UNIVERSITI PUTRA MALAYSIA

EVALUATION OF TRIAGE DECISION MAKING IN RELATION TO EARLY ASSESSMENT AND INTERVENTION OF TRAUMA CASES ATTENDED BY PRE-HOSPITAL CARE PROVIDERS FROM EMERGENCY DEPARTMENT, HOSPITAL KUALA LUMPUR

SHAHRUL AZHAR BIN MOHD AZNAN

EVALUATION OF TRIAGE DECISION MAKING IN RELATION TO EARLY ASSESSMENT AND INTERVENTION OF TRAUMA CASES ATTENDED BY PRE-HOSPITAL CARE PROVIDERS FROM EMERGENCY DEPARTMENT, HOSPITAL KUALA LUMPUR

SHAHRUL AZHAR BIN MOHD AZNAN

A THESIS SUBMITTED TO THE FACULTY OF MEDICINE AND HEALTH SCIENCE, UNIVERSITI PUTRA MALAYSIA AS PARTIAL FULFILLMENT FOR THE DEGREE OF THE BACHELOR OF NURSING UNIVERSITI PUTRA MALAYSIA

2011/2012

EVALUATION OF TRIAGE DECISION MAKING IN RELATION TO EARLY ASSESSMENT AND INTERVENTION OF TRAUMA CASES ATTENDED BY PRE-HOSPITAL CARE PROVIDERS FROM EMERGENCY DEPARTMENT, HOSPITAL KUALA LUMPUR

ABSTRACT

Introduction: Pre-hospital care service in Malaysia is still relatively new and it is slowly developing after introduced the Emergency Medicine program. However there is no clear instruction regarding pre-hospital care (PHC) service in Malaysia. With increasing numbers of road traffic accidents and other emergency situations the demand from public requires the best pre-hospital care services. Death and disability due to injury or trauma is top 10 causes of death in low and middle income countries, and 90% road traffic accidents contributed to the major cause of death. Trauma cases need rapid assessment and intervention as the mortality and morbidity incidence depend on pre-hospital care service provided. **Objective:** The general objective is to evaluate the omission in records, in early assessment, and correctness of intervention practice in trauma cases responded by pre-hospital care providers of the Emergency Department, Hospital Kuala Lumpur (EDHKL). **Methods:** This cross sectional study used secondary data which were retrieved from patient records at Emergency Department, Hospital Kuala Lumpur (EDHKL). All trauma cases, which fulfilled the inclusion criteria, and responded by pre-hospital care EDHKL during 1 Jan 2011 until 31 December 2011 were considered, and random sampling was done. A data collection instrument proforma was designed to collect data from the standard sheet used by the pre-hospital care provider at EDHKL. The standard sheet includes, section A: Team leader, respond time and trauma type, section B: Assessment, Section C: Intervention, section D triage, and Section E: physician's report. The calculated sample size was 432 records. Using the "Statistic Package for Social Science (SPSS®)" version 17, descriptive analysis yielded the required frequencies, percentage and standard deviations. Chi-square test and Kappa test were used to determine relationship between dependant variable and independent variable. P value ≤ 0.05 was considered as statistically significant. **Result:** A total of 428 pre-hospital records were obtained and relevant data recorded into standardized proforma. Two hundred and three (47%) cases ware attended by AMO as team leader and 225 (53%) cases were lead by SN. Their working experience were; 1-5 years (34%), 6-10 years (40%) and 11-15 years (26%). There were omissions found in patient assessment; 4 (2%) was due to consciousness level, 14 (7%) airway, 62 (33%) speech quality and 111(58%) in GCS assessment. A total of 251 patients had PHC "inadequacies" in term of intervention. These comprised 24 cases (10%) cases related to airway, 22 (9%) in breathing, 38 (15%) in circulation, 81 (32%) in immobilization and 86 (34%) in haemorrhage control intervention. Based upon physicians' decision, PHC providers achieved 98.3% correctness in green triage (non-critical), 91.6% yellow triage (semi-critical) and 78.9% in red triage (critical) decision. There was significant relationship between GCS assessment and triage decision ($p \leq 0.01$) **Conclusion:** These results can be used by the organization (EDHKL) and other emergency or PHC service providers, to improve the quality PHC services. It is critical to improve efficiencies among PHC providers, to ensure better outcome of relevant trauma cases.

