Emergency department utilization among adult patients diagnosed with chronic pain and depression from an urban safety-net patient population

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Boston University
EMERGENCY DEPARTMENT UTILIZATION AMONG ADULT PATIENTS
DIAGNOSED WITH CHRONIC PAIN AND DEPRESSION FROM AN URBAN
SAFETY-NET PATIENT POPULATION

by

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DEDICATION

I would like to dedicate this work to my mother and father, who exemplify lives driven by a deep gratitude, and in turn, have taught me how to live deeply and intentionally.
ACKNOWLEDGMENTS

I would like to acknowledge, Dr. Paula Gardiner, the IMGV Principal Investigator and my mentor who inspired me with her compassion and investment into her patients and staff; Dr. Vickery Trinkaus-Randall, my academic advisor who challenged me to think critically about my passions; Dr. Theresa Davies, my thesis advisor who guided me through the writing process; Lily Negash, the IMGV Biostatistician and my friend who provided me support on the data analysis; Anna Lestoquoy, the IMGV Study Coordinator who advised me on researching emergency care and navigating Epic; and Linda Rosen, the BMC Clinical Data Warehouse Manager whose detailed analytical work saved me countless hours.
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ABSTRACT

Background

Patients visit the emergency department (ED) for life-threatening conditions, such as broken bones or chest pain, and non-life threatening conditions such as medication refills and pain management. Patients may make ED visits for non-life threatening conditions because they lack access to primary care. Research has shown that patients who are low-income, have chronic conditions, such as pain, and have depression are among those most likely to use the ED at a high rate. One of the most common reasons for visiting the ED is for pain relief, and therefore an intervention on patient self-management might prevent ED visits.

The Program for Integrative Medicine and Health Care Disparities at Boston Medical Center (BMC) developed the Integrative Medicine Group Visit (IMGV) model to address chronic pain and depression among low-income patients, with the goal to improve patient’s adherence to self-management of pain and depression. The IMGV model consists of three non-pharmacologic components: evidence-based complementary medicine, mindfulness-based stress reduction, and group medical visits – all of which have been used to manage pain and depression. In a pre-post study of IMGV conducted in 2014, IMGV was associated with a significant decrease in ED utilization. Currently,
the Program is conducting a randomized clinical trial (RCT) to compare a number of outcomes between the IMGV model and standard of care. The aim of this study was to determine if IMGV affects ED utilization in adult patients diagnosed with chronic pain and depression from an urban safety-net hospital population.

Methods

We conducted a secondary database analysis of participants enrolled in the IMGV RCT. The RCT is a two-armed study, and the medical chart review is part of the RCT. The study had patients who sought primary care at BMC and two affiliated outpatient urban community clinics. Only emergency visits made at BMC’s Emergency Department were included in our analysis. The inclusion criteria included reporting a pain level score > 4 on a 0-10 scale and having a score > 5 on the Patient Health Questionnaire-9. The intervention consisted of 10 IMGV sessions over 21 weeks. The control was standard treatment of care.

Data extraction was completed in two ways: (1) the BMC Clinical Data Warehouse was extracted from Epic and (2) hand review took place by research assistant. The primary outcomes included ED encounters at two different time points: (1) 90 days before Session 1 and (2) Session 1 to Session 9. The extracted information also included information about patients’ chief complaints and discharge diagnoses. A visit was categorized as being a preventable emergency visit (PEV) or a non-preventable emergency visit (NEPV). Descriptive statistics and two-sample T-tests were used to analyze outcomes.
Results

At baseline, 22 of the 31 participants made at least one ED visit in the 90 days before Session 1. At 9-weeks, 14 of the 26 participants made at least ED visit. From baseline to 9-weeks, the number of participants who had at least one ED visit decreased for the intervention group (13 to 4), but increased for the control group (9 to 10). From baseline to 9-weeks, the number of visits decreased among intervention participants (16 to 5) but increased among control participants (11 to 12). The two-sample T-test, which compared the ED utilization among the intervention and control, resulted in the mean values of -0.7333 and 0.0625, respectively. This result indicated that intervention participants had overall lower ED visit use from baseline to 9-weeks.

Emergency visits were also analyzed by whether they were PEV or NPEV. Of the 27 ED visits at baseline, 21 were classified as being a PEV, and 6 were classified as being a NPEV. Of the 17 ED visits at 9-weeks, the number of visits decreased for both PEVs (21 to 13) and NPEV (6 to 4).

Conclusion

We wanted to determine if the IMGV reduces ED utilization in patients with chronic pain and depression. Our results suggest that the IMGV model may be associated with reduced overall ED utilization and reduced preventable ED visits. However, one limitation is that we have a very small sample size. This finding needs to be produced in an adequately powered clinical trial. Further research might explore the mechanisms for
how the IMGV model can lead to lower ED utilization among patients with chronic pain and depression.
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INTRODUCTION

Emergency department use in the United States

From 1995 to 2010, the emergency department (ED) visit rate, which takes into account population change over time, increased 16% in the United States (NCHS, 2013). In other words, the visit rate went from 37 visits per 100 persons in 1995, to 43 visits per 100 persons in 2010 (NCHS, 2013). Though the proportion of ED visits increased, the number of emergency departments decreased by 11% during in that same period (NCHS, 2013). This lower access to emergency care has wide-reaching effects on the costs and resources in the American health system. For example, one direct effect has been overcrowding of emergency department (NCHS, 2013; Harris et al., 2016).

Overcrowding can lead to a diversion of ambulances, frustration of ED staff, lower patient satisfaction, and greater risk for poor health outcomes (Olshaker, 2009).

Emergency department visits are also costly to the individual patient, especially if the visit is for a non-life threatening condition, or a health condition that is related to not having access to a primary care physician (PCP). According to the Centers for Disease Control and Prevention (CDC), the cost of an ED visit for a nonemergency is seven times higher than the cost of a community health visit (NCHS, 2013).

Patients utilize the emergency room for serious, life-threatening conditions, such as broken bones or severe chest pain; and non-life threatening, acute conditions such as medication refills and pain management. Seeking emergency care for non-life threatening conditions however is concerning for reasons beyond financial costs. Due to the nature of
the ED, emergency care lacks continuity, coordinated care, and follow-up care (NCHS, 2013). An analysis found that 8% of ED visits in 2007 were considered non-urgent (GAO, 2011).

