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FROM THE EDITOR

Research is an essential mission of any academic specialty. In its mission statement, the Philippine College of Emergency Medicine (PCEM) endeavors *"to innovate emergency medicine practice through research and continuing medical education"*

The Research and Academics Committee of the College is tasked to: *1) To plan, organize and implement scientific programs, seminars, and continuing medical education programs 2) To take the charge of research contests and provide incentives and proposals for research 3) To take charge of the official publication of the College*

In pursuit of these objectives, the Committee has conducted research workshops in 2013 and 2014 on protocol development to assist residents in conceptualizing and writing research proposals. Moreover, residents-in-training and consultants have been actively presenting research works in emergency medicine conferences both locally and internationally. During its annual convention, PCEM showcases interesting case reports done by residents. The Philippine Board of Emergency Medicine also organizes research symposium during the convention as a venue for new diplomats to present and be recognized for outstanding research endeavors.

To achieve its vision to be the national academic body composed of dedicated professional emergency medicine physicians oriented towards quality service; research and training in emergency care, working together towards global recognition, PCEM recognizes that it needs to generate new knowledge that will improve not only the delivery of emergency care in the Philippines but also contribute to the scientific knowledge in its clinical specialty. Focused areas of research are on resuscitation, quality management and pre-hospital care as well as improvement in the clinical management of acute coronary syndrome, trauma and stroke. Producing relevant researches will enhance the college's expertise in creating practice guidelines that impact on health care delivery both in the pre-hospital and emergency department. It is now poised to make remarkable contributions in tele-medicine and ultrasound.

Now, with the publication of its scientific journal, we hope to share with our colleagues in the medical profession the wealth of knowledge in emergency medicine that is not only innovative but transformative.

- Faith Joan Mesa-Gaerlan, MD, MS, FPCEM

PHILIPPINE JOURNAL OF EMERGENY MEDICINE (PJEM)

This is the official academic publication of the Philippine College of Emergency Medicine (PCEM). It shall contain original researches, case reports, systematic reviews, technical reports and other academic and completed research endeavors by health care professionals (emergency medicine physicians, emergency care nurses, emergency medical technicians and emergency department managers) involved in emergency care, disaster medicine and pre-hospital emergency care.

(PJEM Logo design by Dr. Amylene Luna)

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Case Report

A Case Series on Isolated Lead aVR ST-Segment Elevation

Clinical Significance and Outcome

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ABSTRACT:

Introduction: One of the least significant leads on a 12-lead electrocardiogram is the augmented right lead (aVR), as it is not as specific compared to the other leads. In this case series, the value of lead aVR, which is more often than not ignored, is highlighted. Three cases of aVR ST segment elevation on 12-lead electrocardiogram are described, with the end outcome of demise of all three patients. The importance of immediate revascularization is described to improve prognosis in this group of patients.

Objectives: This case series aims to primarily present under-reported cases of isolated aVR ST-segrment elevation myocardial infarction (STEMI), their course and outcome. More specific aims are to identify the criteria in determination of isolated aVR STEMI, know its clinical significance, and determine appropriate management for patients with this ECG finding.

***Case Presentation*:** A short review of previous studies, case reports, articles and guidelines from 2011-2016 were done. The author reviewed available literature, sorted out those that proved to be significant for the presented cases, and described them in conjunction with the aforementioned cases.

Case Discussion: Based on the limited information on these rare or under-reported cases, it was found that isolated aVR STEMI had a poorer prognosis that led to significant mortality and morbidity of patients. The significance of aVR ST-elevation was that of an occlusion of the left
coronary artery or a severe three-vessel disease in the presence of an Acute Coronary Syndrome. Guidelines from American Heart Association/American College of Cardiology Foundation in 2013 already recognized ST-elevation of lead aVR in isolation as a STEMI; hence, recommended that patients with this particular ECG finding should undergo reperfusion strategies to improve prognosis.

Conclusion: The indispensability of isolated aVR ST-segment elevation on ECG should alert physicians, especially emergency physicians, to the high probability of acute coronary syndrome with a very poor prognosis. If these patients are not promptly managed, demise may result with cardiogenic shock as the most probable cause. With this electrocardiogram finding, physicians must be quick to make clinical decisions to increase chances of survival of this group of patients.

INTRODUCTION

One of the 12 leads on a standard electrocardiogram, the aVR lead, has been frequently ignored since the discovery of the 12-lead ECG in the 19th century. Some physicians even refer to the ECG as the 11-lead ECG due to their belief that lead aVR is non-specific and rarely offers useful information.[1]

Through the years, the importance of this neglected lead has led some investigations with relatively good yield of information. It has been found that lead aVR has a very significant role in a variety of conditions such as Coronary Artery Disease, Acute Pericarditis, Tension Pneumothorax, and Pulmonary Embolism to name a few, apart from the most widely known use of this lead as being a marker for lead positioning or technical errors. But the most important discovery of its value is that of being an evidence for Myocardial Infarction.[1, 2] The diagnosis of acute myocardial infarction based on a 12-lead ECG finding of an isolated ST-segment elevation in aVR was frequently ignored as part of physician's training in Emergency Medicine[3] and even Internal Medicine.

Studies and case reports have proven that isolated aVR lead ST-elevation, or aVR and V1 ST-elevations are important parameters that need not be taken for granted in patients presenting with typical and atypical symptoms such as chest pain, diaphoresis, dyspnea, or hypotension, and other anginal equivalents. In patients with possible Acute Coronary Syndrome, the aforementioned 12-lead ECG findings may represent left main coronary artery disease, left anterior descending artery occlusion or sub-occlusion, severe three-vessel disease or subendocardial ischemia. [4,5,6]

CASE 1

A 58 year-old male came to the Emergency Department due to chest pain, which started three hours prior to consultation. The patient was awakened from sleep, with associated shortness of breath, diaphoresis and vomiting. This was the second episode of the same symptoms in the past two months. The patient had no known comorbidities, but was a thirty-five pack-year smoker and a daily alcoholic beverage drinker. On initial examination, the patient was seen in respiratory distress, diaphoretic, hypotensive with a palpatory blood pressure, but with clear breath sounds. Sensorium at this time was assessed to be GCS 11 (E2V3M6).

Initial 12-lead electrocardiogram shown in Fig.1 (a) revealed ST-segment elevation in aVR, with diffuse ST segment depressions in leads II, III, and aVF, V4, V5 and V6. Due to hypotension, the patient was started on Dopamine drip. The patient was also given Morphine 2 mg IV, ASA 80 mg/tab, 4 tabs per orem, and Ticagrelor 90 mg/tab, 2 tabs per orem. The patient was immediately referred to Cardiology Service. At this time, Norepinephrine drip was also started due to persistent hypotension. After 20 minutes, the patient's sensorium deteriorated and was subsequently intubated. On the 25th minute at the ED, the patient presented with sinus arrhythmias with premature ventricular contractions as shown in Fig. 1(b), progressing to junctional rhythms, then to pulseless electrical activity. ACLS was done for 30 minutes, which rendered futile. The patient was pronounced dead after a total of one hour of ED stay.

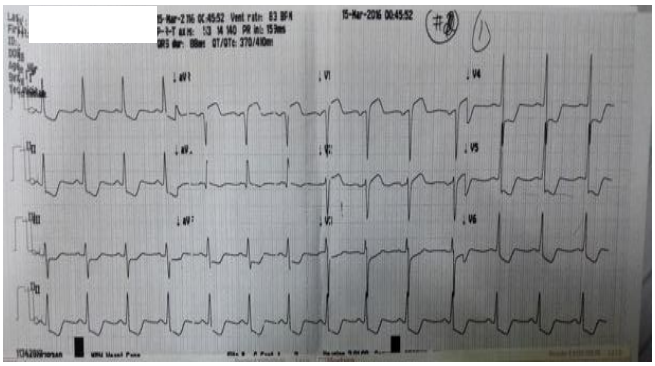

Fig. 1(a): ST-segment elevation in aVR, diffuse ST depressions in II, III, aVF, V4, V5 and V6

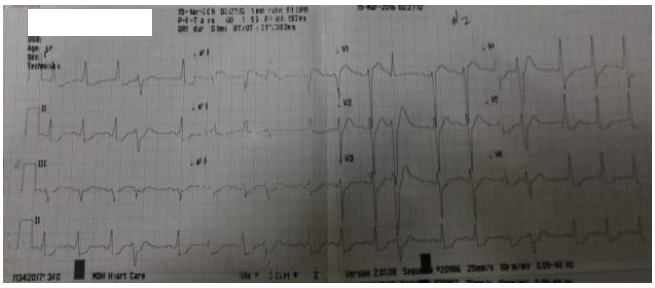

Fig. 1(b): ECG prior to arrest showing sinus arrhythmia with occasional premature ventricular contractions and diffuse ST-segment depressions

CASE 2

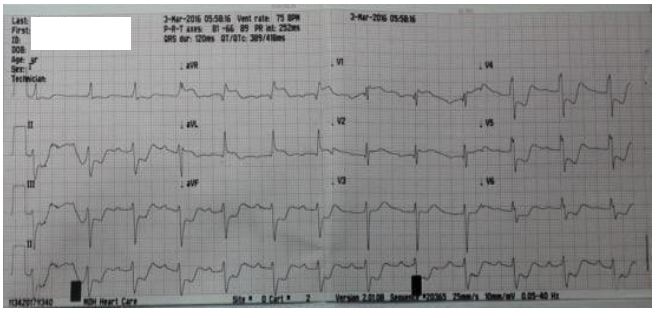

Fig. 2: ST-segment elevation in aVR and diffuse ST-segment depressions in leads I, II, III, aVF, V4, V5, and V6

A 58 year-old male came to the Emergency Department for chest heaviness with onset noted at three hours and forty-five minutes prior to consultation. He described the chest pain as crushing, and was associated with dyspnea. The patient was a known hypertensive, diabetic, with coronary artery disease. The patient was noted to be hypotensive at 80/60 mmHg. Initial 12-lead ECG in Fig. 2 showed ST-segment elevation in aVR and diffuse ST-segment depressions in leads I, II, III, aVF, V4, V5, and V6. Oxygen supplementation was started via nasal cannula, Morphine 4 mg IV, ASA 80 mg/tab, 4 tabs per orem, Ticagrelor 90 mg/tab, 2 tabs per orem, Atorvastatin 80 mg/tab per orem, and Pantoprazole 40 mg IV were given. Diagnostic exams were done. Troponin I was significantly elevated with value of 0.172, which was five times greater than the upper normal limit. The patient was then referred to Cardiology service for further management. At this point, Dopamine and Norepinephrine drips were also started still due to persistent hypotension. On the 1st hour of stay at the ED, the patient's ECG rhythm showed sinus rhythm with occasional premature ventricular contractions, still with lead aVR elevation. On the 2nd hour of ED stay, patient's cardiac rhythm showed pulseless electrical activity. ACLS was done for 39 minutes without success. After 3 hours and 36 minutes at the ED, the patient was pronounced dead.

CASE 3

A 75 year-old female patient was rushed to our Emergency Department due to dyspnea, which bothered the patient during the night causing her inability to sleep. This was associated with nausea, vomiting and a vague chest and upper back pain. The patient was diabetic, but was non-hypertensive. On initial physical examination, the patient was pale, with a palpatory blood pressure and bradycardic at 54 beats/minute. Initial 12-lead ECG on Fig. 3(a) showed sinus bradycardia with an isolated ST-segment elevation at aVR and diffuse ST depressions at leads II, aVF, V3 and V4. The patient was immediately venoclyzed with plain saline 600 cc fast drip for 2 cycles, then regulated to run at 80 cc/hour. Oxygen supplementation via nasal cannula was also started. Due to persistent palpatory BP, Dopamine drip was also started. Medications were given: ASA 80 mg/tab, 4 tabs per orem, Ticagrelor 90 mg/tab, 2 tabs per orem, and Pantoprazole 40 mg IV. Indwelling foley catheter was inserted and hooked to urine bag with good output. BP was repeated on the 40th minute of ED stay and was noted to be 60/30 mmHg; hence another IV line was started with plain saline to fast drip 1 liter. At this time, Norepinephrine drip was also started. The patient was then intubated due to decreased sensorium. At the same time, heart rate was noted to be at 38 beats/min; hence atropine was given through IV. Cardiology service was informed. Medical management was continued by the said service with addition of Dobutamine drip.

A second ECG shown on Fig. 3(b) was taken, which showed aVR ST-segment elevation, with complete right bundle branch block, and now with more pronounced ST-segment depressions in II, III, aVF, V3, V4, V5 and V6. On the 68th minute of ED stay, the patient was in pulseless electrical activity. ACLS was done for 10 minutes and the patient was revived to accelerated idioventricular rhythm. After another 41 minutes on inotropes, the patient again went into pulseless electrical activity and then asystole. Relatives opted to sign DNR. The patient was pronounced dead

after 2 hours and 14 minutes stay at the ED. No laboratory exams were facilitated due to the emergent nature of the management for this patient.

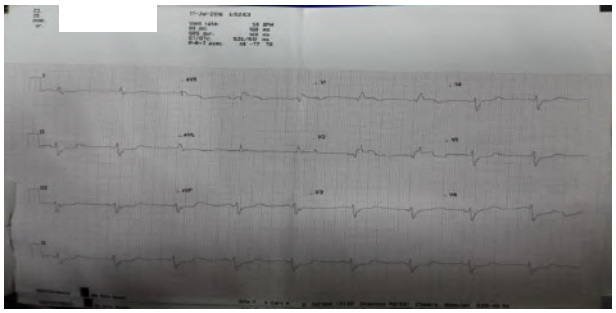

Fig. 3(a): Isolated ST segment elevation at aVR,

Diffuse ST depressions at II, aVF, V3 and V4

Fig. 3(b): aVR ST segment elevations, complete

right bundle branch block, ST depressions in II, III, aVF, V3,

V4, V5 and V6

CASE DISCUSSION

In patients presenting with angina symptoms, Acute Coronary Syndrome is one of the emergency physician's main differential diagnosis. The 12-lead ECG is one, if not the fastest diagnostic modality that may be used to support such diagnosis.

STEMI, as defined universally by ACCF/AHA in 2013, "is a clinical syndrome defined by characteristic symptoms of myocardial ischemia in association with persistent ECG ST elevation and subsequent release of biomarkers of myocardial necrosis." It was also stated that the preferred biomarker to be measured in myocardial infarction is the cardiac troponin.[9]

With the three cases, all presented with ischemic symptoms and were all subsequently signed out as cases of cardiogenic shock secondary to acute coronary syndrome. All were not brought to the Cardiac Catheterization Laboratory; hence, there were no specific anatomic occlusions or infarctions described and identified prior to the demise of the patients. Cardiac markers were also not done in two of the three patients due to their fast deterioration. However, for the one patient described in Case 2, the Cardiac Troponin I level value was 0.172, five times elevated than the higher range of normal value, which satisfies the criteria previously described.

CASE DISCUSSION

Lead aVR ST-segment Elevation

Formerly, lead aVR has been ignored due to the fact that its position is 180 degrees opposite from an imaginary lead between limb leads I and II; hence, it would not provide a specific data. Nowadays, it has been said that ST-segment elevation in aVR is a separate entity from ST-segment depression in the aforementioned opposing leads and is not related to non-STEMI; however, this seems to be related in cases of STEMI.[10]

In general, ischemic ST-elevation in aVR fits into two broad categories: first, patients with recognized STEMI due to coronary occlusion of the LAD, and second, patients without ischemic ST-elevation, but with diffuse ST-depressions, indicating sub-endocardial ischemia.[7]

Lead aVR in STEMI has been previously said to be an important ECG finding for recognizing LMCA occlusion. In previous studies by Zoghbi et al. (2010) and Kurisu et al. (2004), statistics showed that only 0.19-1.3% of STEMI patients have LMCA occlusion, or 0.42-3% of anterior STEMI, which may be explained by the fact that patients with occlusion (or obstruction) in the aforementioned coronary artery do not frequently survive to make it to the cardiac cath lab.[10,11,12] This was the same for the cases presented earlier.

The mortality in this group of patients is at 50%, and over 70% present to the physician already in cardiogenic shock. Hence, the patient's clinical presentation rather than the ECG nor results of cardiac biomarkers drive the diagnosis of severe ACS and the immediate need for emergent cardiac cath lab activation[10]

Other studies also found that ST-elevation in lead aVR has been an indicator of poorer prognosis and increased mortality in STEMI.[8] More follow-up studies were recommended in prognosticating this group of patients.

Diagnosis of aVR STEMI

The predictive value of ST-segment elevation in lead aVR was described in many studies and case reports. To be more specific, in the context of global ST-segment depression with anginal symptoms, the following may serve as a guideline:[1]

1. ST-elevation in aVR ≥ 1mm indicates proximal LAD/LMCA occlusion or severe 3-vessel disease
2. ST-elevation in aVR ≥ 1mm predicts the need for Coronary Artery Bypass Grafting
3. ST-elevation in aVR ≥ V1 differentiates LMCA from proximal LAD occlusion
4. Absence of ST-elevation in aVR almost entirely excludes a significant LMCA occlusion

In addition to the above criteria, ST depression in ≥ 2 precordial leads (V_1–V_4) may indicate a transmural posterior wall injury; and multiple lead ST-segment depression with coexistent ST-segment elevation in lead aVR has been described in patients found to have left main or proximal left anterior descending artery occlusion.[10]

Hence, diffuse ST-segment depression has a good positive predictive value and negative predictive value for three-vessel and left main disease, as mentioned in a literature review by Smith (2013).[10]

Significant ST-elevation was also studied in patients during Treadmill Testing (TMT). The study revealed that ST-elevation during TMT is an important indicator of significant left main coronary artery or ostial LAD stenosis, and that it may have the same value of localizing occlusions or infarctions during an attack of Acute Coronary Syndrome.[5]

Management of aVR STEMI

ST-segment elevation in lead aVR with diffuse ST-segment depressions indicating left main or left anterior descending artery insufficiency is already established as an indication for thrombolytic therapy as reported in the 2013 ACCF/AHA Guidelines. This was the first time that the aforementioned body recognized that the studies prohibiting thrombolytics for ST-depression did not include this high-risk group in previous guidelines.[6,9]

Significance of Timely Management

Treatment with fibrinolytics and primary percutaneous cardiac interventions were described as among the most important determinants of prognosis and the short-term and long-term outcomes in STEMI.[8]

The cited studies, case reports and reviews of literature show that lead aVR is highly significant. Lead aVR ST-elevation in the setting of Acute Coronary Syndrome must be promptly recognized by physicians, especially in the Emergency Department as a critical condition that leads to a high mortality rate. In evaluating and managing patients presenting with this ECG finding, physicians now have the chance to intervene and initiate immediate thrombolytic therapy if indicated and if without contraindications, and if available, emergent cardiac catheterization laboratory activation.