Keyword: HKL, trauma, early assessment, intervention assessment, triage decision making

PENILAIAN TERHADAP MEMBUAT KEPUTUSAN TRIAGE SERTA HUBUNGKAIT DENGAN PENILAIAN DAN RAWATAN AWAL KES-KES TRAUMA YANG DILAKUKAN OLEH KAKITANGAN PRA-HOSPITAL DARIPADA JABATAN KECEMASAN, HOSPITAL KUALA LUMPUR

ABSTRAK

Latar belakang: Pra-hospital perkhidmatan penjagaan di Malaysia masih agak baru dan ia perlahan-lahan membangun setelah program perubatan kecemasan diperkenalkan. Walau bagaimanapun, tiada arahan yang jelas mengenai perkhidmatan pra-hospital (PHC) di Malaysia. Dengan peningkatan angka kemalangan jalan raya dan lain-lain situasi kecemasan masyarakat memerlukan penjagaan yang terbaik perkhidmatan pra-hospital. Kematian dan hilang upaya akibat kecederaan atau trauma adalah 10 punca kematian di negara-negara berpendapatan rendah dan sederhana, dan 90% kemalangan jalan raya menyumbang kepada penyebab utama kematian. Kes-kes trauma memerlukan penilaian dan rawatan segera dimana kadar kematian dan kecacatan bergantung kepada perkhidmatan pra-hospital. **Objektif:** Kajian ini bertujuan untuk menilain kekurangan laporan pra-hospital dan rawatan yang dilakukan oleh kakitangan pra-hospital Hospital Kuala Lumpur, semasa mengandalikan kes-kes trauma. **Kaedah:** Kajian keratan rentas ini menggunakan data sekunder yang telah diambil dari rekod-rekod pesakit di Jabatan Kecemasan, Hospital Kuala Lumpur (EDHKL). Semua kes-kes trauma, yang memenuhi kriteria kajian, dan dilakukan oleh pasukan pra-hospital EDHKL pada 1 Jan 2011 sehingga 31 Disember 2011 dipertimbangkan dan persampelan rawak dilakukan. Proforma telah direka dan disediakan terlebuhdahulu bagi memudahkan kerja-kerja penganpulan data berdasarkan piawaian borang asal yang telah digunakan oleh PHC di EDHKL.perfoma ini terdiri daripada, seksyen A: latar belakang PHC, masa tindakan dan jenis trauma, seksyen B: Penilaian, Bahagian C: Rawatan, seksyen D: triage, dan Seksyen E: laporan pegawai perubatan. Jumlah sampel adalah 432 rekod. Menggunakan "Pakej Statistik untuk Sains Sosial (SPSS ®)" versi 17, analisis deskriptif menghasilkan frekuensi yang dikehendaki, peratusan dan sisihan piawai. 'Chi-square' dan ujian Kappa telah digunakan untuk menentukan hubungan di antara pembolehubah bersandar dan pembolehubah bebas. Nilai $P \leq 0,05$ dianggap sebagai statistik yang signifikan. **Keputusan:** Sejumlah 428 rekod pra-hospital telah diperolehi dan data yang sesuai direkodkan ke dalam proforma. Dua ratus tiga (47%) kes telah dilakukan oleh AMO sebagai ketua pasukan dan 225 (53%) kes adalah diketuai oleh SN. Pengalaman kerja mereka; 1-5 tahun (34%), 6-10 tahun (40%) dan 11-15 tahun (26%). Terdapat maklumat yang tidak lengkap didapati dalam penilaian pesakit; 4 (2%) adalah disebabkan oleh tahap kesedaran, 14 (7%) saluran udara, 62 (33%) kualiti pertuturan dan 111 (58%) dalam penilaian GCS. Sebanyak 251 pesakit menerima "kekurangan" dalam rawatan yang diberikan oleh PHC. Ini termasuklah 24 (10%) kes-kes yang berkaitan dengan saluran pernafasan, 22 (9%) bentuk pernafasan, 38 (15%) edaran darah, 81 (32%) 'immobolise' dan 86 (34%) dalam kawalan pendarahan. Berdasarkan keputusan pegawai perubatan, PHC mencapai 98.3% ketepatan dalam triage hijau (bukan kritikal), 91.6% triage kuning (separa kritikal) dan 78.9% dalam triage merah (kritikal). Terdapat hubungan yang signifikan di antara penilaian GCS dan keputusan triage ($p \leq 0.01$) **Kesimpulan:** Keputusan ini boleh digunakan oleh Jabatan Kecemasan Hospital Kuala Lumpur dan jabatan kecemasan yang lain dalam meningkatkan perkhidmatan pra-hospital. Adalah penting untuk meningkatkan kecekapan kakitangan PHC dalam memastikan hasil yang lebih baik dalam mengandalikan kes-kes trauma.

