(4, 22) = .812, p > .05$ and stress (shown in Fig. 1, Wilk’s $\lambda = .959$, between-subjects $F(4, 22) = .691, p > .05$). As shown in Fig. 2, anxiety scores demonstrated a decreasing trend, but the change was not statistically significant at the $\alpha = .05$ level, Wilk’s $\lambda = .841$, between-subjects $F(4, 22) = 3.837, p = .064$. There was no significant change in satisfaction with life, Wilk’s

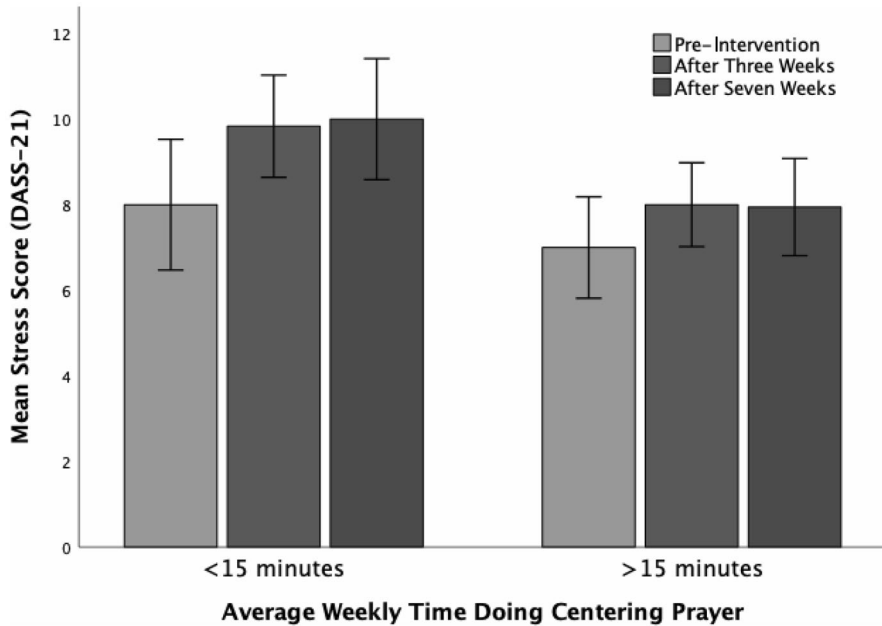


Fig. 1 Change in stress over time and time spent doing centering prayer. *Note:* The X-axis is categorized into sets of 15 min rather than group assignment because all participants who responded that they did less than an average of 15 min of centering prayer per week, even those in the intervention group, reported not doing any centering prayer at all. $N(<15)=11$, $N(>15)=13$. Error bars represent standard error

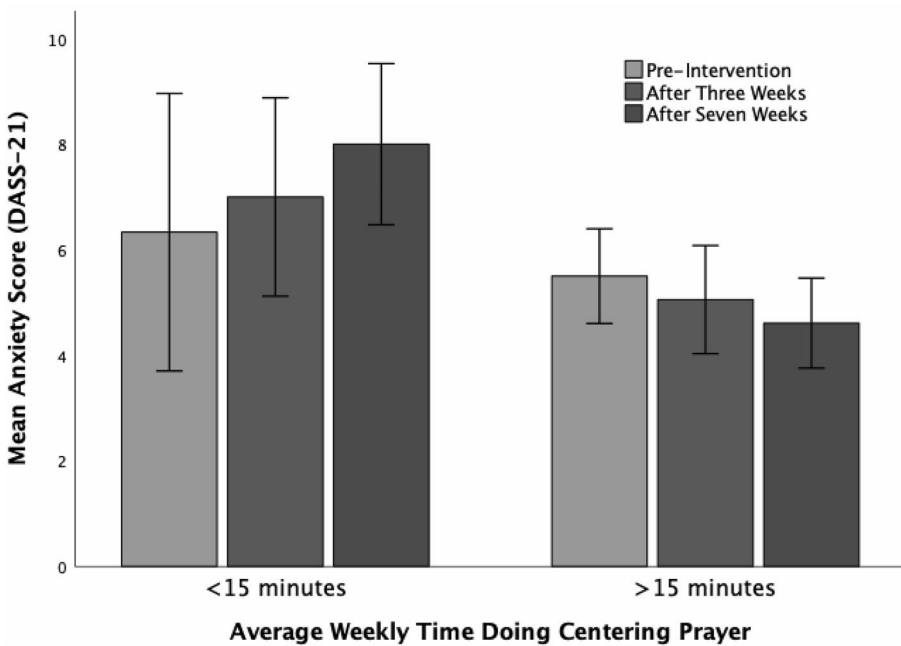


Fig. 2 Change in anxiety over time and time spent doing centering prayer. *Note:* Error bars represent standard error

$\lambda = .987$, between-subjects $F(4, 22) = .142$, $p > .05$. As depicted in Fig. 3, there was an effect of CP on hope such that participants who practiced for an average of 15 min or more per week increased in hope (Wilk's $\lambda = .371$, between-subjects $F(4, 19) = 3.52$, $p = .027$, $\eta_p^2 = .439$). However, post-hoc univariate tests indicated that the change in hope was not statistically significant [$F(2, 16) = 9.946$, $p = .095$] (Fig. 4).