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CASE REPORT

What Lies Beneath: An Unusual Case of Aortic Dissection Presenting as an Acute Ischemic Stroke

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ABSTRACT

Introduction: Aortic dissection is a life-threatening emergency that commonly occurs due to a tear or injury on the inner wall of the artery. This disease may have a wide range of symptoms but typically causes severe pain on the chest, abdomen or back. This is usually accompanied by physical examination findings of hemodynamic instability. However, aortic dissection can also cause neurologic symptoms that are usually due to decreased cerebral perfusion.

Objective: Aortic dissection masquerading as an ischemic stroke is a diagnostic and therapeutic dilemma. In this age of thrombolytic therapy, misdiagnosis of an underlying aortic dissection in a patient presenting as a case of an ischemic stroke could be catastrophic and fatal.

Case Presentation and Discussion: We now report a case of a 70-year-old female presenting with focal neurologic deficits with an underlying aortic dissection as the culprit. The case was pursued from the initial presentation at the emergency room, to the diagnosis of aortic dissection, then to the repair of the dissection and the post-operative course. The timely diagnosis and recognition of aortic dissection as the underlying cause of the presenting neurologic symptom prevented mismanagement. ***Conclusion:*** This case report highlights the importance of recognizing atypical presentations of acute aortic dissection. Emergency physicians should always be vigilant and inquisitive in knowing alternate reasons in patients presenting with stroke symptoms to avoid misdiagnosis and mismanagement.

INTRODUCTION

Acute aortic dissection is a life-threatening emergency. Its incidence ranges from 5 to 30 cases per million per year[1]. Men are most commonly affected by this disease. A male/female ratio ranging from 2:1 to 5:1 has been reported[1]. The peak age of incidence of proximal dissection is between 50 and 55 years, and of distal dissection is between 60 and 70 years[1]. Chronic hypertension is the most frequent risk factor for developing aortic dissection. Other risk factors include aortic diseases, chromosomal aberrations and hereditary connective tissue diseases.

Aortic dissection usually arises from the rupture of the inner wall along the aorta with ensuing flap formation and progression of the dissection into the media. This is the initial event in most cases of dissection and the presence of an intimal flap is the typical characteristic feature of aortic dissection.[1]

There are two systems to classify aortic dissection. First is the Stanford Classification. Stanford Type A is described as a dissection involving the ascending aorta. Stanford Type B is defined as dissections confined solely to the descending aorta. The second classification is De Bakey Classification. De Bakey Type 1 involves the ascending aorta, arch and the descending aorta. De Bakey type 2 involves only the ascending aorta, and type 3 involves only the descending aorta. [2, 3]

Aortic dissection can produce varied symptoms but typically presents with a sudden onset of severe, ripping, tearing chest, back or abdominal pain with associated hemodynamic compromise. Symptoms usually occur subsequent to an intimal tear within the aorta forming a false and true lumen. Blockage of the carotid, vertebral, or spinal arteries, and a decrease

cerebral blood supply may happen and can cause neurologic symptoms[4,5].

Neurologic symptoms may mask the underlying condition and have been associated with 18% to 30% cases of aortic dissection and the usual culprit is cerebral ischemia and has been conveyed to involve 5% to 10% of patients[4,5].

In this age of thrombolytic therapy, misdiagnosis of an underlying aortic dissection in a patient presenting as a case of an ischemic stroke could be disastrous as a result of narrow diagnostic time window and severe hemorrhagic potential[6].

For this case report, several comparable cases were also reviewed. References, articles and case reports were identified by consulting well- established international textbooks and searches of PubMed with the terms 'aortic dissection', and 'ischemic stroke'.

This current study now presents a case of a 70-year-old, female, Filipino, without history of hypertension, coming in at the emergency department with complaints of epigastric pain and right sided hemiplegia who later on was found out to have an underlying aortic dissection.

OBJECTIVES

1.) To evaluate a case of an aortic dissection presenting with neurologic symptoms
2.) To weigh the importance of recognizing atypical symptoms of acute aortic dissection
3.) To value the significance of timely diagnosis in preventing mismanagement of patients with atypical symptoms of aortic dissections

CASE PRESENTATION

A 70-year-old, female, Filipino, non-hypertensive, non-diabetic, known to have Colon Cancer Stage II s/p Colon Surgery and Chemotherapy 2011, came in at the ER due to epigastric pain. History started 30 minutes prior to consult at the emergency room, after eating a slice of watermelon, when she suddenly had an onset of severe epigastric pain associated with chest pain and 3 episodes of vomiting. She also claimed to have difficulty of breathing. This was then followed by abrupt onset of right leg numbness and weakness, prompting ER consult. Patient denied having any urinary or bowel symptoms, fever, headache, dizziness and slurred speech.

She is a non-smoker and a non-drinker of alcoholic beverage. She has a family history of lung cancer and breast cancer.

Upon arrival at the ER, patient had the following vital signs: blood pressure 78/59 (MAP 65), heart rate 79, respiratory rate 17, afebrile, with 100% Oxygen saturation and a pain scale of 10/10. On physical examination, patient was seen conscious, coherent and follows command. She was diaphoretic and pale looking. She had clear breath sounds with a normal heart rate and rhythm on auscultation. No murmurs were appreciated. Abdominal examination showed a flabby, soft abdomen with direct tenderness on the epigastric area. On neurologic examination, patient was oriented to 3 spheres, had a GCS of 15; Cranial nerves were intact: motor strengths were as follows: 3/5 on right upper extremities, 3/5 on the right lower extremity, 5/5 on the left upper and lower extremities; sensory examination revealed 100% on both upper and lower extremities.

At this point in time, patient was under the clinical impression of having an Ischemic Stroke, to rule out an Acute Coronary Syndrome.

Patient was hooked to a cardiac monitor and pulse oximeter. She was placed on oxygen supplementation at 2L/min via nasal cannula. Venoclysis with PNSS was started on both extremities with an initial fast drip of 500ml was done. BP then went up to 90/60 mmHg on both upper extremities.

Initial laboratory tests revealed normal complete blood count, serum sodium, ionized calcium, magnesium, blood urea nitrogen, creatinine, prothrombin and partial thromboplastin time. Potassium was noted to be low at 2.9 mmol/L. Electrocardiography showed sinus rhythm with non-specific intraventricular conduction defect with ST-T wave changes suggestive of ischemia in leads II, III, aVF. Troponin T (Quantitative) was normal.

Simultaneously, a brain attack team also assessed the patient with the initial impression of an acute ischemic stroke. A plain cranial CT scan was requested however, was later deferred due to unstable conditions.

Due to the patient's hypotension, point of care ultrasound was done showing a positive FAST revealing pericardial effusion. Portable chest radiography later

on revealed a widened mediastinum with widening of the aortic contour.

At this time, the working diagnosis was an Aortic Aneurysm with Dissection and an Ischemic stroke. Thus, a formal bedside 2-Dimensional Echocardiography was done which revealed a dilated aortic root at the level of the proximal ascending aorta with 2 linear echogenic densities consistent with an intimal flap. A CT Aortogram was then requested which revealed a fusiform aneurysm of the ascending aorta with evidence of dissection (Stanford Type A, De Bakey Type I) involving the entire thoracic and abdominal aorta from the aortic root extending down to the left common iliac artery.

The patient then underwent immediate operation. A repair of acute aortic dissection Stanford Type A under hypothermic circulatory arrest and retrograde cerebral perfusion was done. The patient also had a transesophageal echocardiography done intraoperatively which revealed a dilated proximal ascending aorta measuring 4.7cm with 2 undulating redundant linear echogenic densities in the aortic lumen originating from the anterior and posterior sinotubular junction traversing the proximal ascending aorta, arch and visualized descending thoracic aorta consistent with an intimal flap of an aortic dissection. Intraoperative findings later on showed a dilated ascending aorta with a 3cm tear. Cardiac tamponade was also noted which caused the patient to have cardiac arrest. She was revived immediately. Surgical treatment followed with the patient tolerating the procedure well.

Post-operatively, the patient had seizure episodes and assessed to have hypoxic ischemic encephalopathy versus a seizure probably secondary to an acute stroke. She then had another plain cranial CT Scan at this time which showed bilateral acute to subacute cerebellar infarction with probable punctate hemorrhages in the right cerebellum with associated mass effect to the midbrain and pons.

The postoperative course of the patient became complicated and the patient's relatives opted for a do not resuscitate status. The patient eventually expired.

CASE DISCUSSION

Aortic dissection is diagnosed, for the most part, using complete history and physical examination and confirmed by radiologic (CT Scan/Echocardiogram) examination. Timely diagnosis is key to prevent misdiagnosis and mismanagement because mortality from this disease ranges from 1% to 2% per hour during the first 24 to 48 hours[7].

This disease more frequently affects males than females and is usually common in patients on the sixth and seventh decades of life[8]. Its incidence is from 5 to 30 cases per million per year[9]. Moreover, it has been shown that long standing hypertension is the most common predisposing factor and is seen in 62 to 78% of patients with aortic dissection[9].

In this case, the only predisposing factor seen in the patient is her age. She has neither history of chronic hypertension, trauma to the chest nor any previous chest surgeries. However, due to the patient's age, she is predisposed to develop an atherosclerotic disease which can affect the aorta and cause an aortic aneurysm which later on led to the patient's dissection.

There are two systems to classify aortic dissection. First is the Stanford Classification. Stanford Type A is described as a dissection involving the ascending aorta. Stanford Type B is defined as dissections confined solely to the descending aorta. The second classification is De Bakey Classification. De Bakey Type 1 involves the ascending aorta, arch and the descending aorta. De Bakey type 2 involves only the ascending aorta, and type 3 involves only the descending aorta. [10,11]

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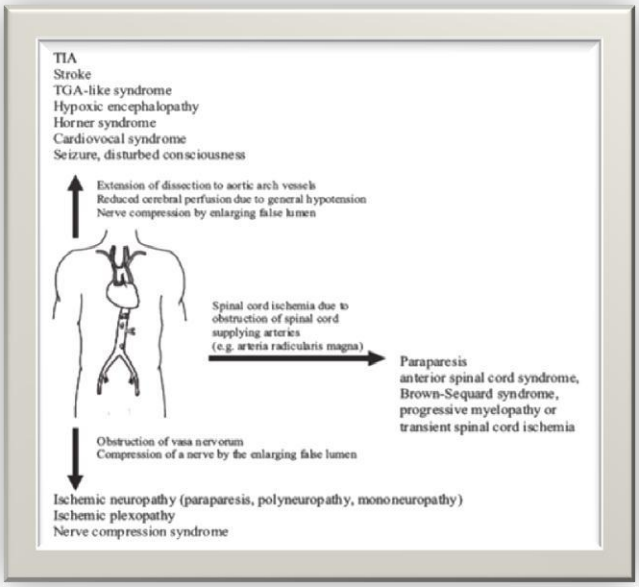

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the present case, a fusiform aneurysm of the ascending aorta with evidence of dissection (Stanford Type A, De Bakey Type I) involving the entire thoracic and abdominal aorta from the aortic root extending down to the left common iliac artery was established using CT Scan.

Aortic dissection can manifest with varied symptoms. In this case, the patient presented with epigastric pain associated with chest pain and right sided hemiplegia. In a case series done by the International Registry of Acute Aortic Dissection (IRAD), they found out that severe pain was the most common presenting symptom, and 84.8% of patients had abrupt onset of symptoms[12]. The frequent site of pain was the chest (73%), followed by back pain (53%) and abdominal pain (30%)[13]. However, chest, back or abdominal pain is not a necessary indicator of aortic dissection[14]. It is important to note that aortic dissection can also present with atypical symptoms. Painless aortic dissections can happen but are uncommon and frequently misdiagnosed[14]. Neurologic deficits are also seen in patients with aortic dissection and have been associated with 18% to 30% of cases[14, 15].

Acute stroke symptoms may develop when the aortic dissection extends to the innominate artery, common carotid arteries or/and left subclavian artery[16]. But none of this arteries were involved in this patient. The presenting symptom of right sided hemiplegia may be attributed to decrease cerebral perfusion secondary to the hypotension of the patient.[16] In addition, in a similar case report of a patient presenting with left monoparesis by Takahashi et. Al., they considered that global cerebral ischemia may have also caused the neurologic deficit of the patient. Moreover, the patient in that case report also presented with Type A dissection, as what was seen also in our patient. Furthermore, it has been shown that Type A dissections usually manifest with low blood pressure in 60% of cases therefore leading to decrease cerebral blood flow.[17]

The figure shows the central and peripheral manifestations and pathophysiology of neurologic symptoms in patients with aortic dissection.[18]

Usually, once a patient is diagnosed as having ischemic stroke, thrombolytic, antiplatelet or anticoagulant therapy may be started before the true cause of the stroke is determined[19]. If ischemic stroke develops with an underlying aortic dissection as the cause, thrombolytic treatment would be fatal. It can cause life-threatening clinical events, such as cardiac tamponade or hemothorax[20]. In this case, the patient presented with a time window of less than an hour from the onset of right sided hemiplegia. This makes her a good candidate for thrombolytic therapy. However, due to the cause of the patient's presentation of hypotension, a possibility of an aortic dissection was entertained. Bedside ultrasonography was done and showed pericardial effusion and gave an extra clue or suspicion that they are not only dealing with an ischemic stroke. Further diagnostics such as the chest radiography which showed mediastinal widening supplemented the possibility of an aortic dissection. In addition, computed tomography, a 2D Echocardiography and a transesophageal echo (TEE) were done and promptly confirmed the diagnosis.

Since aortic dissection is a life-threatening emergency, immediate imaging techniques must be done to confirm and know the extent of the injury. Hence, the choice of imaging modality depends chiefly on the availability and rapidity of the test. The imaging modalities that are useful for the diagnosis and have been reported to have high sensitivity, specificity, diagnostic accuracy, and positive and negative predictive values are Computed Tomography Scanning, MRI, Trans-esophageal echocardiography and angiography[21].

Chest radiography usually lacks specificity for diagnosing aortic dissection. Nonetheless, it is a valuable initial diagnostic imaging of choice in combination with the clinical findings (history and physical examination) of the patient. The classic sign in a chest radiograph evocative of an aortic dissection is a widened mediastinum. This finding has been reported in up to 50% of cases of aortic dissection[21]. This was also seen in the case of our patient and helped strengthen the impression of an aortic dissection.

CT Scanning, which is the usual imaging modality performed due to its rapid diagnostic capability, was also performed in our patient and confirmed the diagnosis. CT scan has been reported to have a sensitivity of 83 to 94% and a specificity of 87 to 100%. The main disadvantages of the use of CT Scanning in aortic dissection, is difficulty in detecting the origin of the intimal tear, assessing the involvement of aortic branch vessels, and inability to give information about aortic valve regurgitation.[21]

Transesophageal echocardiography has a sensitivity of 98% and a specificity of 63 to 96%. It also allows the identification of the entry site of dissection; presence of thrombus; abnormal flow characteristics; involvement of coronary and arch vessels; presence, extent and hemodynamic significance of pericardial effusion; and the presence and severity of aortic valve regurgitation. But the most important finding of aortic dissection using TEE, which was also seen in our patient, is the presence of an undulating intimal flap within the aortic lumen that differentiates a false from a true lumen.[21]

In this case report, urgent surgical repair was done. This is usually the required management for patients presenting with Type A Aortic Dissections. However, studies have exhibited that immediate surgical management of Type A dissections associated with stroke symptoms were associated with worsening of an ischemic infarction[22]. This happened in the present case. Remember that the cranial CT scan was only done after the surgical intervention and showed bilateral acute to subacute cerebellar infarction with probable punctate hemorrhages in the right cerebellum with associated mass effect to the midbrain and pons. According to some studies, there is a risk of hemorrhagic conversion and worsening of an ischemic infarction after reperfusion following cardiopulmonary bypass and anticoagulation. This led to the suggestion by some studies that delayed surgical intervention until cerebral injury stabilizes may be done[22]. However, in a study done by Bossone et. Al., which also evaluated other similar studies regarding stroke and outcomes in patients with type a dissection, they established that early surgical intervention of type A aortic dissection patients manifesting with stroke is safe and is associated with lower short and long-term mortality. Nevertheless, they recommend that additional studies should be instituted to determine the most favourable timing (early vs late) of surgery and to compare outcomes between surgical strategies.[22]

CONCLUSION

This case report highlights the importance of recognizing atypical presentations of acute aortic dissection. This case report also highlights the idea that patients presenting with acute stroke symptoms associated with decreased blood pressure should also include aortic dissection in the differential diagnosis. Moreover, this study stresses the importance of prompt diagnosis of an acute aortic dissection with the help of a complete history, physical examination and the use of imaging studies. Lastly, emergency physicians should always be vigilant and inquisitive in knowing alternate reasons in patients presenting with stroke symptoms to avoid misdiagnosis and mismanagement.

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INTERESTING CASE PROTOCOL

Endoscopic extraction of methamphetamine packet causing esophageal obstruction

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Abstract

Esophageal obstruction among body stuffers, who haphazardly ingest drug packets to evade police arrest, remain to be rarely reported. Limited studies have been published on its occurrence while conflicting recommendations have been cited on the role of endoscopy as the definitive management. This case report aims to present esophageal obstruction as a rare consequence of body stuffing among prohibited drug users and to recognize the role of endoscopy in its successful management. A case of a 36-year old man, who came in the emergency department due to chest pain after ingesting a methamphetamine packet sealed in a plastic sachet and wrapped with a plumber's tape resulting to complete esophageal obstruction, is presented in this report. No clinical toxicity was observed. Esophagoscopy with foreign body extraction was done. An intact 3.0 x 3.0 x 3.0-cm spherical dark brown packet containing 300 mg of methamphetamine was successfully extracted without complications.

Keywords: esophageal obstruction, body stuffing, methamphetamine, endoscopy

Body stuffing is the haphazard ingestion of prohibited drugs to evade law enforcement (Aks & Bryant, 2015; Marx et al., 2014). Body packing, on the other hand, is an organized concealment of prohibited drugs, most commonly by ingestion, in an intent to cross international borders (Aks & Bryant, 2015; Marx et al., 2014; Tintinalli et al., 2016). Drug packets are systematically and carefully packed in body packing. Drug packets among body stuffers and body packers are commonly impacted in the lower gastrointestinal tract. Esophageal obstruction, on the other hand, is a rare complication with a prevalence of 0.7% based on a five-year single-center retrospective study published by a Dutch working group (de Bakker et al., 2012).

A systematic search of published articles on esophageal obstruction from body stuffing or packing was done using the PubMed (US National Library of Medicine - National Institute of Health) database last accessed on 18 August 2016.