Kata kunci: HKL, trauma, penilaian awal, penilaian rawatan, keputusan membuat triage

Acknowledgement

In the name Allah, the most gracious and most merciful. I would like say 'alhamdulillah' toward Allah S.W.T for giving me strength to complete my research project titled **Evaluation Of The Early Assessment And Intervention Among Pre-Hospital Care Providers In Trauma Cases From Emergency Department Hospital Kuala Lumpur.** Besides that, I also would like to address my boundless gratefulness to those who had helped me, **Prof Dr. Syed Tajuddin Syed Hassan** as supervisor. Thank are also extended my co-supervisor **Dr. Norfadhlina Zakaria** for guidance and motivation throughout the entire project planning, execution, analysis, write-up and grammar checking. Without of their support and supervision, I just might not make it through all the difficulties.

I also would like to thank The Director of Hospital Kuala Lumpur, Head of Department of Emergency, Emergency Physician and all the staff in ED who help me directly and indirectly. I also want to express special thanks to all my friends and family who always give me positive support to conclude my project. Only Allah S.W.T can repay your good deeds. I will never forget all of you until the end.

Last but not least to all, thank you for everything and sorry for anything. May Allah S.W.T always bless all of us.

TABLE OFCONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATION

≤	Less than or equal
≥	More than or equal
%	Percentage
H_A	Hypothesis
PHC	Pre-hospital Care
ED	Emergency Department
HKL	Hospital Kuala Lumpur
EDHKL	Emergency Department Hospital Kuala Lumpur
AMO	Assistant Medical Officer
SN	Staff Nurse
MVA	Motor Vehicle Accident
GCS	Glasgow Coma Scale
PHATLS	Pre-hospital Advance Trauma Life Support
BTLS	Basic Trauma Life Support
LMA	Laryngeal Mask Airway
MOH	Ministry of Health

CHAPTER 1

INTRODUCTION

Kuala Lumpur Hospital or HKL (Hospital Kuala Lumpur) is located in the centre of Kuala Lumpur within 150 acres of prime land, and easily accessible by public transport within the Klang Valley. HKL is a large government hospital under Ministry of Health of Malaysia with 49 different departments and units, 83 wards and more than available 2000 beds. The services include administration & finance departments, the pharmaceutical department, training and research department, 27 clinical departments and 12 clinical support services.

Pre-hospital care (PHC) service in Malaysia is still relatively new. However, it has been slowly developing since introduced Emergency Medicine Physician program. Due to increasing numbers of the road traffic accidents and other emergency situations, the demand from public requires the best pre-hospital care services; thus health care providers should improve their services. (Hisamuddin et al., 2007).

Previously, all emergency cases in urban Kuala Lumpur were handled by outsider ambulance services like Malaysian Red Crescent, St John Ambulance, Malaysian Civil Defence and other private and NGO organizations. At present, pre-hospital care in HKL is run by the Emergency Department (ED) staffs since 2008 after the Malaysian government introduced the Malaysian Emergency Respond System

(MERS) 999 project. The Assistant Medical Officer (AMO) or Staff Nurse (SN) usually lead the team and will be assist by a health attendant and a non-medical driver.

1.1 Problem Statement

With increasing number of trauma cases in Malaysia, a better pre-hospital care service is of paramount importance. Mortality and morbidity rates can be reduced by providing excellent pre-hospital care services (Mathew, 2001). Lockey (2001) reported that trauma cases need rapid assessment and intervention as the mortality and morbidity incidence depend on pre-hospital care service provider.

PHC providers should maintain and improve their services includes documentation. A study has reported that there was omissions occur in PHC service during the primary evaluation of the case and failure to complete in documentation among PHC providers becomes an issue (Laudrmilch et al., 2010).

A study done by Rottman et al., (1997) reported that 15% of chest pain patients received improper treatment. Records showed existence of wrong assessment, intervention and incomplete documentation (Rottman et al., 1997). In addition, Evaluation of pre-hospital management studies done in Victoria, Australia, reported 77% of crush injury victim received inadequate treatment from pre-hospital care provider.

At present, no studies have been published regarding early assessment and intervention among pre-hospital care providers in Malaysia. Thus, embarks on this study to evaluate any omission in early assessment and inadequacies of intervention done by pre-hospital care providers from the Emergency Department, Hospital Kuala Lumpur.

1.2 Benefit of Study

Pre-hospital care training was designed for those involved in pre-hospital care services. However there is no any clear guidelines regarding pre-hospital care in Malaysia (Ministry of Health (MOH), Malaysia, 2007). This study is done to evaluate early assessment and intervention in trauma cases done by the pre-hospital care providers. The benefit of this study is to rate the ability of the pre-hospital care providers to assess and intervene the trauma cases they attended. The findings from this study can be used to improve pre-hospital care services in EDHKL. Since there is no standardized guideline for pre-hospital care providers in Malaysia, results of this study can enlighten the status of the pre-hospital care service in MOH Malaysia and subsequently helps in designing a more specialised training course for pre-hospital care providers.