Centering prayer and religion and spirituality outcomes

MANCOVAs were conducted on four variables for religion and spirituality, including religiosity (SCSRF), meaning in life (MLQ), compassion (SCBCS), and mindfulness (MAAS). Participants who practiced less than 15 min of CP per week, including those who did not practice at all, increased in religiosity, while those who practiced CP for more than 15 min per week did not change (Wilk's $\lambda = .425$, $F(2, 24) = 17.314$, $p = .006$, $\eta_p^2 = .335$). A follow-up paired-samples T-test indicated that the increase was significant (one-sided $p = .020$). There was an effect of CP on meaning in life search such that participants who did not practice CP decreased in meaning in life search and those that did practice remained the same (Wilk's $\lambda = .562$, between-subjects $F(4, 22) = 5.374$, $p = .031$, $\eta_p^2 = .204$). A repeated-measures ANOVA showed the same change ($F(2, 22) = 1.070$, $p = .046$), but post-hoc tests indicated that the difference was not significant. There was no significant change in

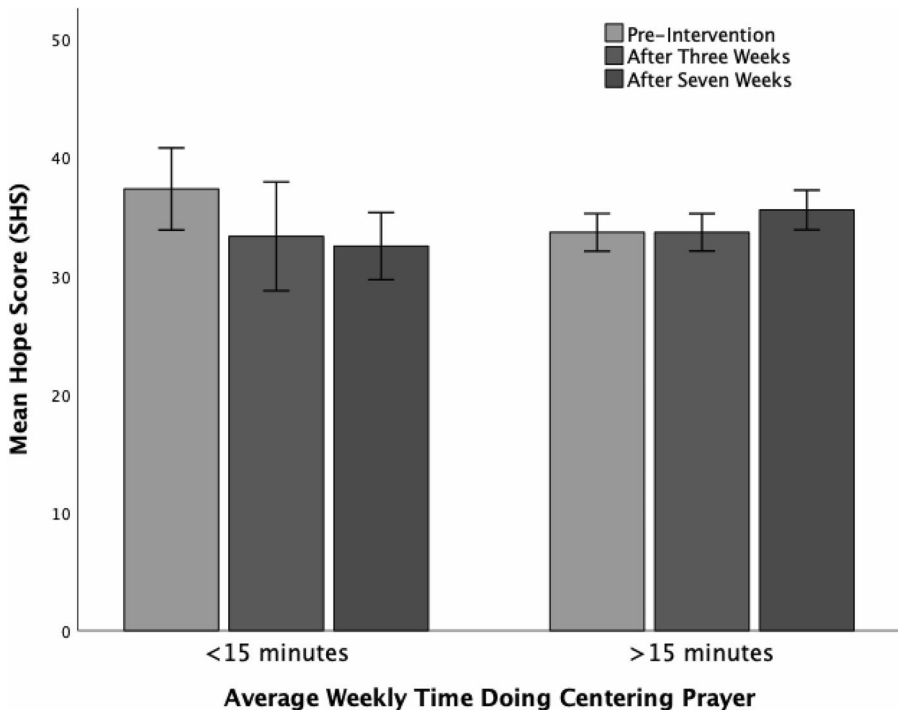


Fig. 3 Change in hope over time and time spent doing centering prayer. *Note:* Error bars represent standard error