There are multiple reasons why patients do not go to their PCPs for non-life threatening conditions and instead seek emergency care. Patients may not be able to evaluate the urgency of a medical or health condition (NCHS, 2013). They may also face financial barriers, be unaware of other sources of care within their community, and have difficulty accessing primary care and other providers (GAO, 2011).

Emergency departments are becoming increasingly overcrowded, and with the limited ED resources, there is an incentive among policy-makers and hospital administrators to improve care in order to prevent ED overutilization (Castillo et al., 2014), especially among at-risk patients. Reduction of ED use, especially for non-urgent reasons, could result in cost-savings for the American health system and for patients, especially that they oftentimes are of low socioeconomic status (Peppe et al., 2007; NCHS, 2013).

**Determinants of Frequent ED Users**

In general, patients are more likely to use the emergency room if they are among the poor, have chronic conditions, have depression, the elderly, have fair or poor health, and use Medicaid insurance (Peppe et al., 2007; Choi et al, 2012; NCHS, 2013). When comparing the demographics of high ED users (defined as 4+ visits over two years) to low ED users, Peppe et al. found that among high ED users, 27% were
below the 100% federal poverty line (FPL) compared to 16% of low ED users (2007). Though frequent users consist of only about 1% of all ED users, they account for 18% of ED visits (NCHS, 2013). Research has also found that high ED users use outpatient patient care services at a higher rate compared to low ED users, suggesting that these patients need more health services overall (Peppe et al., 2007).

Patients with **chronic conditions** are also more likely to be frequent users of the ED (Peppe et al., 2007; Choi et al., 2012). Peppe et al. found that 84% of high ED users live with chronic conditions (2007). Among these patients with chronic conditions, those with both **chronic mental and physical conditions**, such as addiction and chronic pain, respectively, were the most likely to be high ED users (Peppe et al., 2007). In a study looking at 1,537 patients identified as being super-users of hospitals and emergency visits, 59% has at least two chronic conditions (Harris et al., 2016).

Chronic conditions are often associated with **depression**, and studies have shown that depression is also associated with high ED use. In a cross-sectional study done by Meltzer, Bregman, and Blanchard, patients with non-specific abdominal pain with a history of four or more visits in a 365-day period were screened using the Patient Health Questionnaire (PHQ-9) and placed into one of three categories: no depression (PHQ-9 ≤ 5), mild depression (5 < PHQ-9 < 10), or moderate/severe depression (PHQ-9 ≥ 10) (2014). They found that 61% of patients with moderate or severe depression had at least one ED visit for abdominal pain compared to 29.2% of patients with no depression (Meltzer, Bregman, and Blanchard, 2014). Moderate to severe depression was associated
with repeat ED use among patients with non-specific abdominal pain was associated with (Meltzer, Bregman, and Blanchard, 2014).

Chronic **depression and pain** oftentimes occur together. Thirty to forty percent of patients with chronic pain have chronic depression (Holmes, Christellis, and Arnold, 2012). Depression in patients diagnosed with chronic pain is associated with decreased function, poorer response to treatment, increased health care costs, and decreased quality of life (Holmes, Christellis, Arnold, 2012; Lerman et al., 2015). Depression can worsen physical illness and physical symptoms, such as pain and discomfort (Choi et al., 2012). A study looking at the relationship between the severity of depression and ED visits of low-income homebound older adults from a telehealth problem-solving therapy, found positive associations between ED visit frequency and higher depression scores (Choi et al, 2012). The most common self-reported reason for the ED visit was relief from pain and for poor self-care, e.g. breathing problems, high blood pressure, hyperglycemia (Choi et. al, 2012). These results indicate that education of self-management, especially for pain, might have prevented an ED visit (Choi et. al, 2012).

**Evidence-based Integrative Medicine and Pain**

There has been a growing interest in the use of integrative medicine to improve a patient’s self-management of pain. Evidence-based integrative medicine “emphasizes the combination of both conventional and alternative approaches to address the biological, psychological, social and spiritual aspects of health and illness” (UCSF, 2012). The “alternative approaches” refer to complementary and alternative (CAM) medicine, which
emphasizes a holistic approach to treating a person. Examples of CAM approaches are massage, meditation, yoga, and chiropractic and osteopathic manipulation.

About one-third of Americans use CAM techniques (NHIS, 2014). CAM techniques are widely used to address pain. Mindfulness-based interventions (MBI), such as meditation, have grown in popularity as a treatment to replace or complement conventional medicine for treating pain. The literature shows that MBIs are associated with reduction in pain symptoms, decreased pain intensity, and/or improvement of depressive symptoms (Chiesa and Serretti, 2011; Reiner and Lipsitz, 2013; la Cour and Peterson, 2015). In a randomized control trial (RCT) conducted by la Cour and Petersen, mindfulness meditation was associated with better mental quality of life (psychological well-being), feeling in control of pain, and higher pain acceptance (2015).

Research also suggests that massage therapy and acupuncture can be an effective treatment to chronic pain. In a pilot RCT comparing massage to standard treatment of care (STC) to address chronic pain, massage showed to be as effective as STC in improving pain, depression, and anxiety (Walach, Guthlin, and Konig, 2003). Moreover, the improvements lasted longer in the massage group (Walach, Guthlin, and Konig, 2003). A systematic review on massage therapy showed varying levels of improvement of chronic pain (Tsao, 2007). In a systematic review of RCTs of acupuncture on chronic pain, acupuncture was found to be an effective treatment (Vickers et al., 2012).
**Integrative Medicine Group Visit Model**

The Integrative Medicine Group Visit (IMGV) model is a patient-centered model that was developed by the Program for Integrative Medicine and Health Care Disparities at Boston Medical Center. The goal of IMGV is “to address patient needs in a comprehensive manner by incorporating patient-centered strategies, improving adherence to chronic care management, and improving health and coping” (Gardiner et al., 2014). The IMGV model consists of ten 2.5-hour sessions; and in each session, patients are taught various non-pharmacologic strategies to reduce their pain or depression.