Five relevant case reports were identified dating back from 1991 to 2015. All studies were published in the English language. The search terms "foreign body AND esophagus AND body packer" yielded four case re-ports. Esophageal obstruction from body packing was cited in two studies (Hantson, Capron, & Maillard, 2014; Karkos, Cain, & White, 2005). Due to the limited results, a broader search strategy was done. Using more inclusive search terms "foreign body AND esophageal obstruction", three other relevant case reports were identified (Cowan, Gibson, & Berling, 2015; Macedo & Ribeiro, 2001; Johnson & Landreneau, 1991). Only five case reports and one retrospective study in nearly 25 years had documented the occurrence of esophageal obstruction among body stuffers and body packers supporting its infrequent occurrence.

The diagnosis of drug packet impaction among body stuffers is primarily based on history and physical examination (Aks & Bryant, 2015; Marx et al., 2014). At present time, gastrointestinal obstruction from impacted drug packets occurs more frequently than drug toxicity because of well-planned and vastly improved packing. The emergency physician should maintain a high index of suspicion among prohibited drug users especially those who present with atypical obstructive complaints like chest tightness (Aks & Bryant, 2015; Marx et al., 2014; Tintinalli et al., 2016). Imaging modalities such as plain radiographs and computed tomography are not routinely recommended particularly in cases when the history of ingestion is straightforward. On the treatment aspect, endoscopic removal of impacted drug packets in the upper gastrointestinal tract has been controversial, ill-advised, and rarely re-ported with success because of the risk of packet perforation which may result to lethal toxicity (Cowan, Gibson, & Berling, 2015; Marx et al, 2014; Shabani, Zamani, & Has-sanian-Moghaddam, 2016).

The objective of this case report is to present esophageal obstruction as a rare presentation of body stuffing and to recognize the role of endoscopy as a non-invasive definitive treatment.

CASE REPORT

A 36-year old male, with no known co-morbidity, was admitted in the emergency department due to chest tightness. The patient was hypotensive at 80/50 mmHg, tachycardic at 125 beats per minute with dry skin and oral mucosa. Respiration was normal at 20 cycles per minute He was afebrile. Oxygen saturation was normal at 98% in room air. No adventitious lung sounds were appreciated. The patient was awake, alert, oriented to time, place, and person, and with comprehensible speech. Careful hydration was done for hypotension. The blood pressure subsequently improved to 100/60 mm Hg after two liters (30 mL/kg) of normal saline administered intravenously.

On history taking, the patient started to experience sudden dysphagia to solids and liquids, globus sensation with pooling of saliva associated with the chest tightness. Probing further, the patient, who was a chronic meth-amphetamine user for 16 years, admitted to have swallowed a methamphetamine packet wrapped in a plastic sachet and then tightly sealed with a plumber's (Teflon^{TM}) tape in the fear of police arrest two weeks prior to admission.

Physical examination was unremarkable after hypotension and tachycardia were resolved with careful intravenous hydration. On reassessment, the patient was alert, awake, and oriented to time, place, and person. He was comfortable and cooperative. Pupils were 3 mm equal-ly & briskly reactive to light, breath sounds were clear, abdomen was flat, normoactive, soft & non-tender. Rectal vault was empty on digital rectal examination. Neurologic examination was essentially normal. No signs and symptoms of methamphetamine toxicity were noted.

Urine screening for methamphetamine was positive. Complete blood count was within normal. Serum electrolytes showed hypernatremia (169 mmol/L). The 12-lead electrocardiogram showed sinus tachycardia, normal axis, non-specific ST-T wave changes. Troponin I was negative. Cervical STAPL, chest PAL showed unremarkable results. Attempts on nasogastric tube insertion were done for the initiation of multiple-dose activated charcoal (MDAC) therapy; however, attempts were unsuccessful due to persistent resistance. Dark and fleshy outputs were noted per nasogastric tube.

Due to inability to insert the nasogastric tube, esophagoscopy was done. A spherical foreign body was visualized 18 cm from central incisors. The esophageal mucosa was edematous and macerated at six o'clock position 18 to 20 cm from central incisors. An intact 3.0 x 3.0 x 3.0 cm spherical dark brown packet containing 300 mg of methamphetamine was successfully extracted. There was minimal bleeding. No laceration nor perforation was noted. Nasogastric tube was inserted. Procedure was tolerated well. The course of admission was unremarkable. The patient was handed over to police custody after ten hospital days while the methamphetamine packet was surrendered to the University of the Philippines-Philippine General Hospital police.

DISCUSSION

The internal concealment of prohibited drugs, as described, utilized in smuggling was first described in 1975 (De Bakker et al., 2012). The Philippine Dangerous Drugs Board cited that the most common prohibited drug abused in the country is methamphetamine hydrochloride popularly known as shabu or bato. Currently, no local data exists on the epidemiology and extent of body stuffing and packing.

Esophageal obstruction among body stuffers is rare. Most drug packets are impacted in the lower gastrointestinal tract. Impaction of drug packets in the esophagus has only been reported in five case reports (Cowan, Gibson, & Berling, 2015; Hantson, Capron, & Maillart, 2014; John-son & Landreneau, 1991; Karkos, Cain, & White, 2014; Macedo & Ribiero, 2001) and in one

Figure 1. A 3x3x3 cm spherical foreign body containing 300 mg of methamphetamine was successfully extracted through esophagoscopy

retrospective study (De Bakker et al., 2012). The aforementioned case reports described the successful endoscopic removal of drug pack-ets lodged in the esophagus. Furthermore, a single case of esophageal obstruction of a drug packet successfully re-moved through thoracotomy was detailed by de Bakker and co-workers in 2012.

Careful history taking and high index of suspicion are important in the diagnosis of body stuffing. The emergency physician should be able to identify risk factors to body stuffing especially among known drug users and to recognize specific drug toxicity, which will warrant emergent treatment. Plain radiographs, in cases of esophageal and intestinal impaction, have been initially utilized in an attempt to determine complications like intestinal obstruction. However, plain radiographs are generally not diagnostic in localizing the impacted packets. Computed tomogra-phy has been the imaging modality of choice for localizing drug packets. Routine use of radiographic imaging is not currently recommended specially in circumstances where history of ingestion and clinical presentation are unambiguous (Aks & Bryant, 2015). Computed tomography was not done in this patient since the patient's history of intentional ingestion is straight forward.

Body stuffers and packers are less susceptible to packet rupture due to better packing techniques. Materials used like rubber and other sealed wrappers have been utilized for better concealment. Because of this, body stuffers and packers present more commonly with obstructive symptoms rather than toxicity (Wong, Lai, & Chung, 2016). The methamphetamine, cited in this case, was contained in a double-layered plastic-Teflon™ packet.

Currently, there is no clear consensus on the best method to remove drug packets in the gastrointestinal tract. Surgical approach on removing drug packets is widely utilized as series of cases have proven its efficacy and safe-ty in terms of successfully removing the drug packet and avoiding packet rupture particularly among patients who show clinical signs of toxicity necessitating immediate removal of drug packets. At present time, surgical removal of impacted drug packets is only compared to conservative management through the administration of polyethylene glycol solution that may speed distal movement (Marx et al., 2014).

Rarely reported and infrequently described is the endoscopic removal of drug packets. It is considered controversial and ill-advised because the risk of packet perforation during the procedure outweighs the benefits (Beauverd

et al., 2011; Marx et al., 2014; Wong, Lai, & Chung, 2005). Packet perforation may result to the release of hazardous amounts of the drug leading to lethal toxicity and mortality. Despite being highly controversial, few studies have report-ed its success on removing drug packets in the upper gas-trointestinal tract (Choudhary, Taubin, Gupta, & Roberts, 1998; Macedo & Ribeiro, 2001; Karkos, Cain, & White, 2004). In a series of case reports, endoscopic removal has been reported with success among body stuffers who have multilayer, adequately-wrapped drug packets (Shabani, Zamani, & Hassain-Moghaddam, 2016). The characteristic double-layered drug packet in this case considerably al-lowed endoscopic removal to be attempted with success.

Presently, no adequately powered studies have been published comparing success and complication rates of endoscopic and surgical removal of drug packets. Successful endoscopic removal of impacted drug packets in the upper gastrointestinal tract, as presented in this case, should be described and documented to contribute on the currently limited data utilizing endoscopy in removal of drug packets. Through this, endoscopic protocol on removing drug pack-ets in the upper gastrointestinal tract may be created and detailed for endoscopy be considered not just an option but as the procedure of choice for esophageal obstruction.

CONCLUSION

Thus, a case of esophageal obstruction from a methamphetamine packet and its successful removal using an endoscopic technique is reported. This case report may contribute to the limited source of knowledge on the successful endoscopic removal of drug packets that are rarely lodged in the esophagus.

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Compassion Fatigue Among Physicians and Nurses in the Emergency Department,

Makati Medical Center (2015)

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Abstract

Burn out, compassion fatigue, vicarious trauma and secondary traumatic stress describe a group of potential occupational hazards among those who work in caring roles. There has been no published study in the Philippines yet investigating compassion fatigue in both ED physicians and nurses. This study aims to measure the prevalence of compassion fatigue in physicians and nurses working in the Emergency Department. A survey (Professional Quality of Life (ProQOL) questionnaire) was distributed to emergency consultants, residents and nurses working in the Emergency Department of Makati Medical Center during September – December 2015. Demographic and work factor data was collected. The prevalence of burn out in the ED (all respondents) was found to be 25.5% and secondary stress was found to be 19.61%. Fourteen respondents were identified for intervention. However, only 2 individuals consented to be referred to an intervention program. Demographics identified to be associated with compassion fatigue (burn out) were marital status (single) and having children. If an employee is single and if an employee has a child it is associated with lower compassion satisfaction. If the respondent is single it is associated with increased burn out. Job characteristics had no association with compassion fatigue.

Keywords: compassion fatigue, burn out, secondary stress

The practice of medicine in the Emergency Department (ED) is chaotic and chronically exposed to stress. Emergency department staff deal with patients at their worst: trauma cases, victims of violence, combative patients and patients in extremis. The consequence of experiencing emotional distress as a result of such patient contact can take a toll on health professionals.

Burn out, compassion fatigue, vicarious trauma and secondary traumatic stress describe a group of potential occupational hazards that are increasingly being recognized as such among those who work in caring roles[1]. Compassion fatigue in particular, was found to be an outcome of working with traumatized patients with emphasis placed on the level of exposure that professionals had to trauma and the capacity of professionals to empathise[2]. It is the state of exhaustion and dysfunction,

biologically, physiology and emotionally due to prolonged exposure to compassion stress[3]. According to Stamm[4], it is also characterized by the negative aspects of providing care to those who have experienced extreme or traumatic stressors. It is broken down into two negative aspects: burn out and secondary traumatic stress. Specific manifestations of compassion fatigue can be found in Table 1, under Definition of Terms. Although burnout is part of compassion fatigue and similar, they are separate concepts[5] (differences are highlighted in Table 2). Burnout originates from failure to achieve desired goals (e.g. work conflicts) versus compassion fatigue where it occurs when rescue-caretaking strategies are unsuccessful, leading to caregiver distress and guilt[5]. Compassion fatigue is measured by examining the levels of compassion satisfaction, burn out and secondary traumatic stress[4].

There have been a number of studies investigating the prevalence of burnout in ED medical staff (physicians and nurses)[7-11]. It has also been documented that burnout is highly prevalent in Emergency Medicine resident physicians[12]. However, it has been noted that very few articles have been found that have attempted to measure compassion fatigue in physicians[1]. Studies on compassion for emergency physicians in particular, have also been noted to be few[13]. In contrast, there have been several articles and studies published of compassion fatigue encountered by nurses[3,5,11,15-16]. There has been no published study in the Philippines yet investigating compassion fatigue in both ED physicians and nurses.

This study aims to measure the rate of compassion fatigue in physicians and nurses working in the Emergency Department, and to identify salient demographic and job characteristic factors associated with compassion fatigue.

Definition of Terms

1. Burn out - A prolonged response to chronic emotional and interpersonal stressors on the job, and is defined by the three dimensions of exhaustion, cynicism, and inefficacy[18.] Burnout undermines the care and professional attention given to clients of human service professionals such as teachers, police officers, lawyers, nurses, and others[19]. This arises from work conflicts and when assertiveness-goal achievements intentions are not met[5].

2. Compassion Fatigue - Diminished capacity of a health professional when experiencing the distress at knowing about or witnessing the suffering of their patients[1]. It is also defined as state of exhaustion and dysfunction, biologically, physiology and emotionally due to prolonged exposure to compassion stress [3]. Specific manifestations of compassion fatigue are listed in Table 1.

Compassion fatigue is made up of two components: burnout and secondary traumatic stress[4]. Although burnout is part of compassion fatigue and similar, they are separate concepts[5]: differences are highlighted in Table 2.

Table 1. Manifestations of Compassion Fatigue	
Emotional	• Anger/ Apathy • Breakdown/ Cynycism • Desensitization • Discouragement • Dreams, flashbacks, preoccupation (r/t patient experiences) • Feelings of being overwhelmed • Attitude of hopelessness • Irritability • Lessened enthusiasm • Sarcasm

Intellectual	• Boredom • Concentration impairment • Disorderliness • Weakened attention to detail
Physical	• Increased somatic complaints • Lack of energy • Loss of endurance • Loss of strength • Proneness to accidents • Weariness, sense of fatigue, exhaustion
Spiritual	• Decrease in discernment • Disinterest in introspection • Lack of spiritual awareness • Poor judgement r/t existential issues
Work	• Absenteeism • Avoidance of intense patient situations • Desire to quit • Diminished performance ability (i.e. medication errors, decreased documentation accuracy/record keeping) • Stereotypical/impersonal communications • Tardiness

Table Reproduced from Boyle, D. Countering Compassion Fatigue: A Requisite Nursing Agenda. 2011.OJIN.Vol16.No01Man02

Table 2. Characteristics Differentiating Burnout from Compassion Fatigue

Variable	Burnout	Compassion Fatigue
Etiology	Reactional: response to work or environmental stressors (i.e. staffing, workload, managerial decision making, inadequate supplies or resources)	Relational: consequences of caring for those who are suffering (i.e. inability to change course of painful scenario or trajectory)
Chronology	Gradual, over time	Sudden, acute onset
Outcomes	Decreased empathic responses, withdrawal; may leave position or transfer	Continued endurance or 'giving' results in imbalance of empathy and objectivity; may ultimately leave position

Table Reproduced from Boyle, D. Countering Compassion Fatigue: A Requisite Nursing Agenda. 2011.OJIN.Vol16.No01Man02

3. Compassion Satisfaction - The positive feelings about people's ability to help[4]
4. Vicarious trauma – The undesirable outcomes of working directly with traumatized populations and presents as negative transformative processes experiences by health professionals when exposed to traumatized patients[1].
5. Secondary Traumatic Stress – A stress response resulting from witnessing or knowing about the trauma experienced by significant others. It is the destructive emotional distress resultant of an encounter with a traumatized and suffering patient who has suffered primary or direct trauma[1].

Methodology

The study design is descriptive. A survey was distributed through convenience sampling to staff working in the Emergency Department of Makati Medical Center in 2015, specifically Emergency Medicine consultants (n=10), Emergency Medicine residents (n=36) and Emergency Department nurses (n=110).

Questionnaire

1. The Professional Quality of Life (ProQOL) questionnaire: a 30 item instrument using a 6 point Likert scale (0 = never, 5 = very often). The

instrument yields a composite score and 3 sub scale scores including compassion satisfaction, burnout and compassion fatigue[4,11]. The instrument has been documented to have good construct validity and has been used in numerous published papers[4]. It has been tested extensively and found to be reliable (α reliabilities on compassion satisfaction = .87, burnout = .72, and compassion fatigue = .80) and valid as a measure of the 3 separate concepts[11]. The Compassion Fatigue scale is distinct[4].

2. Demographics: Age group, sex, marital status, and number of children living at home (< 18 years old)
3. Job characteristics: Job assignment (Department Position, Rotations, Emergency Department Station), number of years working in the Emergency Department, shift hours.

The questionnaires were distributed when the participants are not actively on duty and from duty. The ProQOL were distributed to participants during the monthly Emergency Department Staff Meeting, monthly Emergency Department Resident's Meeting and Nurses Meeting from the months September – December 2015. Individuals who are from duty present at the meetings were instructed to submit the questionnaires the following day at the designated questionnaire drop off box. They were not allowed to fill up the questionnaires during the meeting.

Surveys were coded and participants were not required to give identifying information (i.e. Names) on the questionnaires. The forms were enclosed in coded sealable envelopes to ensure anonymity. After understanding and signing the Consent Form, individuals then answered the questionnaire. Consenting participants to referral were asked to provide their contact information (mobile number and email address) and enclose them in separate sealed envelopes. The envelopes will be opened and contact information used only in the event that the consenting participant has compassion fatigue and referral to an intervention program is needed.

After finishing the survey, the participants were instructed to enclose the questionnaire in its envelope, seal it, and drop it in a labeled box in the Emergency Department Faculty Room to ensure anonymity. A total of 107 questionnaires were distributed and 51 questionnaires were collected by the end of the collection period.

Results and Data Analysis

Demographic survey data was tabulated and analyzed descriptively. Raw ProQOL scores was converted to standardized scores and categorized to predefined ProQOL thresholds of : 'below average', 'average' and 'above average'[11,13]. Thresholds were then tabulated. The prevalence of compassion satisfaction, compassion fatigue and burn out were calculated with 95% confidence intervals. The α level was set at .05 for statistical significance.

Based on previous research[13], multivariate linear regression analysis was conducted to investigate associations between compassion satisfaction, compassion fatigue and burn out (outcome variables) and demographic and work factors (independent variables).

Table 1. Summary of T-Scores for Compassion Satisfaction, All Respondents (ED Staff)

Summary of T-Scores for Compassion Satisfaction		
All Respondents	Count	Percentage
T-score < 40	12	23.53
40<= T-score <=57	21	41.18
T-score > 57	18	35.29

From table 1, 35.29% of the respondents have compassion satisfaction score greater than 57. This represents the prevalence of the respondents who derive a good deal of professional satisfaction from their position (ProQOL Manual, 2010). On the other hand, 23.53% of the respondents may either find problems with their job, or there may be some other reason for not. being satisfied. These have compassion satisfaction score less than 40

Doctors (n = 29)	**Compassion Satisfaction**	**Percent**	**Nurses (n = 22)**	**Compassion Satisfaction**	**Percent**
Below 40	7	24.14 %	Below 40	5	17.24 %
40<=x<=57	14	48.28 %	40<=x<=57	7	24.14 %
Above 57	8	27.59 %	Above 57	10	34.48 %

(ProQOL Manual, 2010).