1.3 General Objective:

The general objective is to evaluate the omission in early assessment and correctness of intervention in trauma cases responded by pre-hospital care providers of the Emergency Department, Hospital Kuala Lumpur (EDHKL).

1.4 Specific Objective:

1.4.1 To determine pre-hospital care providers professional status.

1.4.2 To determine percentage of omission in assessment documentation.

1.4.3 To determine percentage of inadequacies in intervention practice among pre-hospital care providers.

1.4.4 To determine percentage of correctness in triage decision as confirmed by medical reports.

1.4.5 To determine relationship between working experiences with triage decision evaluation.

1.4.6 To determine relationship between Glasgow Coma Scale (GCS) assessment and triage decision evaluation.

1.5 Research Hypotheses

1.5.1 H_A^1 – There are omissions of assessment in trauma cases.

1.5.2 H_A^2 – There are inadequacies of intervention in trauma cases.

1.5.2 H_A^3 – There is a significant relationship between working experiences with triage decision evaluation.

1.5.3 H_A^4 – There is a significant relationship between Glasgow Coma Scale GCS assessment and triage decision evaluation.

1.6 Conceptual Framework

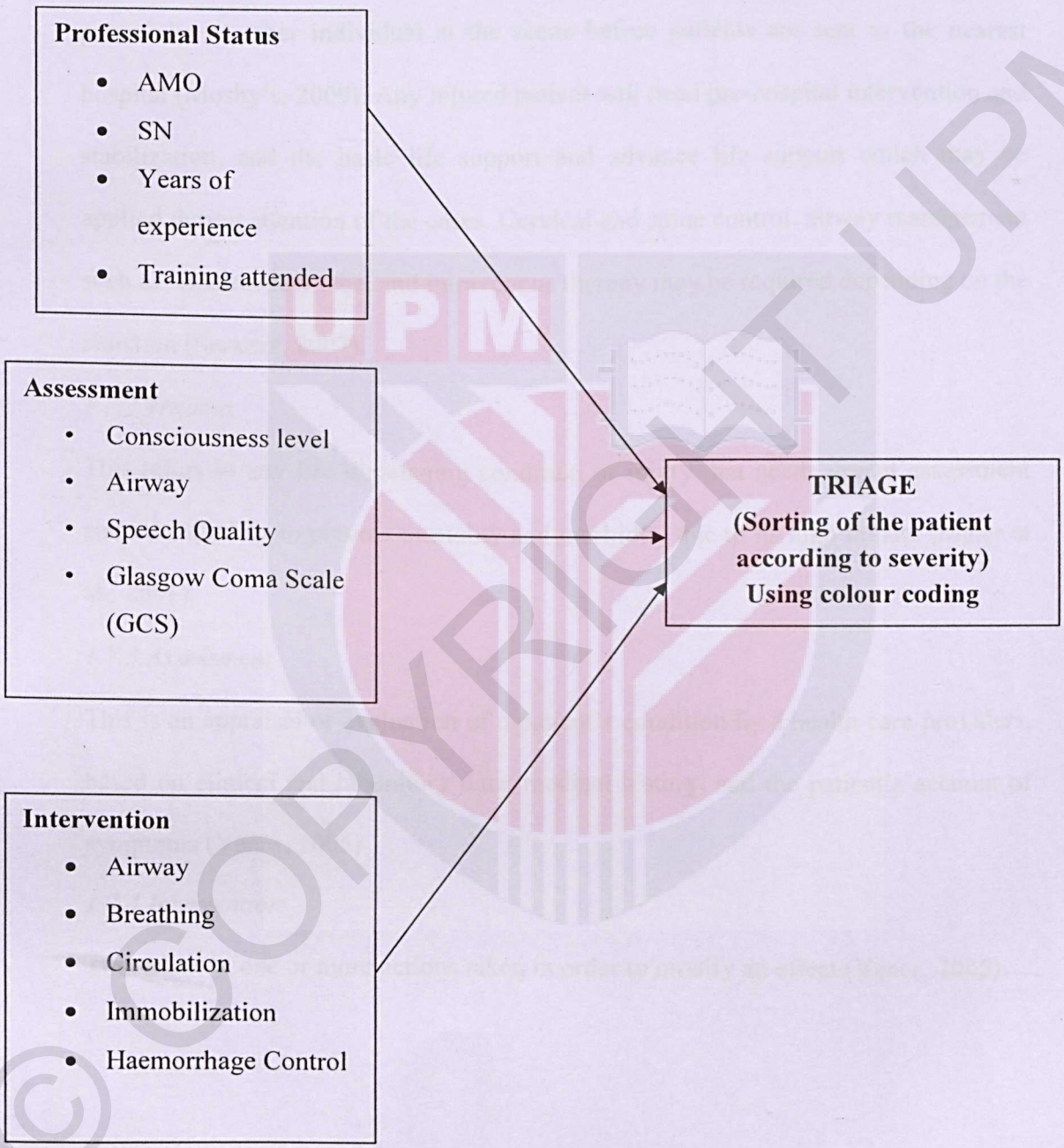


Figure 1 Conceptual framework of PHC assessment and intervention outcome.

1.7 Definition of Term

1.7.1 Pre-hospital Care

Pre-hospital care means an early assessment and medical care provided by the paramedic or other individual at the scene before patients are sent to the nearest hospital (Mosby's, 2009). Any injured patient will need pre-hospital intervention and stabilization, and the basic life support and advance life support which may be applied during attention of the cases. Cervical and spine control, airway management such as endotracheal tube, and intravenous therapy may be required depending on the situation (Senders, 2007).

1.7.2 Trauma

This refers to any life threatening condition or injury that needs urgent assessment and intervention, to prevent mortality and morbidity due to its high impact (Maier et al., 2001).

1.7.3 Assessment

This is an appraisal or evaluation of a patient's condition by a health care providers, based on clinical and laboratory data, medical history, and the patient's account of symptoms (Venes, 2005)

1.7.4 Intervention

This refers to one or more actions taken in order to modify an effect (Venes, 2005).

1.7.4 Triage

This is a system of classification of the patient according to the severity and medical need (Camp & Yates, 2001).

The word triage comes from the French word *trier,* which means to sort (Mauger & Deakin 2001).

1.7.5 Omission

This refers to any incomplete of documentation in patient data sheet. It will measure based on documentation done by PHC either they complete or incomplete of the documentation.

1.7.6 Inadequacies

This refers to any unrelated or inappropriate intervention according to the patient condition and complaint.