The IMGV model combines mindfulness-based stress reduction (MBSR), evidence-based complementary medicine (EBCM), and group medical visits (Gardiner et al., 2014). MBSR uses mindfulness meditation to promote awareness of “moment-to-moment experience of perceptible mental processes” (Grossman et al., 2004). The approach has been utilized to help those with chronic conditions cope and manage their suffering (Grossman et al., 2004). These conditions include chronic pain, depression, and anxiety. Combining standard of care with EBCM, such as yoga, massage therapy, and acupuncture has been shown to be safe and effective in addressing chronic conditions (Gardiner et al., 2014).
The group visit model started in the 1970s for pediatric patients, but has become more widely used for patients with chronic disease (Geller et al., 2011; Geller et al., 2015). Improved patient and provider satisfaction and reductions in hospital admission, ED utilization, specialist utilization, and overall medical utilization have been associated with attendance of group visits (Geller et al., 2015). IMGV combines these three elements – MBSR, EBCM, and group visits – in an effort to provide holistic care and create an individualized treatment plan for each patient.

In a pre-post study assessing IMGV feasibility, IMGV was associated with a significant decrease in emergency room utilization (Gardiner et al., 2014; Shaw et al., 2014). Figure 2 shows how ED utilization decreased during the intervention. IMGV was also found to be significantly associated (clinically and statistically) with an improvement in depression (Gardiner et al., 2014).
In 2014, the Program for Integrative Medicine and Health Care Disparities began a RCT to assess the IMGV model on low-income, adult patients diagnosed with chronic depression and pain. The RCT is still ongoing and will end in December 2016. For this study, we are using randomization, and comparing between an intervention (IMGV) group and control (standard of care) group.

Reducing ED Utilization and the IMGV Model

Other models of care are needed to address emergency care and the needs of patients who are at risk for being frequent users of the ED. Some elements that might lead to a reduction of ED utilization are more coordinated patient care, focus on preventions, and more accessible hours to primary care, such as extending health center
hours (GAO, 2011). Interventions such as improved care coordination and health information technology for care transition have been implemented (Castillo et al., 2014).

As mentioned previously, a study by Peppe et al., found that among patients who reported having chronic conditions, those with both physical and mental chronic conditions were the most likely to be high ED users (2007). Patients with these types of conditions are the target patient population of the Integrative Medicine Group Visit Study.

Though IMGV has been associated with changes in pain and depression measures, there is a lack of research studies looking at the relationship of IMGV to other aspects of healthcare, such as the ED visits. The study aims to address this issue by looking at ED utilization patterns among participants in the IMGV study. By correlating reduced ED utilization with IMGV, we hope to show that IMGV can have a positive impact on ED utilization, and thus lead to costs-savings for the US health system and patients.
OBJECTIVES

In order to determine if Integrative Medical Group Visits (IMGV) affect emergency department (ED) utilization in adult patients diagnosed with chronic pain and depression from an urban safety-net hospital population. Specifically:

1) Data regarding frequency of ED utilization will be collected from the Integrative Medical Group Visits (IMGV) randomized clinical trial dataset. Candidates who were enrolled into the study at the three sites will be selected for analysis.

2) Data extracted from electronic medical records (EMR), specifically participants’ emergency department (ED) utilization from 90 days before the start of the study to 9 weeks after the beginning of the study, will be examined.

3) The results will be analyzed with the use of the SAS software. Descriptive statistics of participants who used the ED will be generated. A two-sample t-test will be used to compare the ED use of participants in the intervention group to those in the control group.

4) Furthermore, results will be analyzed by treatment group and by visits that were preventable or non-preventable.

These studies should demonstrate a correlation, if any, between IMGV (the treatment), and a lower frequency of ED utilization. We hope these studies will shed light on the role IMGV can have on ED utilization for adult patients with chronic pain and depression.
METHODS

Study Design

This study is a secondary database analysis of participants enrolled in the Integrative Medical Group Visits (IMGV) randomized controlled trial (RCT), being conducted at Boston Medical Center’s Program for Integrative Medicine and Health Care Disparities. The RCT is two-armed, with one intervention and one control arm. The RCT began in April 2014 and will be complete in December 2016. The medical chart review is part of the RCT, and was approved by the Boston University Medical Center Institutional Review Board.

Setting

The participants are from 3 sites: Boston Medical Center (BMC), Codman Square Health Center (CSHC), and Dot House Multiservice Center (DHMC). BMC is a 496-bed hospital and is the largest safety-net hospital in New England. Over half (59%) of the patient population are from underserved populations, and 30% do not speak English as their first language. CSHC and DHMC are both outpatient urban community clinics in Boston and are affiliated with BMC through a Federally Qualified Health Center collaboration, called Health Net collaboration. Our analysis for the medical chart review is only looking at participants’ emergency visits to BMC’s Emergency Department and not accounting for ED visits that took place at other medical institutions. In part because of the proximity of BMC to the community clinics and their affiliation with BMC, patients from CSHC and DHMC who need emergency care usually go to BMC.
**Participants**

The research subjects of this analysis are part of the IMGV RCT, which is still ongoing. They seek primary care at one of the three sites just previously mentioned. Patients were referred to the study by their primary care providers (PCPs), through posted fliers at the one of the clinic sites, and/or letters the research personnel sent on behalf of PCPs. Some PCPs did a “warm hand off” of their eligible patients to a research assistant (RA). Additionally, the research team also spoke at provider meetings to share about the study’s aims.

The inclusion criteria were being at least 18 years old, having a primary care provider at one of the three sites, reporting a pain level score ≥ 4 on a 0-10 scale, having a score ≥ 5 (indicating at least mild depression) on the Patient Health Questionnaire (PHQ)-9, and able to comprehend English to provide research consent. The exclusion criteria included psychosis, having a medical condition or other circumstances that might prevent attendance of IMGV visits, having begun a new pain treatment in the last month or are planning to in the next three months, having an active alcohol or drug disorder, involved in a workman’s compensation or personal injury lawsuit, pregnant or planning to pregnant, and being suicidal.

After RAs obtained verbal consent, patients were screened over the phone or in-person. Those who were found eligible were invited to an in-person appointment to with an RA of the study. During the in-person appointment, the RA provided more information about the research study and obtained written consent for participation, including reviewing of their medical records. After the participants gave consent,
baseline data was collected. Participants were randomized using the StudyTrax software into the control (standard treatment of care) group or treatment (IMGV) group. All participants are randomized within the two treatment conditions using permuted blocks of sizes 2, 4, and 6 and specific to both the site and cohort- i.e. first group at BMC. The RA then gave materials and more information about the participant’s assigned group.