Table 2. Summary of T-Scores for Compassion Satisfaction, Doctors vs. Nurses

Compassion satisfaction among was found to be above average in 27.59% of doctor respondents and 34.48% in nurses. Decreased compassion satisfaction was found to be the least prevalent in both doctors and nurses, which is 24.14% and 17.24% respectively, which reflects the prevalence in Table 1 (scores of all respondents).

Table 3. Summary of T- Scores for Burn Out, All Respondents (ED Staff)

Summary of T- Scores for Burn Out		
All Respondents	Count	Percentage
T-score < 18	0	0
18 <= T-score <= 57	38	74.5
T-score > 57	13	25.5

Table 3 shows the summary of burn out scores. 29.41% of the respondents reflects positive feelings about their ability to be effective in their work as reflected by their low burn out score (ProQOL Manual, 2010). 13 (25.5%) among the 51 respondents have burn out scores higher than 57, this translates to not being effective in their position (ProQOL Manual, 2010)

Table 4. Summary of T- Scores for Burn Out, Doctors vs. Nurses

Doctors (n = 29)	**Burn Out**	**%**	**Nurses**	**Burn Out**	**%**
Below 18	5	17.24%	Below 18	2	6.90%
18<=x<=57	16	55.17%	18<=x<=57	15	51.72%
Above 57	8	27.59%	Above 57	5	17.24%

Burn out was found in 27.59% of doctor respondents and 17.24% in nurses, which is the second most prevalent category.

Table 5. Summary of T- Scores for Secondary Traumatic Stress, All Respondents (ED Staff)

Summary of T- Scores for Secondary Traumatic Stress		
	Count	Percentage
T-score < 43	11	21.57
43<= T-score <=57	30	58.82
T-score > 57	10	19.61

From table 5, 19.61% of the respondents scored higher than 57. This is the prevalence of those that should consider which things at work may be frightening to or if there is some other reason for the elevated score.

Table 6. Summary of T- Scores for Secondary Traumatic Stress, Doctors vs. Nurses

Doctors	Secondary Traumatic Stress	%	Nurses	Secondary Traumatic Stress	%
Below 43	4	13.79 %	Below 43	3	10.34 %
43<=x<= 57	19	65.52 %	43<=x<= 57	15	51.72 %
Above 57	6	20.69 %	Above 57	4	13.79 %

Secondary traumatic stress was found in 20.69% of doctor respondents and 13.79% in nurses, which is the second most prevalent category. However in the pooled summary of scores, respondents with scores above 57 were the least prevalent (table 5).

Association of Demographic Variables and Job Characteristics to Compassion Fatigue

Compassion Satisfaction

Full Model

t- score for Compassion Satisfaction = Gender + Age + Marital Status + Children + No of children at home + Occupation + Job Years + Years in MMC ER + ER Station Main

Assumption Checking

A. OUTLIERS

To check the presence of outliers which are observations with extreme values, Bonferonni outlier test was administered. A Bonferonni p value of the largest studentized residual which is less than 0.05 indicates an outlier. In this case, there is no studentized residual with Bonferonni p < 0.05. Therefore, no outlier is present.

Table 7. Bonferonni Outlier Test for Compassion Satisfaction

```
Largest |rstudent|:
    rstudent unadjusted p-value  Bonferonn p
       44   -2.7297     0.01102      0.50692
```

B. NORMALITY

Table 8.

```
Shapiro-Wilk normality test

data:  res1
W = 0.97325, p-value = 0.3122
```

Shapiro Wilk test follows a null hypothesis stating that the sample came from a Normal distribution. Since p value of the test is

greater than .05, the null hypothesis stated above is not rejected. We are 95% confident that the sample follows a Normal distribution.

C. CONSTANCY OF VARIANCE

```
Non-constant Variance Score Test
Variance formula: ~ fitted.values
Chisquare = 0.1044646 Df = 1 p = 0.7465364
```

Breusch-Pagan test was used to identify if the constant variance assumption was satisfied. This test has a null hypothesis that states that the data has constant variance.

Since the p value is greater than .05, we do not reject null hypothesis. Thus, the sample has constant variance.

A. MULTICOLLINEARITY

Table 4: Variance Inflation Factor (VIF)

Variable	GVIF	Df	GVIF^(1/(2*Df))
Gender	1.354540	1	1.163847
Age	14.420327	1	3.797411
Marital.Status	10.741068	1	3.277357
Children	11.086188	1	3.329593
No..of.children.at.home	1.748446	1	1.322288
Occupation	292.174009	5	1.764266
Job.Years	37.749435	1	6.144057
Years.in.MMC.ER	13.630881	1	3.692002
ER.Station..Main.	24.340227	9	1.194038

Correlation Matrix of Demographic variables and job characteristics

	Age	No. of children @ home	Job.years	Years in mmc.er
Age	1.00	0.21	0.87	0.62
No. of children @ home	0.21	1.00	0.22	0.17
Job.years	0.87	0.22	1.00	0.81
Years in mmc.er	0.62	0.17	0.81	1.00

Multicollinearity is the case where two or more of the independent variables in a regression model are moderately or highly correlated. Variance inflation factor (VIF) quantifies the amount of variance inflated. Square root of the VIF greater than two suggests a multicollinearity on the variable. On table 4, Job years possess multicollinearity problem. Based on the correlation matrix, Job Years is highly correlated with Age and Years in MMC ER. Job Years will be removed in the modeling procedure to avoid problem of multicollinearity.

Modelling- STEPWISE SELECTION:

Initial Model:

```
tCS ~ Gender + Age + Marital.Status
+ Children + No..of.children.at.hom
e +
    Occupation + Years.in.MMC.ER +
ER.Station..Main.
```

Final Model:

```
tCS ~ 61.653 - 12.320(Single Marita
l Status) - 8.762 (With Children)
```

```
Multiple R-squared:  0.1028,
Adjusted R-squared:  0.06458
```

Using the stepwise selection technique, marital status and presence of children are the two independent variables that were deemed significant.

The final model states that if the employee is single, its compassion satisfaction score decreases by 12.320 units and if the employee has a child, its compassion satisfaction score decreases by 8.762 units. Also, the two significant variables can explain 6.458% of the variability of compassion satisfaction score.

Secondary Traumatic Stress

Full Model

t- score for Secondary Traumatic Stress = Gender + Age + Marital Status + Children + No of children at home + Occupation + Job Years + Years in MMC ER + ER Station Main

Assumption Checking

A. OUTLIERS

There is no studentized residual with Bonferonni p < 0.05. Therefore, no outlier is present.

```
Largest |rstudent|:
    rstudent unadjusted p-value Bonferonni p
       44       3.09854     0.005      0.2073
```

B. NORMALITY

```
Shapiro-Wilk normality test

data:  res1
W = 0.98712, p-value = 0.8574
```

Shapiro Wilk test follows a null hypothesis stating that the sample came from a Normal distribution. Since p value of the test is greater than .05, we do not reject the null hypothesis stated above. We are 95% confident that the sample follows a Normal distribution.

C. CONSTANCY OF VARIANCE

```
Non-constant Variance Score Test
Variance formula: ~ fitted.values
Chisquare = 2.280415   Df = 1    p = 0.1310168
```

D. MULTICOLLINEARITY

Table 5: Variance Inflation Factor (VIF)

Variable	GVIF	Df	GVIF^(1/(2*Df))
Gender	1.354540	1	1.163847
Age	14.420327	1	3.797411
Marital.Status	10.741068	1	3.277357
Children	11.086188	1	3.329593
No..of.children.at.home	1.748446	1	1.322488
Occupation	292.174009	5	1.764266
Job.Years	37.749435	1	6.144057
Years.in.MMC.ER	13.630881	1	3.692002
ER.Station..Main.	24.340227	9	1.194038

Correlation Matrix of Demographic variables and job characteristics

	Age	No. of children @ home	Job.years	Years in mmc.er
Age	1.00	0.21	0.87	0.62
No. of children @ home	0.21	1.00	0.22	0.17
Job.years	0.87	0.22	1.00	0.81
Years in mmc.er	0.62	0.20	0.82	1.00

On table 5, Job years possess multicollinearity problem. Based on the correlation matrix, Job Years is highly correlated with Age and Years in MMC ER. Job Years will be removed in the modeling procedure to avoid problem of multicollinearity.

Modelling- STEPWISE SELECTION:

Initial Model:

```
tSTS ~ Gender + Age + Marital.Status + Children + No..of.children.at.home +
    Occupation + Years.in.MMC.ER + ER.Station..Main.
```

Final Model:

```
tSTS ~ 1
```

Using the stepwise selection technique, no independent variables were deemed significantly associated with the secondary traumatic score.

Burn Out

Full Model

t- score for Burn Out = Gender + Age + Marital Status + Children + No of children at home + Occupation + Job Years + Years in MMC ER + ER Station Main

Assumption Checking

A. OUTLIERS

There is no studentized residual with Bonferonni p < 0.05. Therefore, no outlier is present.

```
Largest |rstudent|:
    rstudent unadjusted p-value Bonferonni p
      44      2.578531  0.0157       0.72194
```

B. NORMALITY

```
Shapiro-Wilk normality test

data:  res1
W = 0.96645, p-value = 0.1654
```

Shapiro Wilk test follows a null hypothesis stating that the sample came from a Normal distribution. Since p value of the test is greater than .05, we do not reject the null hypothesis stated above. We are 95% confident that the sample follows a Normal distribution.

C. CONSTANCY OF VARIANCE

```
Non-constant Variance Score Test
Variance formula: ~ fitted.values
Chisquare = 0.2557692  Df = 1  p = 0.6130418
```

Breusch-Pagan test has a null hypothesis that states that the data has constant variance.

Since the p value is greater than .05, we do not reject null hypothesis. Thus, the sample has constant variance.

D. MULTICOLLINEARITY

Table 6: Variance Inflation Factor (VIF)

Variable	GVIF	Df	GVIF^(1/(2*Df))
Gender	1.354540	1	1.163847
Age	14.420327	1	3.797411
Marital.Status	10.741068	1	3.277357
Children	11.086188	1	3.329593
No..of.children.at.home	1.748446	1	1.322288
Occupation	292.174009	5	1.764266
Job.Years	37.749435	1	6.144057
Years.in.MMC.ER	13.630881	1	3.692002
ER.Station..Main.	24.340227	9	1.194038

Correlation Matrix of Demographic variables and job characteristics

	Age	No. of children @ home	Job.years	Years in mmc.er
Age	1.00	0.21	0.87	0.62
No. of children @ home	0.21	1.00	0.22	0.17
Job.years	0.87	0.22	1.00	0.81
Years in mmc.er	0.62	0.17	0.81	1.00

On table 6, Job years possess multicollinearity problem. Based on the correlation matrix, Job Years is highly correlated with Age and Years in MMC ER. Job Years will be removed in the modeling procedure to avoid problem of multi-collinearity.

Modelling- STEPWISE SELECTION:

Initial Model:

```
tBO ~ Gender + Age + Marital.Status
+ Children + No..of.children.at.hom
e +
    Occupation + Years.in.MMC.ER +
ER.Station..Main.
```

Final Model:

```
tBO ~ 44.266 + 6.726(Single Marital
Status)
Multiple R-squared:  0.04863,  Adjus
ted R-squared:  0.02881
```

Using the stepwise selection technique, Marital Status was the only significant variable at 5% level of significance. That is, if the respondent is single, its expected Burn out score increases by 6.726 units. This significant variable can explain 2.881% of the variability of burn out score.

INTERPRETING SCALE SCORES IN COMBINATION

The ProQOL test scale scores were interpreted also in their combinations. A particular combination infers a particular compassion fatigue state for the respondent, if there is any. The different significant combinations are listed below. All negative combinations are recommended to have intervention. Fourteen respondents have been identified for intervention, however only 2 have consented to intervention.

Table 6. ProQOL Combination Scale Scores

High Cs, Mod-Low BO, Mod-Low STS*		High BO, Mod-Low Cs, Mod-Low STS		High STS, low Cs, low BO		High STS, High Cs, low BO		High STS, High BO, Low Cs		Respondents eligible for intervention	
Doctor	Nurse	Doctor	Nurse	Doctor	Nurse	Doctor	Nurse	Doctor	Nurse	Doctor	Nurse
5	7	4	2	2	0	2	2	1	1	9	5
12		6		2		4		2		14	

* Cs – Compassion satisfaction, BO – Burn out, STS – Secondary traumatic stress

HIGH COMPASSION SATISFACTION, MODERATE TO LOW BURNOUT AND SECONDARY

TRAUMATIC STRESS

Over 12 respondents had this combination (5 doctors and 7 nurses). This is the most positive result. This result represents a person who receives positive reinforcement from their work. These persons may benefit from engagement, opportunities for continuing education, and other opportunities to grow in their position.

HIGH BURNOUT, MODERATE TO LOW COMPASSION SATISFACTION AND SECONDARY TRAUMATIC STRESS

Six respondents had this result (4 doctors and 2 nurses). People who score high on burnout, in any combination with the other scales, are at risk as individuals and may also put their organizations in high-risk situations. Burnout is a feeling of inefficacy. In the work setting, this may be a result of personal or organizational factors. The prototype burnout is associated with high workloads. . People suffering from burnout often benefit from taking time off. They may also benefit from changing their routine within the organization.

HIGH SECONDARY TRAUMATIC STRESS WITH LOW BURNOUT AND LOW COMPASSION SATISFACTION

Two respondents had this result (2 doctors, both consultants). People who make these scores are typically overwhelmed by a negative experience at work as characterized by fear. . These people are likely to benefit from immediate treatment for traumatic stress and, when present, depression. Countering the fear might include changing the case-load mix, the work environment (like assigning work with colleagues whom they trust), or introducing other safety measures.

HIGH SECONDARY TRAUMATIC STRESS AND HIGH COMPASSION SATISFACTION WITH LOW BURNOUT

Over 4 respondents had this combination (2 doctors and 2 nurses). This combination is typically unique to high-risk situations such as working in areas of war and civil violence. People who score in this range are often highly effective at their work because they feel their work matters. However, they have a private self that is extremely fearful because of their engagement with others. People with scores like this typically benefit from encouragement to build on their feelings

of altruism and thoughts that they are contributing to the greater good. Simultaneously, their fears and fear-related symptoms should be addressed

HIGH SECONDARY TRAUMATIC STRESS AND HIGH BURNOUT WITH LOW COMPASSION SATISFACTION

Two respondents had this result (1 doctor and 1 nurse). This combination is seemingly the most distressing. Not only does the person feel overwhelmed and useless in the work setting, they are literally frightened by it. People with this combination of scores are probably helped most by being removed from their current work setting. Assessment for PTSD and depression is important.

CONCLUSIONS

Compassion fatigue, which is defined as the negative aspects of care taking, is divided into burn out or secondary stress. The prevalence of burn out in the ED was found to be 25.5% and the prevalence of secondary stress was found to be 19.61%, both which are roughly a quarter of the respondents. Fourteen respondents were identified for intervention. However, only 2 individuals consented to be referred to an intervention program. The researcher suggests that hospital practice guidelines and programs in addressing compassion fatigue may be implemented. This will ensure that the long-term health of medical staff--and in turn—patient health will be addressed.

Demographics identified to be associated with compassion fatigue (burn out) were marital status (single) and having children. Specifically, if an employee is single and if an employee has a child it is associated with lower compassion satisfaction. Specifically, if a respondent is single, compassion satisfaction score decreases by 12.320 units and if the employee has a child, its compassion satisfaction score decreases by 8.762 units. If the respondent is single it is associated with increased burn out, specifically the expected Burn out score increases by 6.726 units.

Job characteristics (job assignment, number of years working, number of years in ED and ER station) had no significant association with compassion satisfaction and compassion fatigue (burnout and secondary traumatic stress).

The ProQOL test scale scores were interpreted also in their combinations. A particular combination infers a particular compassion fatigue state for the respondent, if there is any. It was found that over 14 respondents had compassion fatigue that required intervention, however, only 2 respondents consented to be referred. These 2 respondents (identified to be both resident physicians) will be referred to the proper intervention program and the training officer informed for follow up.

Ethics and Human Subjects Issues

Participants were presented with a Confidentiality Statement and Informed Consent Form before they are asked to engage in the survey. Participants were assured that participation in the research study is voluntary. They were informed that they have the right to withdraw at any time or refuse to participate entirely without jeopardy to their occupation.

Participants were informed before participating in the survey that there is support in case they are identified to have compassion fatigue. They may avail of said support if they consent to it. They were also asked of their consent to be identified in the case they have compassion fatigue and be referred for follow up care. Being identified will entail them being contacted by the researcher through contact information they will provide and to inform their superiors that they will be referred to a program. If they consent, they will be asked to provide their contact information (mobile number and email) in sealed envelopes, which will be opened only in in the event of them being noted for compassion fatigue. The survey will only proceed once the participant has understood and signed the Informed Consent Form.

All participant information provided will remain confidential and will only be reported as group data with no identifying information. Survey forms will be coded with no identifying information. All data, including questionnaires will be kept in a secure location and only those directly involved with the research will have access to them. Said data will be used only for the purposes for which it was intended and shall be protected from unauthorized disclosure.

Participant Follow Up and After Care

In the event that participants are at risk for compassion fatigue , they will be referred to current programs in Makati Medical Center to address it (provided they have consented to be identified and referred):

1. For physicians (consultants and residents): They will be referred to the Medical Staff Committee on Well-Being of Physicians (as mentioned in p. 72 of the Makati Medical Center Medical Staff Bylaws and Rules & Regulations, 2004). The committee will use internal and external resources to help physician staff.
2. For nurses: They will be referred to the Corporate Health Clinic. Currently, stress debriefing is offered for nursing staff.

It was found that consenting 2 respondents (both resident physicians) were identified to have compassion fatigue and eligible for intervention. Consenting individuals were contacted through the mobile number and email address that they provided by the researcher for referral. The training officer and the head of the Physician Wellness Program were contacted to follow up these individuals.

Strengths and Weaknesses of the Study

The strength of this study is that there is data for the first time from Makati Medical Center measuring the prevalence of compassion fatigue in Emergency Department physicians and nurses. However, the study is limited in terms of the sample population and size. Participants are limited to the Emergency Department and in Makati Medical Center only. The questionnaire turn -out was also poor despite encouragement and placement of the questionnaire drop off boxes.

Public Health Significance

It has been found that the psychological morbidity of compassion fatigue affects the quality of care delivered to patients, as well as the professional and personal life of the health care worker [20]. This study is significant because it will document whether if there is significant levels of compassion fatigue among Emergency Department physicians and nurses. It was found that more than a quarter of the ER hospital staff was found to have compassion fatigue. However, only 2 individuals consented to be referred to an intervention program. The researcher suggests that hospital practice guidelines and programs in addressing compassion fatigue may be implemented. This will ensure that the long-term health of medical staff--and in turn—patient health will be addressed.

