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The Unique Power of Mindfulness on Blood Pressure and Stress Reduction in a Priest Community

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University of Portland (UP) is one of 247 degree-granting Catholic institutions in the United States, with a community of thirty-one priests residing on campus from the religious order known as the Congregation of Holy Cross (CHC) (Association of Catholic Colleges and Universities [ACCU], 2017). The average age of a Catholic priest in 1975 in the United States was 35 years (Kane, 2017). Thirty-four years later, in 2009, the average was 63, reflecting the general aging trend of the Catholic clergy in the U.S. (Kane, 2017). This population of Catholic priests faces challenges to health and wellness, and literature suggests this specific demographic may also face health disparities (Breitenstein, 2014). Despite the need for support of this population, there is a paucity of research exploring priests’ physical and mental health, and interventions to meet these specific needs (Koller et al. 2012). Paradoxically, priests who throughout their lives have served vulnerable communities, often find themselves facing aging and disease issues without support.

Clinical Issue

The UP priest community has identified several unaddressed health issues, including a desire for more frequent BP monitoring. Hypertension is the leading risk factor of mortality and the third leading factor of disability-adjusted life years in the world, afflicting an estimated 60 million adults in the United States (Chocalingam, Campbell and Fodor, 2006; Kearney et al., 2005; Hughes et al., 2013). Literature reflects that clergy, especially Catholic clergy, may be vulnerable to cardiovascular health disparities. One study of 3,000 clergy found higher incidence of hyperlipidemia and hypertension than that of the general population (Koller, Blanchfield, Vavra, Andrusyk, & Altier, 2012). A separate study of clergy revealed a higher number of self-reports than the general population of chronic disease related to hypertension and angina (Koller et al., 2012). Many priests manage busy schedules and would benefit from a feasible and simple intervention to protect against hypertension. Literature supports the intervention of Mindfulness Based Stress Reduction (MBSR) as one practice leading to reduction in blood pressure.

Background and Significance

Research promotes MBSR as an affordable, simple, and effective way to ease psychological symptoms and subsequently reduce blood pressure and autonomic responsiveness (Ditto, Eclache, and Goldman, 2006; Campbell, et al., 2012; Palta, et al., 2012). MBSR has been explored in a variety of populations across the world (Ditto, Eclache, and Goldman, 2006; Campbell, et al., 2012; Palta, et al., 2012). While no studies specifically focus on religious communities, the consistency of positive findings across such a cultural and geographic variety promotes generalizability of these results. MBSR can be a feasible intervention engaging the priest population in a simple and contemplative practice.

Purpose, Aim, and Research Question

The primary aim of this pilot study was to understand the effect of a mindfulness-based intervention on BP and stress in participants. The primary purpose was to offer low-cost, simple, and feasible methods of enhancing BP among communities in which some individuals do not receive consistent medical care. This study seeks to answer the following question: In the community of focus, how does mindfulness training compared with no mindfulness training affect BP and perceived stress over a time period of eight weeks?

Methods
**Participants**

The study was approved by the UP Institutional Review Board. Enrollment began in January of 2018. This was a volunteer-based study in which participants were recruited by a flyer distributed in a common gathering space and by email. Eleven priests of ages 27-95 who were interested in learning stress reduction and mindfulness techniques elected to participate. The only eligibility requirement was that the participant was a CHC member, in residence at UP. All participants provided informed consent.

**Intervention**

The intervention, a mindfulness-based seminar, involved two one-hour of interactive mindfulness sessions, led by Donald Altman, a psychotherapist, former Buddhist monk, and author on multiple literary works on mindfulness. Altman's experience as a spiritual practitioner was an asset, augmenting engagement paralleling eastern and western faith practices. Topics involved mindfulness neurobiology, physiologic benefits and spiritual origin. The speaker then introduced participants to mindfulness postures and walking mindfulness.

**Measures**

Implementation occurred over eight weeks. On week one, participants attended a 30-minute intake for a pre-intervention assessment performed by the principal investigator (PI). At the pre-intervention assessment, the participant completed an intake form, consent form and Perceived Stress Scale (PSS). After the intervention, participants were asked to practice mindfulness three minutes, three times a day. Weeks four, five, six, and seven involved 20-minute sessions to obtain BP and complete a weekly mindfulness log. On week eight a final BP and PSS were obtained.