**Intervention: Integrative Medicine Group Visits**

The intervention consists of 10 IMGV sessions over 21 weeks. The first nine sessions occur in the first nine weeks and are known as the treatment phase, where participants were taught using an IMGV curriculum. After Session 9, a 9-week survey was administered by RAs. The remaining twelve weeks are known as the maintenance phase, and includes Session 10, which occurs in the last week. Outcome data was collected after Session 10.

Each IMGV session was led by one physician facilitator and one meditation or yoga facilitator experienced in MBSR and motivational interviewing. During a session, participants learn non-pharmacologic strategies to reduce their pain and depression, such as yoga and mediation, and strategies to improve their overall health, such as healthy eating and sleeping habits. Each group had 8-12 participants, and participants were encouraged to collectively share their experiences with pain, depression, and IMGV. IMGV sessions took place at each of the study sites.

Additionally, participants were provided with a Dell tablet for the duration of the study. Using the tablet, participants accessed “Gabby,” an avatar that acted as a patient
advocate. Participants were also given access to the Our Whole Lives (OWL) study website that had weekly activities associated with that week’s lesson, provided information on CAM techniques, community resources, and had an online forum for study participants to share knowledge and testimonials with each other. The OWL website could be accessed on the study tablet and any device with Wifi.

**Control: Standard Treatment of Care**

The control group consisted of standard of care. It was assumed that control participants would utilize healthcare resources and seek primary care in the same fashion. Research assistants did not schedule any appointments for them. After 9 weeks, a 9-week survey was administered by RAs. After 21 weeks, outcome data was collected.

**Medical Chart Review**

A request was submitted to the BMC Clinical Data Warehouse (CDW) to extract ED utilization data from the electronic medical records of study participants who had completed Session 9. BMC utilizes electronic health record software called Epic. Although participants can attend ED’s in any hospital or medical center of their choice, only emergency visits made to the BMC Emergency Department were included in this analysis. The reason for this is because BMC uses Epic for their electronic medical record system, and thus, only ED data from Epic was included in the study.

The primary outcomes of interest for this analysis were the ED encounters that took place during two different time sets: (1) 90 days before the Session 1 date and (2)
Session 1 to the Session 9 date. The extracted ED encounter information included the date of the ED visits, chief complaint(s), and discharge diagnoses. The extracted information was organized with the use of Microsoft Excel, and subdivided by the time set. An ED encounter was categorized as either being “preventable” or “non-preventable” based on the diagnoses. A preventable emergency visit (PEV) was defined as a case in which patients could have sought care or treatment in a primary care setting. A non-preventable emergency visit (NPEV) was defined as a case in which an emergency visit was necessary and/or unavoidable, or a patient having a condition in which it would not be safe to be in a primary care setting.

When additional information was needed to categorize the encounter, the encounter was viewed on the patient’s medical chart. The RA would then look at the patient’s medical history and the notes made by the clinical personnel who saw the patient during his or her ED visit. All ED cases were crosschecked with the patient’s medical record. All cases were also reviewed with the Principal Investigator (PI), a practicing physician trained in Family Medicine. The PI reviewed each case, reviewed the ED notes and the medical diagnosis of the discharged, and confirmed the designation of whether an ED counter was a PEV or NPEV. To minimize bias, research personnel were blinded as to whether participants who made ED visits were of the control or intervention group.
**Statistical Analyses**

Statistical analyses were conducted using SAS Version 9.3. Descriptive statistics of participants who used the ED were obtained. ED utilization was analyzed by treatment group and whether they were categorized as PEV or NPEV. A two-sample t-test was used to compare the ED utilization of the control and intervention group.
RESULTS

The study sample consisted of 31 study participants at baseline. The average age for study participants was 48 years old (SD=8.7). Eighty-four percent of participants were female and 16% were male. A majority were Black (74%), followed by Other (19%) and White (7%). Almost half (42%) have an annual income of less than $10k. Twenty-three percent answered as Refused/Don’t know. Fifteen participants (48%) were randomized in the intervention group, and 16 (52%) were in the control group. Eighty-one percent reported the use of pain medication in the seven days prior to the baseline survey. Twenty-two participants (71%) made at least one visit to the emergency room in the 90 days before Session 1. Eighteen individuals had at least one preventable emergency visit (PEV). In Table 1, the characteristics of study participants at baseline are summarized.

Of those randomized into the intervention group, 80% were female and 20% were male. Sixty-percent were Black, 26% were Other, and 7% were White. The annual income of participants ranged from less than $5K to $74.99K. Twenty percent had less than $5K, 20% were in the income group of $5K-9.99K, 27% in the $10K-$29.99K group, and 13% in the $30K-74.99K. There were no intervention participants who reported an annual income of $75K or more. Twenty percent refused to answer or did not know their annual income. Seventy-three percent (11) reported the use of pain medication in the seven days prior to the baseline survey. Eighty-seven percent of intervention participants (13) made an ED visit in the ninety days before Session 1. Sixty-seven percent of intervention participants (10) made at least PEV. Thirty-three percent (5) made a NEPV and/or made no emergency visit at all.
Of those randomized into the control group, 88% were female and 12% were male. Eighty-one percent were Black, 13% were Other, and 6% were White. The annual income of the control participants who reported their annual income ranged from less than $5K-$75K or more. A majority of control participants had an annual income between $5K-$10K. Thirteen percent of participants reported an annual income of less than $5K, 19% reported $10K-$29.99K, 6% reported $30K-$74.99K, and 6% reported $75K or more. Twenty-five percent refused to answer or did not know their annual income. Eighty-eight percent (14) reported the use of pain medication in the seven days prior to the baseline survey. Fifty-six percent of control participants made an ED visit in the 90 days before Session 1. Fifty percent of participants had at least one PEV. The intervention and control group had similar characteristics at baseline. Table 2 compares the baseline characteristics by intervention and control group.