BUDGET AND MOTIVATION

The motivation behind this proposed study is the desire to investigate the prevalence of compassion fatigue in the Emergency Department. Budget of this study is from the researcher's own expense.

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Risk analysis on emergency preparedness among health emergency managers in the Province of Negros Occidental

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Abstract

This descriptive study look at the extent of emergency preparedness among health emergency managers of the 31 local health units in the Province of Negros Occidental, that is located in central Philippines. Hazard, vulnerability and capacity assessments were based on standardized questionnaire cognizant with Department of Health and; generated from the tools of Department of Science and Technology. Assessments were then integrated expressed through a risk index. Higher indices will be more at health risks from injuries, illnesses and deaths in the community. Results showed that 70.97% of health emergency managers are from the Technical and Nursing Division of the local health unit where majority are females (51.61%). Majority of them (87.10%) do not have any post-graduate studies or specialties aside from their current professional degree. The study reflected that Municipality of Cauayan has the highest index of risk (2.41) followed by Murcia (2.04) where it needs further emergency preparedness. Seven local health units are poorly prepared (1.00-1.49) while majority of the local health units (19 out of 31) in the province are satisfactorily prepared in health emergencies and disasters with indices of risk between 0.50 – 0.99. Municipality of Calatrava in the north, La Carlota City in the midland and Hinigaran health unit in the south are very prepared (<0.49). These projection of probable hazard outcomes and vulnerability awareness enable health emergency managers establish emergency preparedness by capacity development.

Keywords: risk analysis, emergency preparedness, emergency medicine, disaster medicine

INTRODUCTION

Philippines is a habitation for emergencies and disasters brought about by hazards from natural (earthquakes, floods, typhoons) to man-made or human-initiated (stampede, armed conflicts, vehicular accidents and the like). The February 2012 earthquake in the Negros Island, Central Philippines signify that local governments have a crucial role in safeguarding the community most especially during disasters taking the lead in risk assessment, information sharing, decision making and operations.[29] Typhoon *Yolanda* (international name: Haiyan) in 2013 called for multi-sectoral challenges in terms of emergency preparedness and lessons learned brought about by the complexity of such disaster. The recent Sendai Framework for Disaster Risk Reduction 2015-2030 called to strengthen a people-centered, multisectoral forecasting on disaster preparedness.[42]

The impact of emergencies, when not addressed immediately from local resources, can be overwhelming leading to disasters causing greater harm requiring external assistance. The most vulnerable sectors include the poor, the sick, people with disabilities, elderly, women and children.[11] It is more reflective to think that even health emergency managers, in countries whose government possess the most highly advanced emergency management and capacities development, still found the need to warn the people beforehand in preparation for any emergencies and disasters.[4]

Since emergency preparedness measures in most localities are activated and to some are scarce, public managers still find it difficult to assess the quality of their existing emergency

management programs.[18] The country is challenged to come up with and implement a comprehensive health emergency preparedness plans for disasters and epidemics at the community level.[26]

Background:

Emergency management appeared primarily during the 1950s leading to extensive mitigation, preparedness, response and recovery planning especially for man-made hazards.[4] Incident command system (ICS) in the early 1970s was developed to address communication problems in this management resolving differing organizational structures and unclear lines of authority.[37] The ICS had been adaptable to multiagency responses.[41] Paradigm shift of these response activities during emergencies and disasters took place in the 1980's. Emergency and disaster management gradually emphasize towards risk reduction and preparedness activities in the 1990's and beyond.

Emergency preparedness strategies in 2009 were aligned to capacity development including reevaluation of existing emergency plans, public-private sector partnership, comprehensive risks assessment, resource mobilization and fund generation.[33] It was in 2010 when these strategic measures was enacted and operationalized into a national policy in the Philippines, the Republic Act 10121 or the, "Philippine Disaster Risk Reduction and Management Act." It strengthened collaboration of sectors and stakeholders and the existence of National Disaster Risk Reduction and Management Council (NDRRMC) along with respective councils at the local level.[11] NDRRMC comprise 12 government agencies including the Department of Health (DOH). DOH-Health Emergency Management Bureau (DOH-HEMB), leads and guides the NDRRMC on health issues and risks involved in emergencies and disasters. Five years after the implementation of the Republic Act 10121, there remained the need for it to gain acceptance in the provinces more so in respective local health units.

The Province of Negros Occidental in the focus of the study, also experienced varied emergencies and disasters for the past years. The Magnitude 6.2 earthquake in 2011 affecting south of the province had disrupted socio-economic services, created panic among 8,000 residents fleeing to higher grounds for fear of tsunami.[16] Man-made hazard like armed conflicts and social unrests remain to occur in the hinterland of the provinces that lead to injuries and deaths. Current scenario is the Mount Kanlaon, one of the most active volcano in the country, that continue to spew ash since December 2015 and in Alert Level 1, displacing communities and affecting livelihood.[13] These events have been reflective of how local health units and disaster risk reduction and management councils should properly coordinate its emergency preparedness programs for public health and safety.

It is in the aforementioned aspects where this study had been conceptualized as there had been no previous studies on risk analysis on health emergency preparedness being done involving health emergency managers of local health units in a Provincial Level. The study will valuably complement how health emergency managers view emergency preparedness as a means to prevent disasters.

Review of Related Literature:

Hazard identification

Hazard is any *potential* threat to public safety and/or public health. There are two kinds of hazard in the context of public health and emergency management: Natural and Man-made / Human-initiated.[11] There are six volcano monitoring observatories in the Philippines and one of which is situated at Barangay Cubay, La Carlota City in the Province of Negros Occidental.[38]

Hydro-meteorological hazards on the other hand, are natural hazards of deviations in the normal water cycle causing loss of life, health impacts, social disruption and economic damage.[21] These include flashfloods, storm surge and rainfall induced landslides. Meteorological hazards include tropical storms, typhoons and monsoons. Out of the average 20 typhoons in the country, 7 of which are destructive annually.[30] New storm surge warning system was developed by DOST-PAGASA in 2015 through its Project Nationwide Operational Assessment of Hazards (NOAH).[27]

Man-made or human-initiated hazards include but not limited to: (1) Biologic hazard (disease outbreaks, contamination); (2) Technological hazards (industrial/occupational, chemical, transport accidents, pollution and; (3) Societal hazards (acts of "terrorism", social and armed conflicts, stampedes, insurgencies). Societal hazards can brought about psychosocial stress, displacement of the population, breakdown in security and worst damage to communication networks, facilities and more deaths.[8]

There are methodological tools for database of effects of hazards like the DesInventar database in Latin American Countries by Rodriguez-Oreggia, *et al.* in 2008.[35] The system follows a process of recording information including disaster effects to housing, population and services on local government units. Hazard maps are provided seeing some patterns of distribution to capacitate municipalities through regulations and contingency planning. Hazard identification and evaluation should also be aimed for the informal sector.[19]

The likelihood of hazard consequences can be described as low risk or not likely or medium risk or one having the high likelihood of occurring.[31] One of the causes of risks to destruction and death are attributed more on extreme natural hazards that are beyond man's control rather than human-induced.[40] Social scientists on the other hand, focus on how risk is perceived and how information is processed for decision-making given the hazards and vulnerabilities.[23]

Vulnerability assessment

Vulnerability measures how susceptible an area, individual, group or community is to the consequences of a hazard. These include: (1) Intrinsic Factors that include extremes of age, health status, level of education, physically challenged individuals and; (2) Extrinsic Factors describing location, crowding, accessibility to social services and cultural practices like sanitation and hygiene.[6] Assessments can be integrated into a vulnerability map of a community combined with an aggregated hazard map to create an overall risk map.[22]

Community

In the context of protecting public safety, a community is a group of people consisting of 5 Elements: people, property (facilities and infrastructures), services (government, non-government, commercial), livelihood (urban and rural) and; environment (air, water and soil; built and natural).[8] Communities should prepare for emergencies as resources are easily pooled and first response emanate in their level. If communities are capacitated, sustained development is achieved.[43]

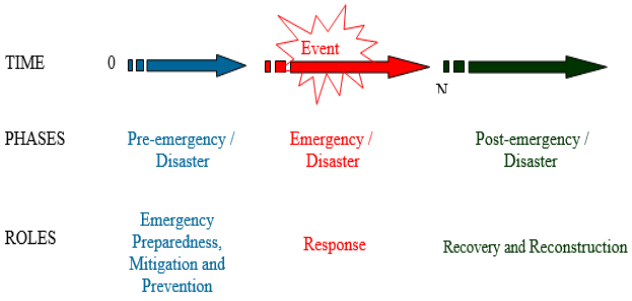
Concept of risk

Risk in this study, pertains to health risk on emergencies and disasters (injuries, illness and death). This is an anticipated consequences of a hazard interacting with a vulnerable community at a specific time, that is, RISK = HAZARD x VULNERABILITY.[6] The probability of a specified outcome in risk may be presented as a numerical range (that is 30% to 40% probability) or in relative terms (that is low, moderate or high risk). Health risk can be estimated through an index using assessment tools in the form of a questionnaire. The Department of Health in the country adopts strategies in managing health risk to reduce threats and consequences to public health and safety.

These strategies include: (1) preventing hazard exposure; (2) vulnerability reduction and; (3) capacity development.[9]

Emergency management

Comprehensive management is based upon the four functional components: (1) Mitigation; (2) Preparedness; (3) Response and; (4) Recovery. In reality, these functions are phases that intermixed with each other and in varying degrees before, during and after disaster strikes. Figure 1 shows timeline of health sector roles by



Health Emergency Management Phases.[44]

Figure 1. Timeline of health sector roles by health emergency management phases.

Preparedness Phase, the focus of this study, involves capacitating people and uses tools or measures to increase likelihood of survival and to minimize socio-economic impacts of emergencies and disasters. In order to reduce risks, these must be communicated, vulnerability reduced and capacities of the community staff, infrastructure and healthcare facilities be strengthened.

Risk assessment process

This process involves three steps (Figure 2):[20]

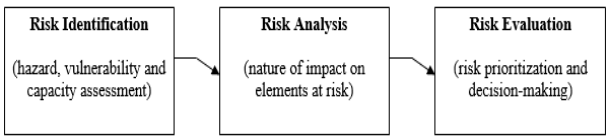


Figure 2. Risk assessment process.

Risk identification involves: (1) hazard assessment the community can be exposed through identifying its likelihood and occurrence; (2) vulnerability assessment involving elements of the community and; (3) capacities assessment where this identify developments how the community can handle the risks. Risk analysis forecast consequences of hazards interacting with the elements of the community.[9] Different hazards may have differing impact upon on various elements in the community given a particular locality. Analysis of the risk takes account the functional relationship:

RISK = (HAZARD)(VULNERABILITY) / CAPACITY.[10] Risk Evaluation on the other hand, is prioritizing process guiding authorities in their decision making from risk analysis on potential strategies on how to deal with these risks.

Risk assessment can provide necessary baseline information that is useful in assessing capacity of the community for future emergency response purposes. Ainuddin and Routray studies in Pakistan had used key informant interviews and focused group discussion on disaster-related issues being handled at a provincial level though have not extended preparedness assessment in a local setting.[1] The *all hazards approach* is adopted in health emergency management as communities may be vulnerable to wide range of hazards. This involves developing plans encompassing all the needs for the risk that might be involved in emergencies.

Emergency preparedness

This is a process of preparing a community, an organization or an activity for emergencies where prevention initiatives are developed from vulnerability assessments as a means of risk reduction.[43] Frameworks in public health emergency preparedness in the community level should be recognized by the health workforce be consistent with the national incident management system.[15] Said et al. have shown that this community-based approach is also a viable

tool in enhancing community preparedness to tsunami and other types of disasters.[36]

The following are ten P's that encompass strategies and elements for emergency preparedness in health emergency management:[46]

1. *POLICIES –implementing rules for functioning activities*
2. *PLANS – all-hazards approach comprising strategies distinct for the locality*
3. *PEOPLE'S CAPABILITY – training needs assessment; provision of personal protective equipments for responders' welfare and safety; recognition of outstanding performances.*
4. *PARTNERSHIP BUILDING – organization of the health sector; issuances of memorandum of agreement/understanding with stakeholders; proper referral systems; networking activities with other agencies and organizations. The best example for partnership building is the Cluster Approach.*
5. *PHYSICAL INFRASTRUCTURE – establishment of Emergency Operation Centers; procurement of needed communication equipment and supplies; equipped emergency room in health care facilities.*
6. *PROGRAMS FOR HEALTH – specific health programs in order to address health concerns during an emergency. Some of these are: Nutrition, Water Supply, Sanitation and Hygiene, Mental Health and Control of communicable diseases.*
7. *PESO AND LOGISTICS – fund allocation; resource inventory and mapping.*
8. *PROMOTIONS – advocacy activities; develop information, education and communication (IEC) materials; risk communication; mass media management; observance of national disaster consciousness month (July).*
9. *PERFORMANCE ACTIVITIES – monitoring and evaluation*
10. *PRACTICES – proper documentation of activities ; sharing of best practices*

Capacity development

The capacity of the community is attached to the strategies that evolved from emergency preparedness. Despite possible resource inadequacies, people can build resilience through organizational linkages, enhancing support, planning and improve decision-making skill. Local health unit and health care facilities prior to health emergency undertake capacity development activities in managing all types of hazards to systematically carry out response and recovery.[8] These activities are:

a. *Development of Policies, Guidelines, Procedures and Protocols for health emergency management*
b. *Development of Health Emergency Preparedness, Response, Recovery and Rehabilitation Plans (HEPRRP)*
c. *Development of the Organization (management structures, incident command system)*
d. *Physical Infrastructure Development (operation center)*
e. *Systems Development (from early warning systems, networking to logistics)*

Health emergency manager

A key personnel in the local community under the guidance of the Health Emergency Management Staff (HEMS) of the Department of Health. Roles encompass from policy and guidelines development, networking, advocacy to monitoring and evaluation of all emergency and disaster-related activities.[34] HEMS currently streamlined to Health Emergency Management Bureau (HEMB) to continually harmonize health sectors' role to emergencies and disasters covering emergency preparedness programs, response and recovery operations. Health emergency and disaster preparedness programs was brought in the Province of Negros Occidental in March, 2006 to properly coordinate with local government units and different sectors in preparedness-response-recovery systems.[39] The establishment of a Provincial Health Emergency Network by the Provincial Health Office in Negros Occidental presently coordinate with non-government organizations and stakeholders to strengthen collaboration in relation to public health and emergency management in the province.[14]

Cluster approach

The United Nations introduced the Cluster Approach to mobilize groups of agencies and organizations to coordinate, share information and respond in strategic manner.[45] Institutionalization of this approach in the Philippine Disaster Management System was established in May 10, 2007 under then National Disaster Coordinating Council Circular No. 05, s-2007 and later amended in October, 2008 to include designation of cluster

leads and their terms of reference at the national, regional and provincial levels (Table 1).

Table 1. Roles and Functions of Government Cluster Lead Agencies in Emergencies and Disasters.

CLUSTER	GOVERNMENT LEAD
Food and Non-food Items	Department of Social Welfare and Development (DSWD)
Camp/Internally Displaced Person Management, Emergency Shelter and Protection	DSWD
Permanent Shelter and Livelihood	DSWD
Water Supply, Sanitation and Hygiene (WASH), Health, Nutrition and Mental Health and Psychosocial Services Support (MHPSS)	**Department of Health (DOH)**
Logistics and Emergency Telecommunications	Office of Civil Defense / NDRRMC Operations Center
Education	Department of Education
Agriculture	Department of Agriculture
Early Recovery	Office of Civil Defense

In the Provincial Level, Provincial Disaster Risk Reduction Management Council develops baseline data of provincial demography, sectoral data and other needed information to facilitate rapid assessment of affected areas, timely resource mobilization and urgent delivery of assistance.[46] The health sector, DOH as the lead agency, has its major role in the event of emergencies and disasters: (1) Water Supply, Sanitation and Hygiene; (2) Health particularly Communicable Disease Control Measures; (3) Nutrition and; (4) Psychosocial Services.

Interlocal Health Zone

The Interlocal health zone (ILHZ) is a form of inter-local government unit cooperation organized for collective health of the community. This ensures continued access of services necessary for the health needs of the people within the member cities and municipalities. A functional ILHZ improves the health status and coverage of public health intervention of the zonal population and exhibited efficiency in mutual operations of the inter-local health services.[5] An exemplary health practice of an interlocal health zone includes cost effective health programs consistent with the thrusts of the DOH and; mobilize and utilize indigenous resources with minimal support from external sources.[7] In response to strengthening health emergency services at the local level, the provincial government of Negros Occidental already established ILHZ in 2000 (Figure 3).[32] Each zone comprises a core referral hospital, identified referral hospitals and local health units that seek to improve health care delivery within the jurisdiction of member localities.[28]

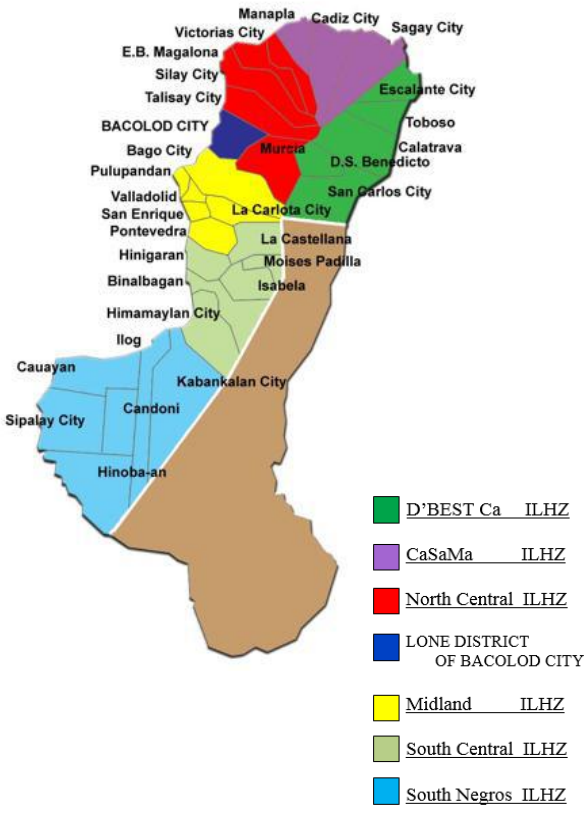


Figure 3. Interlocal Health Zones in Negros Occidental

Objectives:

This study will seek to answer the following questions:

1.What is the profile of Health Emergency Manager that coordinates emergency preparedness of each local health unit ?