**Blood Pressure.** The PI obtained an initial BP through an automatic cuff according to American Heart Association (AHA) guidelines. Prior to measurement, the participant sat quietly for five minutes with legs uncrossed. Three BP measurements were then obtained on the same arm, each separated by two minutes. The Omron BP629 was used, an automated sphygmomanometer validated through the European Society of Hypertension International Protocol and The Association for Advancement of Medical Instrumentation. The PI also provided an educational handout from AHA on BP.

**Stress.** The PSS was used to measure perceived stress in participants at baseline (week one) and at the end of the eight-week implementation period. The PSS is valid and reliable tool (Roberti, Harrington, and Storch, 2006)

**Results**

Pre and post measures of both BP and PSS were compared through data analysis. Statistical Package for the Social Sciences (SPSS) was used to perform 2-tailed t test and a repeated measures analysis of variance (RM-ANOVA).

**Independent t test.** An independent two-tailed t test was conducted to evaluate the hypothesis that the participants’ post-intervention SBP, DBP, and PSS would show a significant reduction compared to the respective pre-intervention SBP, DBP, and PSS. Indeed, as compared to the pre-intervention SBP and DBP, participants showed a statistically significant reduction in both categories (Table 1). Similarly, participants’ DBP and PSS after the mindfulness intervention demonstrated statistically significant reduction (Table 1).

**RM-ANOVA.** An RM-ANOVA was conducted to examine the effects of mindfulness meditation on DBP over a period of eight weeks. Results indicated a significant difference among the six time points (Table 2). Planned contrasts with a Bonferroni correction revealed that average diastolic DBP during week 1
significantly differed from average DBP during week 8. An RM-ANOVA was conducted to examine the effects of mindfulness meditation on SBP over an eight-week period, revealing no statistically significant correlation (Table 3).

**Discussion of Results**

Reduction in both SBP and DBP from week one to week eight exceeded 5 mmhg. Whelton et al. (2002) posits that BP reduction this minimal correlates with reduction in stroke, coronary heart disease, overall mortality. These findings emphasize the public health significance of a simple daily practice.

The RM-ANOVA DBP shows a statistically significant difference across the six time points measured. While it is unclear as to why the RM-ANOVA was significant for DBP and not SBP, these findings do not demonstrate typical reduction of treatment effect, even six weeks after intervention. This unique finding favoring effect in the later weeks suggests that quality of mindfulness practice may mature over time. Priests reported greater levels of fatigue over weeks 7 and 8 of the study due to end-of-semester academic demands as well as holy week responsibilities (homilies, confessions, attendance of events). Amidst this, a statistically significant reduction in BP could reflect the resiliency to stressors that mindfulness brings.

**Summary and Implications**

These pilot results are consistent with previous studies examining the effectiveness of mindfulness-based interventions, showing reduction of BP and stress after implementation of mindfulness practice. This pilot study adds to research by suggesting that mindfulness moments as minimal as three minutes, three times daily, may yield physiologic benefits. This study also presents the value of mindfulness in a population with established spiritual practices. Many Catholic practices such as prayer and the rosary involve moments of stillness, but the mindfulness tools used in this study harnessed the physical with the spiritual.

**Limitations**

This study could not control for antihypertensive medication adjustment, or tobacco use by participants prior to BP measurement. Challenges to internal validity include variability in timing of BP checks, small sample size and participant age variance. BPs were acquired at different times of day based on participant availability, and not consistently checked on the same arm. Selection bias may exist as volunteer sampling may reflect higher levels of motivation than that of the general priest population. Lastly, the number of documented minutes is self-reported, and increases risk of less accurate reporting.

**Conclusion**

The motivation and change demonstrated by members of the community may set a tone for future sustainability, promoting a culture of health that lasts past implementation. Flottorp et al. (2013) emphasizes the importance that social norms and context have in regards to sustainability of practice change. Future initiatives driven by this understanding will further promote the health of this community.