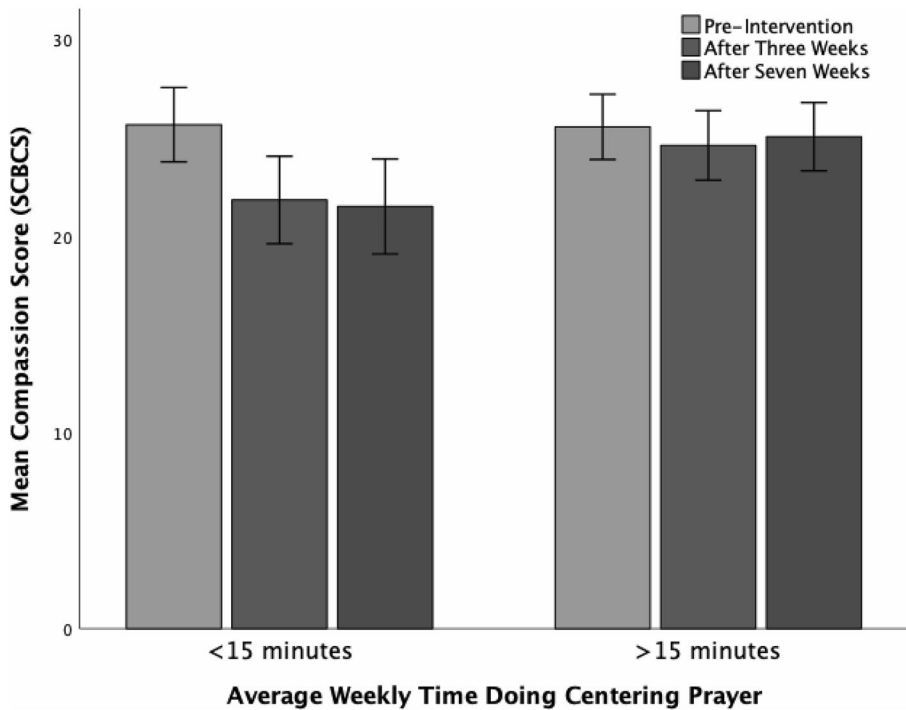


Fig. 4 Change in compassion over time and time spent doing centering prayer. *Note:* Error bars represent standard error

meaning in life presence (Wilk's $\lambda = .976$, between-subjects $F(4, 22) = .173$, $p > .05$). With regards to compassion, the comparison group decreased while the CP group did not change (Wilk's $\lambda = .646$, $F(2, 24) = 8.196$, $p = .010$, $\eta_p^2 = .301$). However, post-hoc tests indicated that the decrease over time was not significant (Tukey HSD = .968). There was no significant change in mindfulness ($F(2, 24) = .160$, $p > .05$).

Discussion

This study was an investigation of CP as taught by an instructor in a classroom setting and practiced by undergraduate students for seven weeks. The contemplative practice was required as a homework assignment. The goal of the study was to observe the potential for CP to be used as a therapeutic tool, and the first research question was about the possibility that CP decreases depression, stress, and anxiety. There was a decreasing trend for anxiety in the CP group, while the comparison group did not change. The decreasing trend aligned with the results of Fox et al. (2015), who found that long-term practitioners reported significant decreases in anxiety and less reactive responses to stressors. In Fox et al. (2016), participants experienced a significant decrease in anxiety after a three-day CP workshop and three weeks of CP practice. These results are more conclusive than the present study, but neither one offered a control or comparison group. The samples in both studies consisted

of older and almost entirely Christian participants with arguably stronger foundations in CP. Despite the contrast in the sample demographics, a positive trend for anxiety occurred in both, implying that any potential clinical benefits of CP could apply across age and religious identity demographics.

However, compared to the comparison group, those who did practice CP did not change significantly in depression or stress. The lack of change in depression during this study was unsurprising because it was consistent with previous studies on CP (Ferguson et al., 2010; Fox et al., 2015, 2016; Johnson et al., 2009). A hypothesis was made about depression despite previous findings because of the differences between the samples of this study compared to previous studies. The samples in these few other studies were smaller, older, mostly Christian, and not in an undergraduate setting, among other differences that could have influenced the depression outcome. By contrast, the lack of overall improvement in stress was noteworthy since it did decrease in previous studies (Dorais & Gutierrez, 2021; Ferguson et al., 2010; Fox et al., 2015, 2016). The stressful environment of undergraduate education could also possibly explain this finding as well. However, overall stress means appeared to increase statistically insignificantly for both groups in this study, and the participants in the Dorais and Gutierrez (2021) study consisted of a college population.

The second hypothesis predicted increases in mindfulness, satisfaction with life, meaning in life, hope, and compassion. Hope did increase for the CP group, while it decreased for the comparison group and was almost statistically significant in post-hoc tests. This is not a definitive result, but it allows for speculation about whether a larger sample size would have yielded a significant increase in hope for those practicing CP. A previous study in a doctoral dissertation found a similar result using the same State Hope Scale from Snyder et al. (1996), and it found a more statistically significant positive increase in hope over time for those who used CP compared to a control group (Dorais, 2021). That study had a much larger sample size, and it consisted of undergraduate students as well. Dorais (2021) argues that hope can help diminish the negative impacts of stress and is associated with resilience. If the increase in hope in the present study is interpreted as real, it could be that the change is linked to the decrease in anxiety. Perhaps CP increased hope, which brought about resilience, thus making anxiety a less likely response to stressors. It could also be that CP practice made it easier for practitioners to concentrate on the positive aspects of their lives, making the future seem brighter and goals seem more achievable. These are possibilities, and they were not assessed.