2.What are the established hazards in the Province of Negros Occidental according to the following classification:

2.1Natural Hazards

2.2Man-made / Human-initiated Hazards

3.What is the level of importance of the health units in addressing the health needs of the following vulnerability in the event of emergencies and disasters:

3.1People

3.2Property

3.3Health services

3.4Livelihood

3.5Environment

4.What is the extent of the local health units' capacities for emergency preparedness in terms of:

4.1Development of Legal Framework for health emergency management

4.2Development of Plans

4.3Development of the Organization

4.4Physical infrastructure development

4.5Development of systems in preparing the health unit before emergencies and disasters occur

5.What is the index of risk of local health units through risk analysis based on health emergency managers' perspectives on hazard, vulnerability and capacity assessments ?

Significance:

The outcome and findings of this research will be valuable to the:

(a)**Community**. Information will be the key towards public awareness of the hazards vital to any efforts in decreasing susceptibility to health risks during emergencies and disasters.

(b)**Health care providers**. Public health sector and private facilities can strengthen their networks.

(c)**Health emergency managers**.

(d)**Local health units**. Reassessment of existing emergency preparedness plans to update risk reduction programs.

(e)Provincial health office. Generate baseline information on initiating an integrated Provincial Health Emergency, Response and Recovery Plan.

(f)Provincial Government Unit. This study can assess the extent of the communities in implementing emergency preparedness and their need for technical assistance from the provincial government especially on health governance.

This study is highly significant as there had been no previous studies that would analyze health risks in terms of health emergency managers' perspective on emergency preparedness integrated with hazard tools in a Provincial Level.

METHODOLOGY

Study design and setting:

The study is a descriptive evaluative design, prospective in nature, in assessing the health emergency management in the Province of Negros Occidental located in central Philippines. This will look at the extent of emergency preparedness of the local health units through a risk analysis involving hazard, vulnerability and capacity assessments in pre-emergencies and disaster. The focus of the research is on the

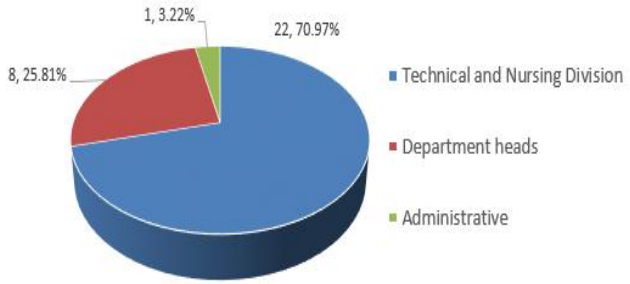
Emergency Preparedness Phase among the three phases of Health Emergency Management.

Research instrument:

Sampling procedure used in the study is total enumeration where a master list of health emergency managers among the local health units in the province was validated at the Provincial Health Office. Informed consent and mechanics in answering the questionnaire were discussed among the respondents. Part I of questionnaire include profiling of respondents (age bracket, sex, current work position and field of specialization and trainings). Part II contains Man-Made/Human-Initiated Hazard (biological, technological and societal) Assessments; Part III the Vulnerabilities of the community that needs to be addressed in the locality and; Part IV Capacity Assessments of respective local health units looking at the level of implementing capacity developments in emergency preparedness. On the other hand, Natural Hazards assessment were obtained from the database generated from: (1) Rapid Earthquake Damage Assessment System (REDAS) version 2.8 Tool of the Department of Science and Technology – Philippine Institute of Volcanology and Seismology (DOST-PHIVOLCS)[2] mapping geologic hazards from earthquake-induced landslides to Mount Kanlaon pyroclastic flows in the province and; (2) Providing Regional Climates for Impact Studies (PRECIS) Model[12] from DOST – Philippine Atmospheric, Geophysical and Astronomical Services Administration (DOST-PAGASA) projecting extreme weather events of seasonal temperature and rainfall. Storm surge projections was utilized using the DOST – Project Nationwide Operational Assessment of Hazards (NOAH).[25] Processing involved collation of information from the answered questionnaires and generated database.

Inclusion Criteria:

- Health emergency manager in emergency preparedness operations
- Working in a local health unit
- Recognized by local chief executive
- Working environment is in line with DOH-HEMB emergency preparedness operations
- Natural hazard database from a government organization



Exclusion Criteria:

- Health emergency manager in response and recovery operations
- Respondents in lone districts and highly urbanized cities defined by Local Government Code of 1991

Statistical analysis:

Descriptive statistic was employed in the study. The Likert Scaling used from the generated database of Natural Hazards and from Parts of the questionnaires were interpreted to a score expressed in percentages. Each variable (hazard, vulnerability and capacity) in the study had been individually treated accordingly and integrated according to their relationships with one another in order to arrive with the risk analysis expressed through a risk index, the final output of the study. Generated risk indices in this study were interpreted as:

≤ 0.49 : Very prepared

0.50 – 0.99 : Satisfactorily prepared

1.00 – 1.49 : Poorly prepared

≥1.50 : Needs preparation

Risk index would imply that local health units with higher indices are more at health risk from hazards and vulnerabilities compared to those with lower indices. Increasing the degree of capacity or preparedness enable to lower the risks from injuries, diseases and deaths in the community in the event of emergencies and disasters. Risk analysis on emergency preparedness through index of risk was mapped out accordingly for the Province of Negros Occidental.

RESULTS

All of the health emergency managers representing the 31 local health units in the province were the respondents of the study. There are Profiling showed that 9 out of 31 health emergency managers in the Province of Negros Occidental or 29.03% were in the age brackets 41-45 years old. The lowest frequencies were in the age brackets 20-25, 56-60 and 61-65 years old (3.23%) accordingly (Table 2). Majority of them are females (51.61%).

Table 2. Health emergency managers' age distribution.

Age (in years)	Frequency	%
20 - 25	1	3.23
26 - 30	6	19.35
31 - 35	2	6.45
36 - 40	2	6.45
41 - 45	9	29.03
45 - 50	3	9.68
51 - 55	6	19.35
56 - 60	1	3.23
61 - 65	1	3.23
Total	**31**	**100.00**

Most of the managers (70.97%) are from the Technical and Nursing Division of the local health unit as shown in Figure 4. The study reflected that designation and appointment as managers entail civil service eligibility and does not preclude fields of specialization. Majority of the respondents (87.10%) do not have any post-graduate studies or specialties aside from their current professional degree (Figure 5).

Figure 4. General distribution of health emergency managers in the province

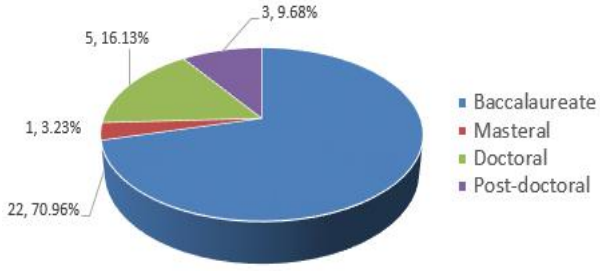


Figure 5. Summary distribution of educational attainment and specialty among health emergency managers.

Hazards in the Province of Negros Occidental

Natural hazards (geologic) assessed were: (1) Groundshaking ; (2) Earthquake-induced Landslide ; (3) Tsunami ; (4) Liquefaction Susceptibility ; (5)

Rain-induced Landslide ; (6) Flood susceptibility ; (7) Mt. Kanlaon Pyroclastic Flow, Lahar Pathways and Lava Flow. The Hydrometeorological hazards considered in this study are: (1) Seasonal temperature changes; (2) Seasonal rainfall changes and; (3) Extreme events (Temperature, Dry Days and Rainfall) and; (4) DOST PAGASA Project NOAH's Storm Surge. Hazard score had been designated given the aforementioned natural hazards and its degree of impact for the province. Figure 6 shows the Natural Hazard Index in Negros Occidental. Bago City and San Carlos City has the highest score of 77.59% and the least score for the Municipality of Murcia (53.45%). Figure 7 on the other hand, shows the Man-made / Human-initiated Hazard in the province. The municipality of Hinobaan has the highest score (56.67%) while E.B. Magalona is the least (20.00%).

The all-hazards assessment is considered a wide range of hazards where vulnerable communities may be exposed to all possible risks in emergencies and disasters. Figure 8 shows the Overall Hazard Index in the Province of Occidental being the Municipality of Hinobaan having the highest overall hazard score of 63.68% while the least of all hazards are assessed for the Municipality of E.B. Magalona (41.90%).

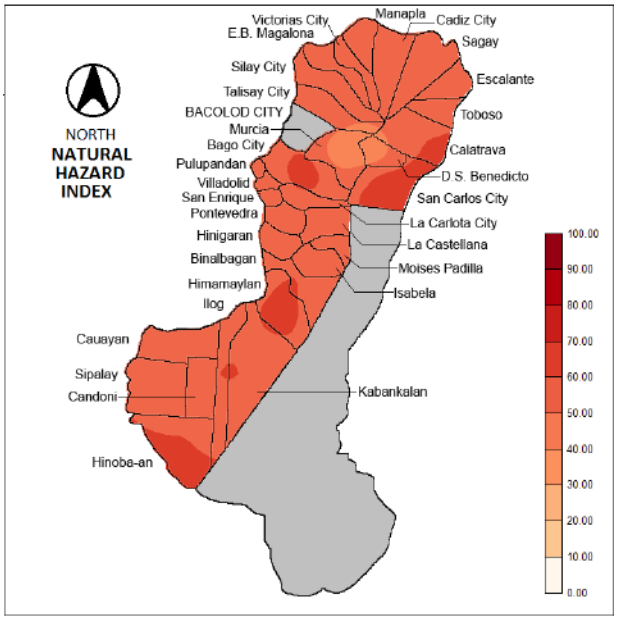


Figure 6. Natural hazard index, Negros Occidental.

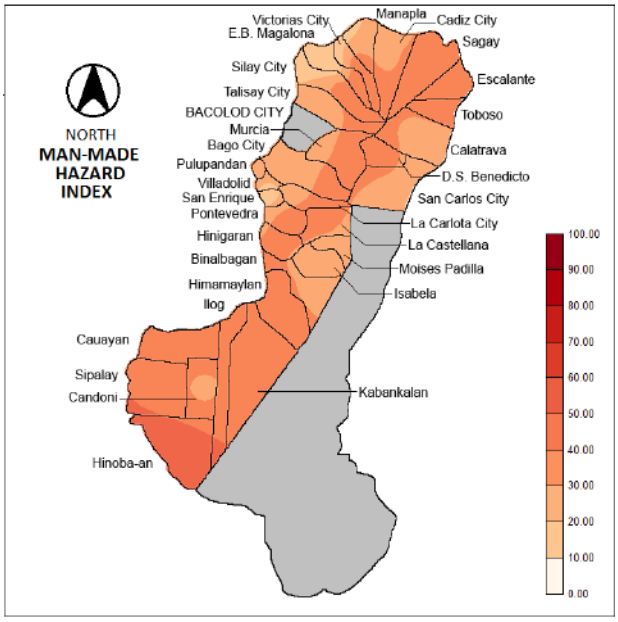


Figure 7. Man-made hazard / Human-initiated Hazard index, Negros Occidental.

Vulnerabilities in the Province

Vulnerabilities in this study are susceptibility factors of the community that increases major health risks to injury, disease or deaths. These include assessments by health emergency managers as to what extent these vulnerabilities had been given importance by respective local health units. Vulnerability scores are done with respect to five elements of community: people, property, health services, livelihood and environment. A higher vulnerability score would mean higher susceptibility of the community to health risks in emergencies and disasters.

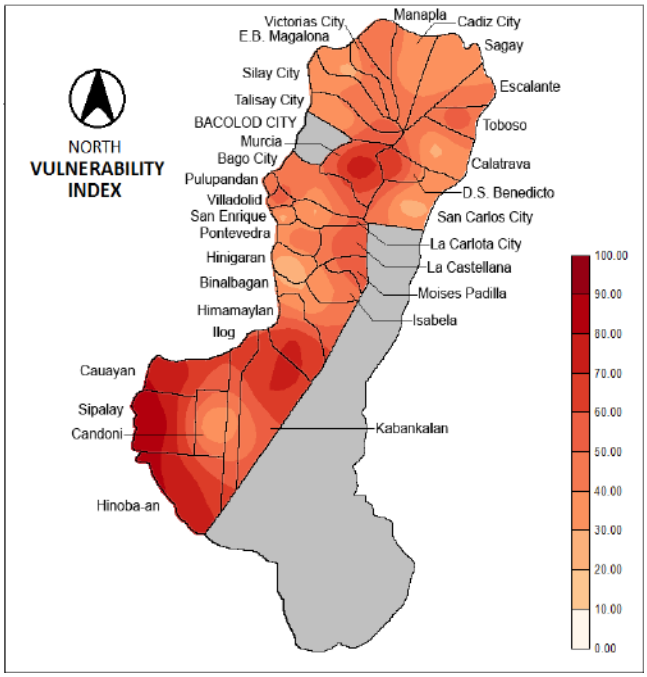
Municipality of Hinobaan has the highest vulnerability (85.00%) of its ***people*** especially those children with poor immunization coverage less than 5 years of age (leading to increased risk of acquiring infections), those physically challenged individuals and elderlies.

Figure 8. All Hazard index, Negros Occidental.

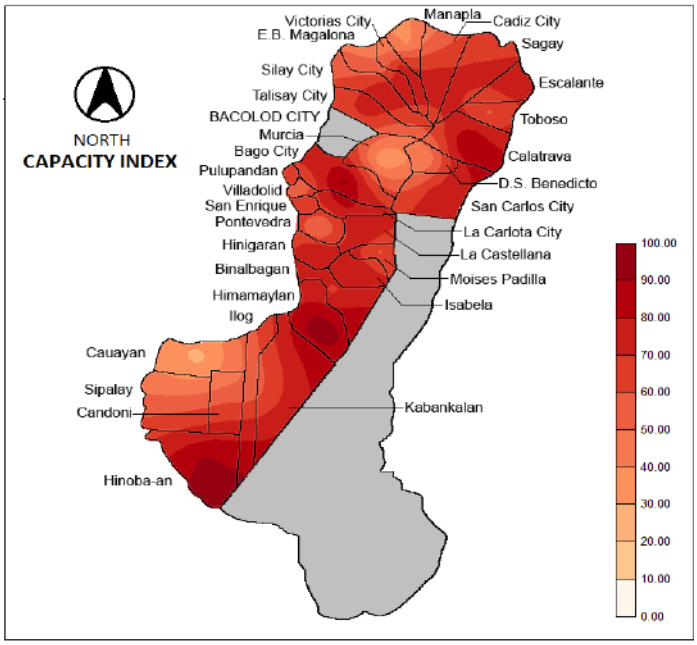
Figure 9. Vulnerability index, Negros Occidental.

The Municipalities of Murcia and D.S. Benedicto should give immediate attention of its local health unit ***properties*** having 93.33% vulnerability. These in particular has to do with the use of vehicles for health service delivery, prioritizing medical supplies in emergencies and disasters and; upgrading of its facilities in consonance with the local engineering department. Kabankalan City, on the other hand, need provisions especially addressing ***livelihood*** concerns in the context of health emergencies and disasters (vulnerability score of 90.00%).

The City of Sipalay has the highest Overall Vulnerability Score (85.00%) of all the localities under study (Figure 9). It is also the most vulnerable community in the province in the event of emergencies and disasters mostly affecting its ***health services*** and the ***environment*.**



Capacity assessments on Health Emergency Preparedness



Capacity was assessed by health emergency managers according to the level of implementation in their respective health units. A scaling of “5” from the questionnaire, for example, would mean that a particular ‘capacity’ is actively implemented for the local health unit with monitoring and evaluation. The ***Development of Legal Frameworks for health emergency management*** in a locality is crucial as it forms the basis in setting priorities and streamlining programs and activities on emergency preparedness. Municipality of Calatrava, Bago City and Himamaylan City are local health units that formally recognized and adopted Republic Act 10121 or “Strengthening the Philippine Disaster Risk Reduction and Management System”. The implementation of policies is also being done through ***Development of Plans*** in relation to health emergency management. Bago City, Himamaylan City and Municipality of Hinobaan (with capacity score of 100%) do have hazard prevention, vulnerability reduction and capacity development plans in their respective local health units.

In terms of ***Development of Organization***, the management structure for emergency preparedness is complete for the local health units of Bago and Himamaylan City, the highest among the locality (100%). Bago City also had the highest capacity score

(100%) in terms of ***Physical Infrastructure Development*** on emergency preparedness. The city has a functioning Operation Center within the local health unit that served as command, control, coordination and communication center during health emergencies and disaster. Almost a quarter of the local health units in the province however, still need to have at least a separate physical and working space for the health emergency managers.

Hinobaan local health unit has the highest capacity score in terms of ***Systems Development*** (94.14%) from Early Warning and Alert Systems to Documentation of Evaluation Activities. However, Himamaylan City local health unit has in place most in its health emergency preparedness items in terms of Development of Legal Frameworks, HEPRRP, Organization, Physical Infrastructure, Public Health Services and Systems Development (with overall Capacity Assessment Score of 96.27%). On the other hand, more Capacity Developments are needed for the Cauayan local health unit (overall Capacity Assessment score of only 27.25%). Figure 10 shows the Capacity index for the Province of Negros Occidental.

Risk analysis on emergency preparedness

Integrating the relationship of Hazards, Vulnerabilities and Capacities in terms of Emergency Preparedness in the Province of Negros Occidental, Table 3 shows the Index of Risk of each local health unit in the province. The table also reflects the index of risk if it would be based according to Interlocal Health Zoning.

The local health unit in Municipality of Cauayan *needs further preparation* for emergencies and disasters as risk index is ≥1.50 (highest risk index of 2.47) followed by Murcia (2.04).

Figure 10. Capacity index, Negros Occidental.

Table 3. Risk analysis on emergency preparedness, Negros Occidental.