At baseline, 22 of the 31 participants made at least one visit to the emergency department in the 90 days before Session 1. At 9-weeks, 14 of the 26 participants made at least one ED visit (Figure 3). From baseline to the 9-week mark, the number of participants who had at least one ED visit decreased for the intervention group (13 to 4), but increased for the control group (9 to 10). Figure 4 shows this change between the two time sets. The results were also analyzed by visits. At baseline, there were a total of 27 ED visits; and at 9-week, the number of visits decreased to 17 visits. From baseline to 9-weeks, the number of visits made among intervention participants decreased from 16 to 5. For visits made by control participants, the number of visits increased from 11 to 12 (Figure 5).
Table 1. Baseline Characteristics of Study Participants. At baseline, there were a total of 31 participants. The participants are described by their for age, gender, race, income, pain medication used in the last 7 days, ED visit, including whether the visit was preventable or not, at baseline.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Baseline (N=31)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (26-64)</td>
<td>μ= 48 (SD=8.7)</td>
</tr>
<tr>
<td>Gender</td>
<td>n   %</td>
</tr>
<tr>
<td>Female</td>
<td>26  84</td>
</tr>
<tr>
<td>Male</td>
<td>5   16</td>
</tr>
<tr>
<td>Race</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>2   7</td>
</tr>
<tr>
<td>Black</td>
<td>23  74</td>
</tr>
<tr>
<td>Other</td>
<td>6   19</td>
</tr>
<tr>
<td>Income</td>
<td></td>
</tr>
<tr>
<td>Less than $5K</td>
<td>5   16</td>
</tr>
<tr>
<td>$5-$9.99K</td>
<td>8   26</td>
</tr>
<tr>
<td>$10K-$29.99K</td>
<td>7   23</td>
</tr>
<tr>
<td>$30K-$74.99K</td>
<td>3   9</td>
</tr>
<tr>
<td>$75K or more</td>
<td>1   3</td>
</tr>
<tr>
<td>Refused/Don’t know</td>
<td>7   23</td>
</tr>
<tr>
<td>Treatment Group</td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td>15  48</td>
</tr>
<tr>
<td>Control</td>
<td>16  52</td>
</tr>
<tr>
<td>Pain medication used in the past 7 days</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>25  81</td>
</tr>
<tr>
<td>No</td>
<td>6   19</td>
</tr>
<tr>
<td>ED Visit</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>22  71</td>
</tr>
<tr>
<td>No</td>
<td>9   29</td>
</tr>
<tr>
<td>Preventable Visit</td>
<td></td>
</tr>
<tr>
<td>Yes, at least one preventable emergency visit</td>
<td>18  58</td>
</tr>
<tr>
<td>No, no preventable emergency visit *</td>
<td>13  42</td>
</tr>
</tbody>
</table>

*"No, no Preventable Emergency Visit” includes those who made a non-preventable emergency visit and/or made no visit at all.
Table 2. Baseline Characteristics by Treatment Group. Intervention and control patients were analyzed at baseline separately for age, gender, race, income, pain medication used in the last 7 days, ED visit, including whether the visit was preventable or not. By these variables, the intervention and control group had similar characteristics at baseline.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intervention (N=15)</th>
<th>Control (N=16)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (26-64)</td>
<td>μ= 50 (SD=9.1)</td>
<td>μ= 47 (SD=8.3)</td>
<td>0.26</td>
</tr>
<tr>
<td>Gender</td>
<td>n %</td>
<td>n %</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>12 80</td>
<td>14 88</td>
<td>0.57</td>
</tr>
<tr>
<td>Male</td>
<td>3 20</td>
<td>2 12</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td>0.60</td>
</tr>
<tr>
<td>White</td>
<td>1 7</td>
<td>1 6</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>10 67</td>
<td>13 81</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>4 26</td>
<td>2 13</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
<td>0.81</td>
</tr>
<tr>
<td>Less than $5K</td>
<td>3 20</td>
<td>2 13</td>
<td></td>
</tr>
<tr>
<td>$5-$9.99K</td>
<td>3 20</td>
<td>5 31</td>
<td></td>
</tr>
<tr>
<td>$10K-$29.99K</td>
<td>4 27</td>
<td>3 19</td>
<td></td>
</tr>
<tr>
<td>$30K-$74.99K</td>
<td>2 13</td>
<td>1 6</td>
<td></td>
</tr>
<tr>
<td>$75K or more</td>
<td>0 0</td>
<td>1 6</td>
<td></td>
</tr>
<tr>
<td>Refused/Don’t know</td>
<td>3 20</td>
<td>4 25</td>
<td></td>
</tr>
<tr>
<td>Pain medication used in past 7 days</td>
<td></td>
<td></td>
<td>0.32</td>
</tr>
<tr>
<td>Yes</td>
<td>11 73</td>
<td>14 88</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>4 27</td>
<td>2 12</td>
<td></td>
</tr>
<tr>
<td>ED Visit</td>
<td></td>
<td></td>
<td>0.06</td>
</tr>
<tr>
<td>Yes</td>
<td>13 87</td>
<td>9 56</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>2 13</td>
<td>7 44</td>
<td></td>
</tr>
<tr>
<td>Preventable Visit</td>
<td></td>
<td></td>
<td>0.35</td>
</tr>
<tr>
<td>Yes, at least one preventable emergency visit</td>
<td>10 67</td>
<td>8 50</td>
<td></td>
</tr>
<tr>
<td>No, no preventable emergency visit *</td>
<td>5 33</td>
<td>8 50</td>
<td></td>
</tr>
</tbody>
</table>

**"No, no Preventable Emergency Visit” includes those who made a non-preventable emergency visit and/or made no visit at all.**
Figure 3: Number of Participants Who Made at Least One ED Visit. At baseline, 22 of the 31 participants made at least one visit to the emergency department in the 90 days before Session 1. At 9-weeks, 14 of the 26 participants made at least ED visit.

Figure 4: Number of Participants Who Made at Least One ED Visit, by Treatment Group. From baseline to 9-weeks, the number of participants who had at least one ED visit decreased for the intervention group, but increased for the control group.
Figure 5: Number of Visits, by Treatment Group. From baseline to 9-weeks, the number of visits decreased among intervention participants but increased among control participants.