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**Title:**
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**Keywords:**
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References:


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Abstract Summary:
Hypertension is a leading risk factor of global mortality. A local priest community identified elevated blood pressure as a concern, and mindfulness practice was taught and implemented as an evidence-based method of blood pressure reduction. Mindfulness practice resulted in a statistically significant reduction in both perceived stress and blood pressure.

Content Outline:

1. Background
   1. Catholic clergy is a population vulnerable to health disparities
   2. Multiple studies posit this demographic may be at risk for cardiovascular disease, among other health problems.

2. Need for Change
   1. A local priest community identified blood pressure screening and health promotion as a priority
   2. This community would benefit from a simple and feasible intervention to screen for BP and promote BP reduction

3. Purpose and Aims
   1. Aim: Understand the effect of mindfulness on blood pressure and stress reduction in participants.
   2. Purpose: Offer low-cost, simple, and feasible methods of enhancing blood pressure in communities in which access to medical care may be inconsistent.

   • Evidence and Benefits.
     1. MBSR has been shown to decrease BP in multiple populations
     2. Research promotes MBSR as an affordable, simple, and effective way to reduce psychological symptoms and BP.

4. Implementation
   1. Priests were recruited on a volunteer basis to participate in two mindfulness sessions followed by daily home practice.
2. Over an eight week implementation period, participants completed a Perceived Stress Score (PSS) and BP screening before and after two one-hour mindfulness seminars. Blood pressures and mindfulness practice were documented weekly.

3. The two one-hour mindfulness seminars were led by an expert mindfulness practitioner and author, and focused specifically on harnessing the breath and the body to achieve a physiologically relaxed state.

4. The mindfulness goal: daily practice for three minutes, three times a day. During the 8-week implementation period.

5. An independent T-test revealed a statistically significant change in systolic blood pressure (SBP), diastolic blood pressure (DBP) and PSS.

6. A repeated measures ANOVA was performed. Planned contrasts with a Bonferroni correction revealed that average diastolic blood pressure during week 1 significantly differed from average diastolic blood pressure during weeks 6, 7, and 8.

7. Recruitment
8. Measures
9. Intervention
10. Results

- Discussion
  1. Challenges to internal validity: BP checks at different times of day, small sample size, wide age range of participants.
  2. Self-reported mindfulness minutes increases the risk of variance in reports and less accurate reporting.
  3. Findings promote the use of simple, brief, mindfulness practices to reduce BP and stress levels.
  4. Limitations

- Lessons Learned
  1. Participants found the physiologic engagement of diaphragmatic and abdominal breathing, combined with posture adjustment, to be uniquely helpful in promoting relaxation.
  2. Two acute cardiogenic disorders were detected during screening exams. These simple blood pressure screenings were a means of engaging participants in health promotion and provide detection of abnormal findings and referral.
  3. Nurse Practitioners (NPs) work with patients with limited financial resources. An understanding of the effect of mindfulness on BP and autonomic regulation will equip the NP in providing cost-effective resources to patients.
  4. This pilot study demonstrated the unique power of frequent, brief moments of mindfulness as short as three minutes, three times daily, in reducing stress and blood pressure.
  5. This study provided an opportunity for the University of Portland School of Nursing (UPSON) to promote wellness and mindfulness in this priest community, informs future initiatives.
  6. The wellness theme established by this community is Aging in Place. The UPSON has the ability to promote this goal through increased contact with undergraduate and graduate nursing students.
  7. For sustainability, establishment of a consistent care professional through UPSON for the community is advised. Specifically, a symbiotic relationship between a faculty DNP in need of clinical hours, and home visits among this community is recommended.
  9. Screening as Opportunity to Alert of Acute Conditions.
  10. Benefit to NPs.
  11. Recommendations
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Author Summary: Joy earned her Bachelor of Science in Nursing from the University of Portland in 2010. After graduation, she began her clinical career as a staff RN in a large Portland-area emergency room, and in 2015 joined the University of Portland’s DNP-FNP program. Joy’s research interests were inspired by a passion for merging the physical and spiritual to promote wellness.