Local Health Unit	Hazard	Vulnerability	Capacity	Risk Index
San Carlos City	56.89	27.00	75.23	0.56
D.S. Benedicto	52.59	68.00	41.69	1.45
Calatrava	50.55	26.00	91.35	0.42
Toboso	56.00	58.00	57.91	0.98
Escalante City	56.60	41.00	73.59	0.66
D'BESTCA ILHZ	54.53	41.67	67.95	0.81
Sagay City	57.04	32.00	72.18	0.62
Cadiz City	51.83	33.00	69.58	0.61
Manapla	46.12	49.00	38.44	1.24
CASAMA ILHZ	51.67	38.00	60.07	0.82
Victorias City	56.67	52.00	73.18	0.74
E.B. Magalona	41.90	25.00	52.29	0.64
Silay City	55.53	50.00	78.46	0.67
Talisay City	51.00	31.00	71.03	1.45
Murcia	47.08	79.00	30.52	2.07
North Central ILHZ	50.41	47.40	61.10	0.94
Bago City	58.20	39.00	93.95	0.52
Pulupandan	50.68	41.00	69.85	1.45
Valladolid	45.41	63.00	50.94	1.06
San Enrique	43.42	27.00	69.23	0.51
La Carlota City	53.14	27.00	81.94	0.49
Pontevedra	55.73	50.00	46.64	1.13

Midland ILHZ	51.10	41.17	68.76	0.73
Hinigaran	52.61	22.00	80.79	0.46
La Castellana	55.29	56.00	79.01	0.70
Moises Padilla	47.91	57.00	57.36	0.91
Isabela	46.12	39.00	79.91	0.53
Binalbagan	55.34	32.00	66.85	0.65
Himamaylan City	56.89	72.00	96.27	0.67
South Central ILHZ	52.36	46.33	76.70	0.66
Kabankalan City	58.65	70.00	72.45	0.89
Ilog	56.06	39.00	53.90	0.88
Cauayan	59.36	72.00	27.25	2.41
Candoni	48.27	28.00	61.40	0.62
Sipalay City	57.94	85.00	54.51	1.31
Hinobaan	63.68	74.00	91.38	0.75
South Negros ILHZ	57.33	61.33	60.15	1.14
Negros Occidental	53.05	47.23	66.42	0.85

Seven local health units in the province are *poorly prepared* for emergencies and disasters (indices of risk between 1.00 – 1.49) as also shown in Table 3. Majority of the local health units (19 out of 31) in Negros Occidental are *satisfactorily prepared* with indices of risk between 0.50-0.99. Municipality of Calatrava in the north, La Carlota City in the midland and Hinigaran health unit in the south are *very prepared* (<0.49).

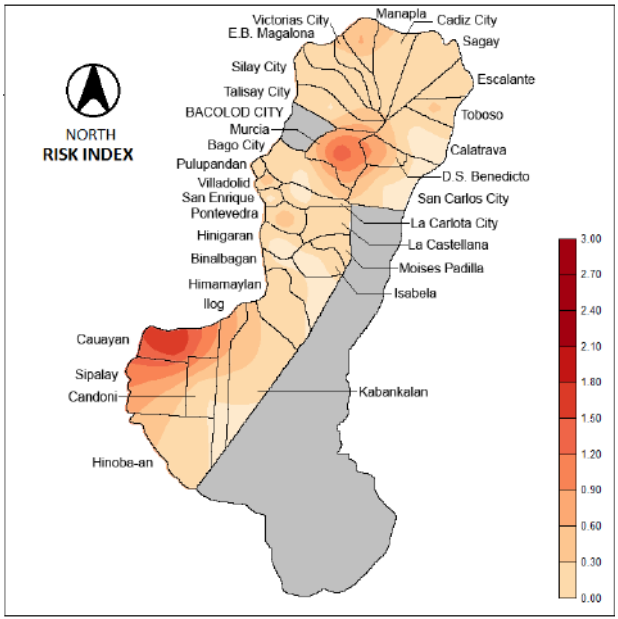


Figure 11 shows the risk analysis through Risk index map where intense color signifies higher risk indices concentrated mostly in the central and southern areas of the province.

Figure 11. Risk index, Province of Negros Occidental.

DISCUSSION

Hazard and Vulnerability identifies and defines a Risk. Capacity is preparedness itself and this follows that it had been a risk modifier to reduce risks involved in health emergencies and disasters. Higher capacity scores as shown in the Table 3 would decrease the health risk as determined through a Risk Index. Thus, lower index of risk would imply higher extent of emergency preparedness particularly for the Calatrava, La Carlota City and Hinigaran local health units.

Those seven local health units that are *poorly prepared* indicate that even there had been capacity development being implemented to respective local health units, it cannot properly address the possible impact of increased hazards and vulnerabilities. *Satisfactory preparation* among the majority of the local health units reflects that there are capacities development handled by health emergency managers but these are somewhat agreeable in addressing health risks involved in emergencies and disasters.

CONCLUSION

Analyzing risk taking into account the relationship of hazards, vulnerabilities and capacities had projected how local health units are prepared for possible emergencies and disasters. The study showed that higher capacity scores would decrease the risk index depending upon the extent of hazards and vulnerabilities. It must be noted that level of implementation of key elements of emergency preparedness is significantly different from one local health unit to the other. As there are municipal/city health units that are very prepared or satisfactorily prepared for possible emergencies and disasters, there are still others who are poorly prepared and will need to be given assistance. The generated risk analysis may not be seen as something positive to some cities and municipalities with higher risk indices. It can be taken, however, as an empirical status report on the level of emergency preparedness for health emergency managers to strengthen on. Among the four health cluster preparations in the province, local health units need to be prepared for the least addressed Mental Health and Psychosocial Support Services (MHPSS) for distressed rescue and relief workers, grieving and bereaved families of victims in possible emergencies and disasters.

RECOMMENDATIONS

It is the recommendation of this study that health emergency managers be recognized in the institutionalized local disaster risk reduction and management council to support local adoption of health emergency policies. Community-based health promotions on emergency preparedness especially in hard-to-reach areas can be initiated by health emergency managers in transforming reactive perceptions to proactive outlook of health risks. All-hazards approach and networking should be strengthened particularly for South Central Inter-local Health Zone as health zoning significantly improve organizational will and can pool resources of respective local health units in mitigating risks efficiently. This can also be of advantage for those local health units who are poorly prepared or needing preparations for emergencies and disasters. Vulnerable communities in the province, on the other hand, should be addressed especially those coastal barangays and far flung elevated terrains.

The role of Provincial Health Office, being the lead health institution in the province, can provide technical assistance to this local health units in implementing Health Emergency Preparedness, Response and Recovery Plans in accordance to actual needs of the community. In order to enhance risk reduction measures through emergency preparedness, it is recommended to properly be communicated and coordinated to other concerned agencies other than health.

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Hand Hygiene Compliance among Health Care Workers at the Emergency Department of University of the Philippines – Philippine General Hospital

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Abstract

Introduction. Hospital-Acquired Infection (HAI) is one of the most preventable causes of patient mortality and hand washing is the single most important strategy to prevent HAIs. Hand washing compliance in the Philippine General Hospital - Emergency Department has not been studied. Therefore assessment of hand hygiene practices must be done.

Objective. The general objective is to determine the baseline hand hygiene compliance among health care workers in the Philippine General Hospital-Emergency Department.

Research Methodology. This is a descriptive study, done through direct observation of opportunities for hand hygiene and compliance (based on the guidelines in the 2009 WHO Hand Hygiene Technical Reference Manual) of doctors, nurses, students and utility staff during routine patient care activities. Knowledge, attitudes and perceptions toward hand hygiene were assessed using a self-report questionnaire. Chi square analysis was used to compare proportions, while logistic regression model was used to determine the association of activity index with hand hygiene compliance.

Results. A total of 838 opportunities was observed for hand hygiene over an accumulated total of 28 hours of observation period. For the staff written survey, a total of 87 accomplished forms were collected. Nurses (95%) have the most knowledge of the hospital hand hygiene protocol and its indications compared to doctors (78%) and students (36%). On self-rating (survey) compliance, doctors (72%) and nurses (78%) are more compliant compared to students (36%). On observation, nurse/nursing assistant/utility workers were 4x more compliant than the students and doctors (OR=3.67; 95% CI: 2.47 – 5.46). Higher compliance was noted in the morning shift with 30% compliance (OR=3.00; 95% CI: 2.03 - 4.45; <0.00001), weekends more than on weekdays (OR=3.46; 95% CI: 2.35 – 5.10; p<0.00001), use of gloves than without it (OR=18.74; 95% CI: 11.71 – 30.13; p<0.00001), and higher compliance was noted after body fluid exposure risk.

Conclusion. Hand hygiene compliance in the PGH Emergency Department is very low (19.5%) but is relatively higher compared to that of PGH Medicine Ward/ICU (10.8%) and PGH OPD (4.7%). Knowledge, attitudes and perceptions toward hand hygiene was significantly different among health care workers.

Keywords**:** Hand hygiene, hand washing, emergency department

Introduction:

Hospital-Acquired Infection (HAI) is one of the most preventable causes leading to patient mortality. Hand hygiene is the single most important strategy to prevent HAIs (Sharma R. et. Al., 2012). The practice of hand hygiene has long been recognized as the most important way to reduce the transmission of infectious agents within a hospital or healthcare setting. Failure to properly comply with simple hand washing practices has been estimated to contribute approximately 50% of all HAIs, which kills about 100,000 people each year in the U.S. and cost hospitals between $4 billion and $29 billion annually ("Hand Hygiene Compliance Monitoring Application Note", 2001).

In PGH, previous studies done at the Medical ward and ICU revealed very low compliance rate of 10.6% among health care workers (Gaboy, A, 2013). A recently concluded study at the PGH Family Medicine Outpatient Clinic (Morales, R, 2014) revealed a much lower 4.7% compliance rate. Hand washing compliance in the PGH ED (Emergency Department) has not been studied. There is a

need to assess hand hygiene practices so that improvement strategies can be implemented.

Methodology:

Study Design. This is a descriptive study, done through direct observation during routine patient care activities and survey through self-report questionnaire.

Study Duration. The observations and surveys were conducted on November 1-31, 2015.

Inclusion and Exclusion Criteria Inclusion criteria were health care workers (doctors, nurses, students, and utility staff) who entered the patient zone; the area included the patient and surfaces or items that are temporarily or exclusively dedicated to him or her. Patients and their watchers were not involved in the study.

Sampling and Population. Observations were done, distributed over a 1-month period at 3 different time shifts: morning (6AM to 2PM), afternoon (2PM to 10PM) and night (10PM to 6AM) for a total of 2 hours per shift. Observations were distributed over weekdays and weekends. Inclusion criteria were health care workers who entered the patient zone; the area included the patient and surfaces or items that are temporarily or exclusively dedicated to him or her. Observations were done discreetly without the knowledge of the subject. Sample size was calculated using the expected correlation coefficient of 0.39 based on similar existing studies. With a level of significance of 5%, margin of error of 0.2, and alpha = 0.1, at least 366 opportunities for hand hygiene were have to be observed to estimate hand hygiene compliance rate

Data Collection. Opportunities for hand hygiene and compliance were assessed based on the guidelines in the 2009 WHO Hand Hygiene Technical Reference Manual. Opportunities for hand hygiene observations were identified. Hand hygiene between contaminated sites to another site in the same patient was considered as an opportunity for hand hygiene. Failure to remove gloves after patient contact or between a contaminated and clean body site on the same patient were considered noncompliance. The main outcome variables were hand hygiene action either by hand washing with soap and water or hand rubbing with an alcohol-based solution. Study variables included professional status (doctor, nurse and student), sex, location, time of the day, day of the week, glove use and activity index or hand hygiene workload (number of opportunities per hour of patient care for each individual).

To assess knowledge, attitudes and perceptions toward hand hygiene, a self-report questionnaire was given to doctors, nurses and students. Survey assessed the following items: (1) knowledge of hospital protocol, (2) perceived and actual knowledge of hand hygiene indications, (3) perceived hand hygiene compliance, (4) perceived factors contributing to non-compliance, (5) motivation and perception of being able to behave as desired, (6) time-related attitude, (7) morality related attitude, and (8) usefulness-related attitude. Knowledge on hand hygiene indication is good if the respondent was able to enumerate at least three of the specified indications by the WHO. Training or lecture on proper hand hygiene, hand hygiene product preference, and suggestions on how to improve hand hygiene campaign were also elicited. Participation was voluntary. Chi square analysis was used to compare proportions, while logistic regression model were used to determine the association of activity index with hand hygiene compliance. The magnitude of association was measured by odds ratio with 95% confidence intervals.

Ethical Considerations.

The study was submitted to UPMREB for ethical approval prior to conduct of the study. Names and other identifying information were not included in the observation and survey forms. Individual hand hygiene performance was not divulged to anyone during and even after the

completion of research. Observations were recorded using codes and tallied in groups (doctors, nurses, students). Informed consent was given to the participating health care workers. Observation sessions did not affect the care and services that the patients receive during the course of the study. There was no conflict of interest.

Results and Discussion:

Observations were solely done by the investigator to prevent bias. The researcher observed a total of 838 opportunities for hand hygiene over an accumulated total of 28 hours period. For the staff written survey, a total of 87 accomplished forms were collected.

Table 1. Knowledge of hand hygiene practices in PGH Emergency Department

Knowledge	Doctors (%)	Nurses/ NA/ Utility (%)	Students (%)	Overall (%)	*p-value*
Hospital hand hygiene protocol	63	97	94	84.7	<0.00001 (S)
Hand hygiene indications	78	95	36	69.7	<0.00001 (S)
5 out of 5	68	92	36	65.3	
3 out of 5	7	4	54	21.7	<0.00001 (S)
1 out of 5	0	0	0	0.0	
0 out of 5	25	4	9	12.7	
Received lecture or training	74	95	81	83.3	<0.01 (S)
Self-rating compliance					
Almost always	72	78	36	62.0	
Half of the time	28	22	54	34.7	<0.00001 (S)
Rarely	0	0	9	3.0	
Disinfectant preference					
Soap and water	72	43	54	56.3	
Alcohol based solution	0	7	0	2.3	<0.0001 (S)
Either	14	50	27	30.3	
Others	14	0	18	10.7	
Reasons for noncompliance					
Too busy	28	14	72	38.0	<0.00001 (S)
Forget	0	7	36	14.3	<0.00001 (S)
Unsure of need	0	0	0	0.0	---
There are more important things to do	14	7	27	16.0	<0.001 (S)
Out of products	85	64	63	70.7	<0.001 (S)
Products not in convenient location	28	0	45	24.3	<0.00001 (S)
Skin irritation	0	7	18	8.3	<0.0001 (S)
Others					
Believes that washing hands means loss of time	7	0	0	2.3	<0.001 (S)
Belies that washing hands saves lives	93	97	100	96.7	0.02 (S)
Feels bad when unable to wash hands sufficiently	71	79	72	74.0	0.37 (NS)
Completely convinced of the usefulness and importance of hand hygiene	100	100	91	97.0	<0.001 (S)
Perform hand hygiene more often if more sinks and alcohol dispensers are available	100	100	100	100.0	1.00 (NS)

Table 1 presents the knowledge, skills and attitudes of hand hygiene practices among doctors, nurses and students in the PGH Emergency Department. Almost all of the nurses and most of the students have knowledge of the hospital hand hygiene protocol. Approximately only two thirds of the doctors answered yes. When asked if they know the indications, 95% of the nurses answered yes compared to that of 78% of doctors and 36% of students. When asked to enumerate the WHO recommended indications for hand hygiene, 92% of the nurses were able to enumerate all 5 indications compared to 68% of doctors and 36% of students. Approximately half of the students were able to answer 3 out of 5 of the indications. One-fourth of the doctors did not answer the list of indications. Most of the respondents acknowledged that they

have received lecture or training regarding proper hand hygiene with 95% of nurses answered yes.

In terms of self-rating compliance, approximately three fourths of the doctors and nurses are almost always compliant compared to only one thirds that of the students. Approximately half of the students were answered half of the time.

For the disinfectant preference, more doctors prefer soap and water (72%), half of the nurses prefer either soap and water versus alcohol based solution. Half of the students also prefer soap and water. A few respondents prefer betadine solution. Doctors fail to comply mostly because of out of products (soap and or alcohol) followed by being too busy and products not in convenient location. For nurses, it is also because of out of products followed by being too busy. Most students reasoned that being too busy made them fail to comply followed by out of products.

A few doctors believe that hand washing means loss of time. All of the students and almost all of the doctors and nurses believe that hand washing saves lives. Approximately three fourths of the respondents feel bad when they are unable to wash hands. All except for a few students were completely convinced of the usefulness and importance of hand hygiene. All of the respondents were positive that they would perform hand hygiene more often if more sinks and alcohol dispensers are available.

Table 2. Distribution of hand hygiene opportunities and factors associated with compliance in the PGH Emergency Department

Variable	Opportunities N (%)	Hand hygiene action	Compliance (%)	Chi square *p* value
Professional status				
Doctor	345	27	7.8	<0.00001 (S)
Nurse/ Nursing assistant/ Utility workers	196	66	33.6	
Student	297	51	17.1	
Sex				
Male	334	51	15.2	0.23 (NS)
Female	504	93	18.4	
Time of day				
morning (6AM - 2PM)	210	64	30	<0.00001 (S)
afternoon (2PM - 10PM)	377	30	7.9	
night (10PM - 6AM)	251	50	19.9	
Day of the week				
Weekdays	544	58	10.4	<0.00001 (S)
Weekends	294	86	29.2	
Use of gloves				
Yes	231	114	49.3	<0.00001 (S)
No	607	30	4.9	
Indication				
Before patient contact	223	0	0	<0.00001 (S)
Before aseptic procedure	97	0	0	
After body fluid exposure	82	72	87.8	
After patient contact	245	56	22.8	
After contact with patient's surroundings	191	16	8.3	

Table 2 shows the distribution of hand hygiene opportunities and factors associated with compliance in the PGH emergency department. The results showed that all the variables listed in the table were significantly associated with compliance except for sex (p=0.23). There was a significant association noted between professional status and compliance as shown by the p value of <0.00001.

Nurse/nursing assistant/utility workers were more compliant than the students and doctors. They were almost 4x more compliant than doctors and students (OR=3.67; 95% CI: 2.47 – 5.46). Between doctors and students, students were 2x more compliant than doctors (OR=2.44; 95% CI: 1.45 - 4.13; p=0.0003). Time of the day was also significantly associated as proven by the p value of <0.00001. Significantly higher compliance was noted in the morning with 30% compliance (OR=3.00; 95% CI: 2.03 - 4.45; <0.00001). Lowest compliance was noted in the afternoon with only 7.9%. At night, almost 20% compliance was noted. A significant association was also noted between days of the week and compliance. There was a 3x higher chance of compliance on weekends than on weekdays (OR=3.46; 95% CI: 2.35 – 5.10; p<0.00001).

Using of gloves was also significantly associated with compliance. There was an almost 19x higher chance of compliance when there is use of gloves than without it (OR=18.74; 95% CI: 11.71 – 30.13; p<0.00001). Moreover, indication was also significantly associated with compliance and higher compliance was noted after body fluid exposure risk. There is 68 times higher compliance noted on this indication compared to others indications (OR=68.40; 95% CI: 32.46 – 148.01; p<0.00001). There was also compliance noted after patient contact with 22.8% and after contact with patient's surrounding with 8.3%.