Search for meaning in life increased for the CP group but not for the comparison group. This was only indicative of a trend because post-hoc tests showed that the differences were not statistically significant. Compassion decreased for the comparison group and did not change for the CP group, but again, post-hoc tests showed this was merely a trend because it was not significant. An increase in compassion would be consistent with Bourgeault's theory of how CP works. She argues that healing begins with awareness, followed by acceptance, which leads to action. Theoretically, loving, virtuous action becomes easier after acceptance is achieved (Bourgeault, 2004). Substantiating Bourgeault's claim, Fox et al. (2015) reported that long-term CP practitioners described growing in their compassion for others, becoming less judgmental and more accepting. While this is compelling evidence that CP increases compassion, it is provocative enough to suggest further research is warranted, especially given the positive trend for compassion found in this study. This theory thus remains unproven, but the implied trend for compassion suggests that it is worth further investigation. Across the board, these analyses lacked sufficient power. This is likely because of the small sample size of the study, which shrank due to attrition, and the imbalance in the sizes of the CP group and the comparison group. It should be understood that this study was exploratory and the first of its kind in an undergraduate classroom setting.

The lack of a significant association between CP and mindfulness was unexpected, considering Dorais and Gutierrez (2021) found a significant increase in mindfulness for those who did centering meditation. The practices are not identical, but it was expected that they are similar enough that they would both increase mindfulness. This discrepancy may indicate a relevant difference between CP and centering meditation, but it seems more likely that this is a result of the limitations of the present study, including the lack of a control group.

The third and final hypothesis was that religiosity would not affect the relationship between CP and outcome variables. It did not affect these relationships, and religiosity was not a predictor of any change in the outcome variables included in the study. However, religiosity surprisingly changed over the course of the intervention, but only for participants who did an average of less than 15 min of CP per week. This increase in religiosity was the only result that proved to be significant in post-hoc analyses. Participants who did more than 15 min of CP per week did not change in religiosity. The simplest explanation is that the different course content of the two religious studies courses that participants took was responsible for the change in religiosity. The course that the comparison group took was related to understanding religions in general, while the CP group took a course focused on Christianity. It may be that the course on religion in general led students to reflect on their own faith and religious engagement, which could have led to an increase in average religiosity for students in the course.

Limitations and future directions

These findings contribute to the meager empirical research into the topic of CP because they are the first results for a sample of religiously diverse undergraduate students in a classroom setting with a comparison group. The differences between this study and the few previously conducted studies help demonstrate how and why CP may or may not work as a therapeutic tool. For example, this study has stronger ecological validity than the others as the environment is most similar to where an intervention would take place if a university began a CP program as part of a student mental health campaign. The sample size is small due to attrition, and the CP group was larger than the comparison group by five participants. This decreased the power of the study, and more results may have been significant had the sample size been larger. The presence of the comparison group did allow some control for maturation effects, history effects, and regression to the mean, but a true control group would strengthen the study. The comparison group had many similarities to the CP group, but the difference in course content may have been at least partially responsible for the differences between the two groups. Using a convenience sample was also a limitation to the study, and random selection and assignment would be obvious improvements. Students self-selected into each group by choosing their own courses, and this could account for some hidden group differences. Although participants reported how frequently they practiced CP during the study, there was no guarantee that they actually did it as they said. They most likely practiced during class time, but there is no way to know if they were being honest about how long they practiced on their own time. There was also no way to control the environments where participants practiced CP on their own time, and that may have influenced the quality of the contemplative practice.

These findings indicate trends for compassion, hope, search for meaning, and anxiety, so future research should include these as dependent variables. Future research should include a true control group, have a larger sample size, and continue for longer than seven weeks. It should also include a way to observe participants practicing so there can be more certainty

that they actually do CP. This research should examine CP in a clinical setting as well as continue to use an undergraduate setting.

Conclusion

The present findings are not strongly supportive of using CP in undergraduate settings, but they do give reason to further investigate its potential benefits to student well-being. Trends indicated a decrease in anxiety and increases in hope, compassion, and search for meaning, but they were ultimately not statistically significant. However, with increased interest in the study of Christianity, increased demand for mental health services for college students, and promising results from previous studies, CP should have a place in the field.

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Declarations

Conflict of interest The authors declare that they have no conflict of interest.

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