A two-sample t-test was conducted to test for a statistically significant difference in the ED utilization of the intervention and control patients from baseline to 9-weeks. Individual differences of ED visits were taken between the baseline and 9 week (i.e. the number of ED visits at 9 weeks for Person X minus the number of ED visits at baseline for Person X, etc.). After the individual differences within a treatment group were taken, the mean of all the differences were taken to obtain the mean difference of the treatment group. The mean difference of ED visits for those in the control group was 0.06 (SD=1.18) and for those in the intervention group was -0.73 (SD=1.16). These results suggest that on average, the intervention group had a lower number of ED visits at 9 weeks than they did at baseline.
Table 3: Two-sample T-test Comparing ED Utilization by Treatment Group.
Control and intervention groups were assessed for differences in ED utilization. The negative mean for the intervention group reveal that intervention participants had overall lower ED use from baseline to 9-weeks.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Std Err</th>
<th>Min</th>
<th>Max</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED Utilization Difference</td>
<td>Control</td>
<td>16</td>
<td>0.0625</td>
<td>1.1815</td>
<td>0.2954</td>
<td>-2.0000</td>
<td>2.0000</td>
<td>0.0690</td>
</tr>
<tr>
<td></td>
<td>Intervention</td>
<td>15</td>
<td>-0.7333</td>
<td>1.1629</td>
<td>0.3003</td>
<td>-3.0000</td>
<td>2.0000</td>
<td></td>
</tr>
</tbody>
</table>

The ED visits were also analyzed by their classifications of being preventable or non-preventable. Of the 27 ED visits at baseline, 21 were classified as being a preventable emergency visit (PEV), and 6 were classified as being a non-preventable emergency visit (NPEV). Of the 17 ED visits at 9-weeks, the number of visits decreased for both PEVs (21 to 13) and NPEV (6 to 4). Figure 6 depicts the reduced ED utilization during the study period.

Figure 6: Number of Visits, by Preventable v. Non-Preventable ED Visits. Both preventable and non-preventable ED visits decreased from baseline to 9-weeks. This figure is based on the entire sample.
DISCUSSION

This study is the first of its kind to evaluate the effectiveness of the Integrative Medicine Group Visit model on emergency department utilization. In this study, we assessed ED utilization among adult patients diagnosed with chronic pain and depression among an urban safety-net population. ED utilization was compared among patients who participated in IMGV compared to those in standard of care. Our results demonstrate that there is potential for the IMGV model to reduce overall ED utilization. From baseline to 9-weeks, the number of participants who had at least one ED visit decreased for the intervention group (13 to 4), compared to the control group, which slightly increased (9 to 10). We observed a similar trend when the number of visits was analyzed by treatment group. The number of ED visits decreased among intervention patients from 16 to 5, but a slight increase was observed for visits made among control participants (11 to 12). The IMGV model also has the potential to reduce the number of preventable ED visits, revealed by the decrease of 21 PEVs at baseline to 13 PEVs at 9-weeks.

Furthermore, though the results of the statistical analyses were not considered statistically significant because of the small sample size, participants in the intervention group did have less ED visits, less preventable ED visits, and less non-preventable visits from baseline to 9-weeks than participants in the control group. These results may reveal that the intervention treatment has clinical significance and over time, may reduce ED visits, reduce preventable ED visits, and reduce non-preventable ED visits.

The current study did have a few limitations. One limitation was the generalizability of the study. The data were from patients in the IMGV RCT, and
therefore the results cannot be generalized to patients who were found ineligible for the study. This includes patients who had did not have a high enough BPI severity or interference score or depression score, or patients who had symptoms of psychotic illness. Furthermore, since IMGV visits took place on weekdays in the afternoon, people who may have been eligible for the study but had full-time jobs could not be enrolled into the study. Also, the ED utilization from our study sample may be higher than what would be found if using a different study sample. The characteristics of our study participants are demonstrated through the literature as already being associated with high ED utilization. Low-income (Peppe et al., 2007), chronic conditions (Peppe et al., 2007; Choi et al, 2012), at least two chronic conditions (Harris et al., 2016), and moderate or severe depression (Meltzer, Bregman, and Blanchard, 2014) are associated with high ED use. Another limitation was that there may be missing or incomplete ED data since this analysis only included ED visits from Boston Medical Center, and therefore ED visits at other hospitals were not captured. Lastly, urgent care was not captured.

The results of our study are consistent with the literature that integrative medicine and the components that make up the IMGV model – mindfulness-based stress reduction (MBSR), evidence-based complementary medicine (EBCM), and medical group visits – are associated with positive health benefits. MBSR has been associated with reduced anxiety, greater vitality, improved mental QOL, and greater ability to control pain (La Cour and Peterson, 2015). Geller et al., found that group visits were associated with improved patient and provider satisfaction and reductions in hospital admission, ED utilization, specialist utilization, and overall medical utilization (2015). IMGV, with its
focus on the whole patient and self-management, especially for pain, has the potential to prevent ED utilization for patients who are diagnosed with chronic pain and depression from an urban safety-net population.

IMGV implementers might consider a session of how to identify when one should go to the PCP or seek urgent care or emergency care as a component of the IMGV curriculum. Doing so may lower the number of preventable ED visits that patients make. This is especially important for patients of chronic pain and depression, who health conditions put them at risk for being ED users. More research is needed into the aspects of IMGV, and the mechanism of how it can lead to lower ED utilization for preventable or non-life threatening reasons.
APPENDIX

Appendix 1: BMC Clinical Data Warehouse (CDW) Form

Research Assistant submitted the following request to the Clinical Data Warehouse on February 17, 2016.

1) Please provide the following information about your request
   - Type of request: Other
   - Brief description: We are requesting the following information from the electronic medical records of the IMGV RCT research participants – problem lists, medications, vitals, and healthcare utilization, including emergency department utilization and hospital utilization.
   - Selection criteria: Participants who are/were enrolled into the IMGV RCT, being conducted by the Program for Integrative Medicine and Health Care Disparities.
   - Dates of required records: Please see attached Excel workbook, spreadsheet 1 titled “IMGV_Patient Information_Final.xlsx.”
   - Data fields required (list the fields required from the electronic database): Please see attached Word Document titled “IMGV_CDW Request Info_Final.docx.”