The actual hand hygiene opportunities and their corresponding compliance as observed in Table 2. Overall hand hygiene compliance is at 19.5%. Based on the results, nurses/ nursing attendants are the most compliant although it is only about a third of the time. Most of these opportunities come from hand washing after body fluid exposure to and after patient contact. Examples of such opportunities include after assisting intubation, after attending to code, after suctioning secretions and after post mortem care. Doctors have the highest number of opportunities but with the lowest compliance rate of 7.8%. Observed compliance (though not all the time) is after intubation, after examining wet or bloody patients, after a code, after insertion of NGT or FC. Students also have a low compliance rate of 17%. The overall compliance rate however is much higher than the compliance rate studies done on the Out Patient Department and Medicine Ward/ICU.

In terms of sex distribution, both are equally poorly compliant (15% male versus 18% female). Looking at compliance between shifts, the morning shift gets the highest compliance rate of 30%, followed by the night shift 19.9%. The afternoon shift where most of influx of patients occurs gets the lowest at 7.9%. With regards to hand washing compliance where the use of gloves is indicated, approximately half of the health care workers are compliant. Comparing it with only 5% compliance rate for opportunities where the use of gloves is indicated but gloves were not used.

In terms of compliance per indication, there was zero compliance for "before patient contact" and "before aseptic procedure". "After exposure to body fluids" got the highest rate of compliance at 87.8%, this is followed by "After patient contact at 22%. "after contact with patients surroundings" received a compliance rate of 8.3%. The overall compliance rate is 19.5%. This is much higher to compared previous studies done at Out Patient Department and Medicine Ward/ICU.

Based on the survey, factors that motivate hand washing include consistent availability of products (soap, water, alcohol) whereas factors that inhibit hand washing include being too busy, products not in convenient location and hand washing before patient contact. This can be observed by the decline in compliance during the afternoon shift where most of the influx of patients thus opportunities are seen.

Conclusion

Hand hygiene compliance in the PGH Emergency Department is very low (19.5%). This however is relatively higher compared to that of Medicine Ward/ICU (10.8%) and OPD (4.7%). The main problem for noncompliance includes lack of hand hygiene products and being too busy. Hand hygiene indications with noncompliance include hand washing before patient contact and hand washing before aseptic procedure. Hand hygiene indication with increased compliance include after body fluid exposure risk. Hand hygiene indications with low compliance include after patient contact and after contact with patient's surroundings. Nurses are the most compliant health care workers to hand hygiene. Knowledge, attitudes and perceptions toward hand hygiene is significantly different among health care workers.

Results of the present study showed that professional status, time of the day, days of the week, use of gloves and indications like after body fluid exposure risk were all significantly associated with hand hygiene compliance.

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COMPLETED RESEARCHES (2016)

VICENTE SOTTE MEMORIAL MEDICAL CENTER (CEBU CITY)
DEPARTMENT OF EMERGENCY MEDICINE

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Chair

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Verna Faelnar-Nielo, MD, FPCEM
Research Coordinator

Case Report

Revelo, Leia, "A Case of Atropine Toxicity"

Cortes, Ralph Niño, "Your Wink Makes Me Blush: A Case of Cavernous Sinus Tumor"

Analytical Researches

Arenajo, Cherry Ann, "Emergency Preparedness: Knowledge and Competency of the Emergency Department In Hospital Emergency Response Team Regarding Mass Casualty Incident Management at VSMMC".

Fronda, Eduardo, "Profile of Trauma Patients in St. Arnold Janssen Trauma Center, VSMMC"

"Out-of-Hospital Cardiac Arrest (OHCA) Registry in Vicente Sotto Memorial Medical Center: The Pan-Asian Resuscitation Outcomes Study (PAROS)"

Miñoza, Ramon Anthony, "Association Between Length of ED Stay on the Mortality Rate and Length of Hospital Stay Among ACS Patients in VSMMC"

Villanueva, Miel Joy, "Profile of Toxicology Cases in VSMMC from January 2014 to December 2014"

"Association Between Length of ED Stay on the Mortality Rate and Length of Hospital Stay Among ACS Patients in VSMMC"

THE MEDICAL CITY
DEPARTMENT OF EMERGENCY MEDICINE

Lourdes Jimenez, MD, FPCEM
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Case Report

Ong, Glorilyn Joyce, "Subclavian Artery Pseudoaneursym Presenting with Dyspnea after a Gunshot Wound: A Case Report," November 28, 2016

Angeles, Joshua Angelo, "A Testicular Time Bomb: An Abdominal Aortic Aneurysm Leak Presenting As Right Testicular Pain: A Case Report" November 28, 2016

TAGUIG-PATEROS DISTRICT HOSPITAL
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Romulo Babasa III, MD, FPCEM — Trainig Officer

Faith Joan Mesa-Gaerlan, MD and Peter Quilala, MD, FPCEM
Research Coordinator

Case Report

Nario, Keith Rollo R. "What Lies Beneath: An Unusual Case of Aortic Dissection Presenting as an Acute Ischemic Stroke" December 2016

Ralota, Kristoffer Ken, "A Case Report on a 43-year old man with known HIV infection presenting to the Emergency Department with Fever and Neurologic Symptoms" December 2016

Anijah-Obi, Godfrey Onuorah, " A Case Report of Pericarditis Presenting as syncope in a Pediatric Patient," December 2016

Analytical Researches

Cruz, Jzan Rose SB, "A Retrospective Study of Oro-tracheal Intubation in an Academic Emergency Department in the Philippines," December 2016.

Bithao, Joanah P. "Utilization of Symptom-Based Point-of-Care Ultrasound at the SLMC-QC Department of Emergency Medicine: One Year Review," December 2016.

Custodio, Debrah Ann Reyes, *"As Assessment of the Clinical Appropriateness of Troponin Testing in the Emergency Department of St. Luke's Medical Center-Quezon City, June 2016,"* December 2016.

Olivera, Janna Elyza P. "Compliance on Emergency Department Clinical Pathways of St. Luke's Medical Center, Quezon City," December 2016.

Angeles, Maria Cristina P. "Survival Rate and Outcomes of Out-of-Hospital Cardiac Arrest at St. Luke's Medical Center," December 2016.

Garcia, Merichelle M. and Babasa, Romulo B. "72-hour unscheduled return visit to the Emergency Room of St. Luke's Medical Center – Quezon City: A Prospective Study," December 2016.

Panganiban, Gretchen Gayle and Gaerlan, Faith Joan M. *"A Field Research Study on the Knowledge, Skills and Practices on Emergency Health Preparedness Among Community health Workers (CHWs) of Typhoon-Yolanda Affected Communities in Guiuan, Eastern Samar," December 2016*

SOUTHERN PHILIPPINES MEDICAL CENTER (DAVAO CITY)
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Case Report

Deliso, Enrico Ian and Convocar, Paulene, "An Inner Surprise: A Case Of Duodenal Injury Following Blunt Abdominal Trauma," December 2016

Fernandez, John Christian, "Refractory Hypotension In A 66 Year Old Woman Due To Left Ventricular Compression By A Mediastinal Mass - A Diagnostic Dillema," December 2016.

Hega, John Michael "Not Just An Ordinary Birthmark- A 6-Year Old Child With Sturge-Weber Syndrome: A Case Report," December 2016.

Salvador, Arthur**,** "Tempestad Tocar: Thyroid Storm with EMA Syndrome: a Case Report," December 2016

Taya, Hanna Mia Monica, Mesa-Gaerlan, Faith Joan, Dimagiba, Richard Vincent, "As The Dust Settles: A Case Report Of An Emergency Department's Response To The Roxas Night Market Bombing Mass Casualty Incident," December 2016

Villanueva, Margaux Regine and Tejero-Gahol, Pat Namnama, "Shake, Rattle and Roll: A Case Report on Pineal Gland Mass In a Fourteen-Year Old," December 2016.

MAKATI MEDICAL CENTER
DEPARTMENT OF EMERGENCY MEDICINE

Gabriel Gabriel, MD
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Case Report

Buquid, Michel A., "A Clinical Case of Cardiogenic Shock in a 3-month old Baby Boy, " November, 2016

Cordova, Reed Aaron A., "Cardiac Tamponade In A Ruptured Right Coronary Artery – A Case Study"

Custodio, Hazel Angeli D., "Crushed Cord, Crushed Dreams: Complete Spinal Cord Injury after a Zip-line Ride - A Case Report," November 2016.

Del Rosario, Kristel Marie D. "A Case of Post-Coital Posterior Fornix Laceration," November 2016

Macogay, Arthur L. III, "ST- Depression In The Setting Of Anaphylaxis To Chocolate And Amoxicillin: A Case Report Of Kounis Syndrome,"

Roy, James Maximillain V., "A Clinical Case of Sigmoid Volvulus"

Analytical Researches

Austria, Joan Lizzet S., "Collaboration Between Emergency Medicine Residents and ER Nurses In the Emergency Department of Makati Medical Center," November 2016.

Saballa, Marianne C., "International Multi-Center Controlled Interventional Trial to Increase Out-of-Hospital Cardiac Arrest Survival by Implementation of a Dispatcher-Assisted Cardio- Pulmonary Resuscitation Package (Pan-Asian Resuscitation Outcome Study Phase 2): Makati Medical Center Sub-Analysis," October 2016.

Pioquinto, Fatima S., **"**Occurrence of Physician and Nurse Disruptive Behaviors in the Emergency Department of the Makati Medical Center, November 2016.

Modina, Kathleen Ann, **"**Antibiotic Prescribing Rates for Adult Patients with Upper Respiratory Tract Infection in the Emergency Department, Makati Medical Center from Jun 2012 to Sept 2012, January 2016.

Modina, Kathleen Ann, "Compassion Fatigue Among Physicians and Nurses in the Emergency Department, Makati Medical Center", January 2016 – ***1st Place 2016 PCEM Annual Research Paper Presentation***

Santos, Aaron Amos C., "Comparison of Self-Perceived, Estimated, Actual and Ideal Weight in Ambulatory Adult Patient in Emergency Department in MMC: A Prospective Study, January 2016

Po, Therese Jane B., "The Perspective on Night Shifts of Emergency Medicine Residents of Makati Medical Center: A Survey December 2015, January 2016.

Martinez, Ranvier T. "Identification of Factors and Areas of Delay Influencing Makati Medical Center Emergency Department Patient Flow and Crowding," December 2016.

Pangwi, Diogenes Santino B. "Factors Influencing Non-Urgent Adult Patients to Seek Consult at the Emergency Department: A Prospective Study on January 2016 at Makati Medical Comparative Study of Anti-Emetic Property of Intravenous Diphenhydramine and Intravenous Ondansetron in Adult Patient with Persistent Vomiting even after Intravenous Metoclopramide

Dela Cruz, Marlon B. "Point of Care Creatinine Versus Serum Creatinine in Determining Patient at Risk of Developing Contrast Induced Nephropathy (CIN) among Stroke Patients, Renal Adjustment for Drug Administration among Acute Coronary Syndrome and Septic Patients - A Prospective Study." March 2016.

Moderes, Vincent G., "A Descriptive Study on the Clinical Profile of Chikungunya Infection in Children at Makati Medical Center," December 2016.

Moderes, Vincent G., "A Descriptive Study to Determine the Relationship of Patients with elevated Body Mass Index," December 2016

Santos, Aaron Amos C., "Validation of Heart Score in Patient Presented with Chest Pain ACS in MMC Emergency Department: A Retrospective Study," January 2016.

Kristine T. Traquena, "The Compliance Rate of Emergency Department Personnel and Barriers in Timely Administration of Antibiotic in Patients with Severe Sepsis or Septic Shock: A Comparative Study of Anti-Emetic Property of Intravenous Diphenhydramine and Intravenous Ondansetron in Adult Patient with Persistent Vomiting even after Intravenous Metoclopramide Prospective Observational Study," February 2016.

Nomorosa, Rodineil, "Comparative Study of Anti-Emetic Property of Intravenous Diphenhydramine and Intravenous Ondansetron in Adult Patient with Persistent Vomiting even after Intravenous Metoclopramide," March 2016.

DEPARTMENT OF EMERGENCY MEDICINE
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Case Report

Manalo, Christopher, "Esophageal obstruction from a metamphetamine packet and its succesful endoscopic extraction."
Presented as Poster presentation in th PGH Residents' Research Forum, Philippine General Hospital, November 2016

Dumaguit, Lousyl Mae, "Centipede: Envenomation: A Case Report"

Lactupo, Joy Regina, "*Rhabdomyolysis in A Methamphetamine Toxicity: A Case Report"*

Analytical Papers

Cruz, Marjorie and Gaerlan, Faith Joan, "Knowledge, Attitudes and Practices of the Emergency Room Personnel Regarding Disaster Planning and Preparedness at Baguio General Hospital and Medical Center" ***Oral Presentation in the 4th EMS Asia Conference in Seoul, South Korea, 24 Aug 2016***

Belarmino, Fred and Gaerlan, Faith Joan, "Hand Hygiene Compliance among Health Care Workers at the Emergency Department of University of the Philippines – Philippine General Hospital"

Morales, Jordan Ysabel and Llaneta, April, "Survey on the Clinical Preventive Services in the Emergency Departments of Philippine Hospitals within Metro Manila"

International Presentation:

Gabriel, Joy, Gaerlan, Faith Joan and Llaneta, April, "Factors Affecting Transfer And Referral Of Trauma Patients From Cavite-Based Hospitals To The Philippine General Hospital Emergency Department" **Presented as Poster in the 4th EMS Asia Conference in Seoul, South Korea, August 2016**

PASIG CITY GENERAL HOSPITAL
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Case Reports

***Agaid-Dalutag, Ethel Joy E*.** "Thyroid Storm Presenting As Abdominal Pain And Normothermia," December 2016

Bacalangco,, Jefferson L. "Hypotension In A Patient With Marfan's Syndrome: A Case Report," December 2016

***Cruz, Marison Faith V*.** "Adenocarcinoma Of The Colon In Adolescents," December 2016

Mendoza, Michelle L. "The Mistaken Identity: A Case Of Acute Appendicitis In A Pregnant Woman," Dcember 2016

Falconitin, Tomas Marion M. "The Longinus Spear: A Case Of Emergency Bilateral Thoracentesis In A Patient With Pleural Effusion," December 2016

San Marcos, Bernard John, "Switch In Fate: A Case Of Non-ST Levation Myocardial Infarction With Heart Failure In A Young Male Complicated By Situs Inversus Totalis," December 2016

Singlao, Sheina I. "Second Chance: A Case Report Of Brugada Syndrome In A 23 Year Old Male," December 2016.

Analytical Papers

Boragay, Amor B. Jr. "Validation Of Australasian Triage Scale As Triaging System In Acute And Emergency Department Of Pasig City General Hospital," December 2016

***Gellegani, Butch Gerald S*.** "Incidence Of Reported Animal Bites And Rabies Exposure In Pasig City General Hospital For The Year 2014-2015," December 2016

***Gellegani, Butch Gerald S*.** "Effects Of Triage Education On Knowledge And Practice Of Emergency Room Staff In A Government Hospital In Pasig City," December 2016

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Analytical Papers

Acosta, Kristine Anne S. "Compliance Of Patients To Anti-Rabies Vaccination In Post-Exposure Prophylaxis At The University Of Perpetual Help Dalta Medical Center From January 2014-December 2014"

Atienza, Stella Marie. "Hospital mortality trend analysis of patients with Non-ST elevation myocardial infarction admitted at the University of Perpetual -Dalta Medical Center for two consecutive years 2013 – 2014.

Galang, "A Retrospective Study on the Neutrophil-Leukocyte ratio and its prediction on Myocardial Infarction mortality"

Miranda, Barbara Marie J. "A Retrospective Study on the Use of Opiates in the Diagnosis of Patients with Acute Appendicitis presenting with Abdominal pain"

Navarro, Mark Leonard*, "*A Retrospective Study on the Average Number of Hours of Patients Waiting for Admission in University of Perpetual Help Dalta Medical Center Emergency Room in the year 2012-2014

Tamayo, Jonathan Scott, "IS FAST FAST ENOUGH? A retrospective study on the time it takes to acquire FAST examination in the UPHDMC ER from 2010-2015," December 2016

Yago, Genevieve F. "Compliance of Emergency Medicine Department Compliance Of Emergency Medicine Department Of University Of Perpetual Help Dalta Medical Center In Lowering Blood Pressure Of Hemorrhagic Stroke Patients From January 2014-December 2014"

MANILA DOCTORS HOSPITAL
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Case Reports

Bermudez, Fae Princess, "A Case Series on Isolated Lead aVR ST-Segment Elevation Clinical Significance and Outcome," December 2016

Evangelista, Dan, "Massive Hemoperitoneum from Ruptures Corpus Luteum Cyst: A Case Report on the Evaluation and Management in the Emergency Department (December 2016)

EAST AVENUE MEDICAL CENTER
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Analytical Papers

Barasi, Ma. Therese Odilla, "Evaluation Of The Strategies Addressing Prolonged Boarding Time And Its Effect On Inpatient Mortality In EAMC-EDTC," December 2016

Brocales, Christina Claire A. "Initial Temperature as a Predictive Factor of Early-Onset Infection in Acute Ischemic Stroke Patients at East Avenue Medical Center Emergency Department: A Prospective Cohort Study," December 2016

Marzan, Ivan Joseph, "Evaluation of Burnout Among Resident Physicians Manning the East Avenue Medical Center Emergency Department" December 2016

Tanguiling, Sheryl Ann G. "Validation of Rapid Emergency Medicine Score (REMS) as a Prognostic Tool for Mortality in Adult Medical Patients in the Emergency Department at East Avenue Medical Center December 2016

DE LA SALLE UNIVERSITY AND MEDICAL CENTER
DEPARTMENT OF EMERGENCY MEDICINE

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Lyndon A. Cosico, MD, FPCEM,
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Analytic Studies:

***Leynes, Hendrick Izar*, "**Knowledge, Attitudes and Practices of Medical Personnel Regarding Disaster Planning and Preparedness at De La Salle University Medical Center"

Kallos-Guinto, Fluerdeliz, "Point Of Care Testing Versus Central Laboratory Testing: An Evaluation Of Result Turn Around Time And Accuracy At The De La Salle University Medical Center Emergency Department"

CORAZON LOCSIN MONTELIBANO MEMORIAL REGIONAL HOSPITAL (Bacolod City) DEPARTMENT OF EMERGENCY MEDICINE

Harry Carial, MD
Chair

Patrick J. Tiglao, MD, FPCEM,
Trainig Officer

Cherie Grace Quingking, MD, FPCEM
Research Coordinator

Torrefranca, Junnie Martin, "Grappling against a Venomous Invader: Severe Envenomation secondary to Snake Bite without Antivenin Therapy, " (November 2016)