2) Contact information for the person who will be working with CDW for this data request
   - Will you be the main person? No
   - Main person’s name: Anna Lestoquoy
   - Role in the study: Research Study Coordinator
   - E-mail address: Anna.Lestoquoy@bmc.org
   - Phone: (617) 414-2424
   - School: MED

3) PI Information
   - PI the main person working with the CDW? No
   - PI’s School: MED
   - Does the PI have an eRA Commons name?* Yes, pgardiner
4) Study Information

- Has this study been submitted to the IRB for review? Yes
- Study name/project title: Integrative Medicine Group Visits: A Randomized Controlled Trial (Protocol H-33096)
- For funded projects, please indicate funder here: PCORI
- Funder grant or project number: PCORI number: AD-1304-6218
- BUMC or BMC grant/account number: 0343303
- Which grant office do you typically use? BMC grants administration
- Are funds available to pay for this data analysis project? * Yes
- If funds are available to pay, please indicate funding source: BMC account
- Name of administrative contact to arrange payment *Anna Sophia Lestoquoy/Elta Etienne
- Administrative contact’s e-mail address? Anna.lestoquoy@bmc.org/elta.etienne@bmc.org

5) Student/Trainee Research

- Is the study that will be the subject of this data request be student/trainee research? That is, the study is being conducted to provide research experience or to satisfy a program requirement for a student or trainee (includes residents and fellows).* Yes
- Is the student/trainee the same person as the PI identified in Section 3? No
- Faculty Advisor Name: Dr. Vickery Trinkaus-Randall
- Type of student/trainee: Student/Masters
- Trainee’s School: GMS
- Research is required by: Training program
- If research is required by a training program, please describe: As part of the MS Medical Sciences program, every student has to complete a thesis. The student, Racquel Enad, will only be using a subset of the clinical data for her research thesis. (All the clinical data will be used as part of the Integrative Medicine Group Visits: A Randomized Controlled Trial.)

6) If this is your first time requesting data from the CDW, please let us know how you heard about this service.

- Members of the IMGV Study’s Scientific Advisory Group have requested data from the CDW before, and they suggested we use this service for our chart review.
Appendix 2: Additional Documentation for CDW Request

The following information was included with the submission of the CDW Request.

**Diagnoses on problem list at Session 1 Date:** The problems that have not yet been resolved by Session 1, sorted vertically by individual patient and horizontally by ICD codes and words.

**Vitals:** The weight (kg or lb.), height (cm or in.), and pain score (0-10) at Session 1, Session 9, and Session 10, or nearest appointment dates. Please include the appointment dates from where the information is obtained. If using the nearest appointment(s), please include the appointment date(s).

**Medication Lists:** The medication lists at Session 1, Session 9, and Session 10, or nearest appointment dates. Please include the appointment dates from where the information is obtained. Please sort vertically by individual patient and horizontally by ICD codes and words.

Please also look back one month before each of the listed dates to compare medications, and include this date also.

**Emergency Department (ED) Utilization:** For each patient, the ED utilization from 3 months before Session 1 to 3 months after Session 10, sorted into the four following timeframes:

1. 3 months before to Session 1
2. Session 1 to Session 9
3. Session 9 to Session 10
4. Session 10 to 3 months afterward

For each timeframe, please indicate the total number of ED visits per patient. For each ED visit, please include date of admission, date of discharge, reason for admission/chief complaint, ICD code(s), and discharge diagnosis or procedural codes.

**Hospital Admissions:** For each patient, the hospital admissions from 3 months before Session 1 to 3 months after Session 10, sorted into the four following timeframes:

1. 3 months before to Session 1
2. Session 1 to Session 9
3. Session 9 to Session 10
4. Session 10 to 3 months afterward
For each timeframe, please indicate the total number of times admitted into the hospital. For each hospital admission, please include date of admission, date of discharge, reason for admission, ICD code(s), and discharge diagnosis or procedural codes.

**Outpatient appointments:** For each patient, the total number of outpatient visits from 3 months before Session 1 to 3 months after Session 10, sorted into the four following timeframes:
1. 3 months before to Session 1
2. Session 1 to Session 9
3. Session 9 to Session 10
4. Session 10 to 3 months afterward
For each appointment, please include the “Service Area” from registration and billing, and the appointment date.

**Urgent Care (for CPS patients):** For each patient, the total number of urgent care visits from 3 months before Session 1 to 3 months after Session 10, sorted into the four following timeframes:
1. 3 months before to Session 1
2. Session 1 to Session 9
3. Session 9 to Session 10
4. Session 10 to 3 months afterward

**Acupuncture appointments:** For each patient, the total number of acupuncture appointments from 3 months before Session 1 to 3 months after Session 10, sorted into the four following timeframes:
1. 3 months before to Session 1
2. Session 1 to Session 9
3. Session 9 to Session 10
4. Session 10 to 3 months afterward
Providers who perform acupuncture at the study sites:
- BMC: Ellen Highfield, María Broderick, CJ Allen, and Beth Sommers
- Codman:
- DotHouse:

**Massage appointments:** For each patient, the total number of massage visits 3 months before Session 1 to 3 months after Session 10, sorted into the four following timeframes:
1. 3 months before to Session 1
2. Session 1 to Session 9
3. Session 9 to Session 10
4. Session 10 to 3 months afterward

Providers who do massages at the study sites:
- BMC: Bonita Jones
- Codman:
- DotHouse:

**Chiropractic/Osteopathic Medicine appointments:** For each patient, the total number of Chiropractic/Osteopathic Medicine visits appointments 3 months before Session 1 to 3 months after Session 10, sorted into the four following timeframes:
   1. 3 months before to Session 1
   2. Session 1 to Session 9
   3. Session 9 to Session 10
   4. Session 10 to 3 months afterward

Chiropractors and Osteopathic Physicians (DO) at the study sites:
- BMC: Douglas Comeau
- Codman:
- DotHouse:

**Nutrition appointments:** For each patient, the total number of nutrition appointments 3 months before Session 1 to 3 months after Session 10, sorted into the four following timeframes:
   1. 3 months before to Session 1
   2. Session 1 to Session 9
   3. Session 9 to Session 10
   4. Session 10 to 3 months afterward

Providers who do nutrition appointments at the study sites:
- BMC:
- Codman:
- DotHouse:

**Behavioral health appointments:** For each patient, the total number of behavioral health appointments 3 months before Session 1 to 3 months after Session 10, sorted into the four following timeframes:
   1. 3 months before to Session 1
   2. Session 1 to Session 9
   3. Session 9 to Session 10
4. Session 10 to 3 months afterward

Behavioral health providers at the study sites:
- BMC: Author Search for Therapist or Social Worker (MSW)
- Codman:
- DotHouse:

**Pain Specialist appointments:** For each patient, the total number of pain specialist appointments 3 months before Session 1 to 3 months after Session 10, sorted into the four following timeframes:
1. 3 months before to Session 1
2. Session 1 to Session 9
3. Session 9 to Session 10
4. Session 10 to 3 months afterward

Pain specialists at the study sites:
- BMC: Author search for “Anesthesiologist” or “Neurologist,” Dept. Specialty “Pain Med”
- Codman:
- DotHouse:

**Physical and Occupational Specialist appointments:** For each patient, the total number of physical and occupational specialist appointments 3 months before Session 1 to 3 months after Session 10, sorted into the four following timeframes:
1. 3 months before to Session 1
2. Session 1 to Session 9
3. Session 9 to Session 10
4. Session 10 to 3 months afterward

Physical and occupational specialists at the study sites:
- BMC:
- Codman:
- DotHouse:
REFERENCES


35

http://doi.org/10.1089/107555303771952181
CURRICULUM VITAE

RACQUEL ENAD

Washington, D.C Metro • 209.658.9477 • renad@bu.edu • Birth Year: 1988

EDUCATION

Boston University School of Medicine
MS Medical Sciences Candidate

Boston University School of Public Health
MPH Global Health Candidate

Stanford University
BA Human Biology, Concentration in Global Health

EXPERIENCE

World Vision
Design and Development Intern, Health Team
June 2016–Present

- Coordinates research study on the social work system and parasocial workforce in Ghana, Kenya, Swaziland, Uganda, and Zambia
- Supports the new business development for prepositioning of US-government funded global health projects

American Journal of Public Health (AJPH)
Student Think Tank Member
Dec 2015–Present

- Contributed to 4,000% increase in monthly visits made to AJPH
- Consults for AJPH’s marketing and communications to grow readership base
- Developing a social media toolkit for AJPH’s Campus Ambassador Program

Boston Medical Center (BMC), Integrative Medicine
Graduate Research Assistant
June 2015–Present

- Recruited and collected data for multi-site RCT on assessment of group visits for patients with chronic pain and depression from a safety-net hospital population
- Coordinated medical chart review process with BMC Clinical Data Warehouse
- Analyzed qualitative data of focus groups using NVIVO qualitative software

UC San Francisco, Bixby Center for Global Reproductive Health
Research Analyst
Oct 2012–June 2014

- Pilot tested and evaluated patient S&R health education tools in four Bay Area reproductive health clinics to improve health tools
- Prepared materials for LARC CME-accredited provider trainings and reproductive health conferences
- Contributed to an 83% participant response rate of 1,500 women for a cluster RCT
• Co-created a LARC patient education brochure used in 40+ Planned Parenthood clinics across the country
• Performed programming and external engagement duties, including representing Bixby at reproductive health conferences

**ABC’s for Global Health**  
Stanford, CA & Cebu, Philippines  
*Project Manager, Hypertension Education Research Project*  
June 2011–June 2012

- Led weekly meetings with Philippine clinical research faculty to collaborate on the project design and research proposal, which was successfully approved by the Stanford School of Medicine Institutional Review Board (IRB)
- Edited instrument tools and patient education materials
- Formed partnership with Cebu Institute of Medicine (CIM), and negotiated SOW
- Conducted training session for medical school residents involved with data collection

**Grandmothers Against Poverty and HIV/AIDS (GAPA)**  
Cape Town, South Africa  
*Development Intern*  
Mar 2010–July 2010

- Produced research and administrative materials to meet requirements for grant applications and reporting
- Created database for the 280 grandmothers’ demographic and health information
- Developed communication tools, e.g. video, photography, blogs for public distribution
- Created a volunteer training manual to orient new international volunteers on South African context and working for GAPA
- Facilitated peer health education workshops for HIV/AIDS-affected grandmothers

**Doctors Without Borders (MSF)**  
Cape Town, South Africa  
*Research Assistant, Obstetric Fistula Study*  
June 2010–July 2010

- Managed data of post-treatment surveys, used to determine appropriate intervention for fistula patients in Burundi and DRC

**Face AIDS National Team (Now part of Partners in Health)**  
Stanford, CA  
*Rwanda-U.S. Relations Team Member*  
Jan 2010–Mar 2010

- Co-authored a literature review on peer health education models to improve Face AIDS’ model on HIV/AIDS and safe sex peer health education for teenagers and young adults in Rwanda

**Visayan Forum Foundation, Inc.**  
Cebu, Philippines  
*Advocacy Intern*  
July 2009–Sept 2009

- Established Movement Against Trafficking and Advocacy (MATA), by facilitating partnerships with universities and technical schools in Cebu. In 2012, MATA consisted of 1,000+ university students
- Conducted presentations to faculty and students at 6 universities in Cebu to raise awareness on human trafficking and HIV/AIDS
- Mentored college students on anti-human trafficking initiatives, including campus awareness and planting student organizations
- Spearheaded the awareness campaign, War Against Human Trafficking (WAHT), which resulted in 10,000 attendees

**SEALNet Project Philippines**  
*Cebu, Philippines*  
*Team Lead of Leadership Development, Mentor*  
*Aug 2009–Sept 2009, Sept 2012*

- In 2009, co-led an international team on providing leadership workshops for 25 Filipino high school students
- In 2012, successfully facilitated partnership between SEALNet, University of Philippines Cebu, and Cebu Institute of Medicine
- Trained students on how to prepare health education lectures in communities
- Coordinated meals for SEALNet team members, while staying within the budget

**HONORS**

In November 2015, appointed by the *American Journal of Public Health (AJPH)* to join their 6-person student think tank to provide marketing and communications support. The team works directly with AJPH’s Editor-in-Chief.

In April 2011, received on-stage recognition at the *Clinton Global Initiative University Conference* for Growth Advocacy for Women Abroad (GAWA), a conceptual project I designed and developed with a peer. Of the 950 commitments represented at the annual conference, GAWA was one of eleven projects *(Top 1%)* recognized during the conference for demonstrating an exemplary approach to addressing an important social issue. The GAWA Project focused on providing social entrepreneurship opportunities and business training for Filipino domestic workers.

In January 2010, selected for *Stanford’s Haas Public Service Leadership Program*, aimed at developing public service leadership skills and knowledge to make effective social change.

**PAST EXTRA-CURRICULAR ACTIVITIES**

Stanford Haas Public Service Leadership Program, Rotaract Public Service Club (Professional Development Chair), Stanford Pre-Med Association (Board), Physician Shadowing (Emergency, CV, and Internal Medicine), Pilipino Youth Conference (“Sex Trafficking” Workshop Leader), Stanford Nonprofits Fellow, research on sex trafficking and HIV/AIDS in South Africa and the Philippines

**LANGUAGE PROFICIENCY:** Spanish (intermediate), French (beginning)