CHAPTER 2

LITERATURE REVIEW

2.1 Trauma Prevalence

Mathew (2001) reported that the best trauma outcome depends on pre-hospital care services provider. Trauma is not just limited to motor vehicle accident (MVA), but includes industrial and, domestic accidents, and other mishaps. By the year 1998, mortality due to injury was reported about 97 / 100 000 of the population and MVA is the highest number of cases (Mathew 2001). Trauma and injury had become one of the killers in developed countries and especially developing countries (Maier, 2001). Death among children and teenagers due to road accident is the second highest cause of death (Bavonratanavech, 2003). Death and disability due to injury or trauma is among the top 10 cause of death in low and middle income countries and 90% of road traffic accident was contributed to the cause of death (Sethi et al., 2007). Most of the studies revealed that the trend in trauma incidence is increasing.

2.2 Pre-hospital Care

Pre-hospital care involves early assessment and medical care provided by the paramedics or other trained individuals at scene before sending patient to the nearest hospital (Mosby's, 2009). Pre-hospital care service is a system that is designed to facilitate an efficient and better emergency medicine. The quality of the pre-hospital care can be evaluated by several methods. Guppy & Wollard (2000) investigated the whole of the progression of pre-hospital care as it is a key to measure the efficiency of the service. Pre-hospital care becomes critical in determining the best patient

outcome. An initial assessment and treatment among pre-hospital care practice may reduce mortality and morbidity. Lockey (2001) said that trauma cases need correct rapid assessment and intervention, and the mortality and morbidity incidence depends on pre-hospital care services provider. The ability to assess and treat rapidly is crucial and called the "golden hour" (Hamzah et al., 2005). Delay in managing cardio pulmonary resuscitation is one example of an event or decision that will contribute to the increasing mortality and morbidity rate of up to 7% to 10% (Hamzah et al., 2005).

2.3 Pre-hospital Care Services Status

Tanigawa & Tanaka, (2006) reported that in 1933 the Japan pre-hospital care transportation service was started in Yokohama. Other cities like Tokyo and Aichi were also provided with the same service before World War II. Pre-hospital care in Singapore operated since 1960. During that year there were just two ambulances available. All emergency calls will be attended by a registered nurse, a health attendant and a driver as a team and this was a 24-hour service (Lateef, 2005). In Thailand, 98 government hospitals had launched and established their pre-hospital care services since 2001 (Bavonratanavech, 2003).

In Malaysia, pre-hospital care services were started after introduced Emergency Medicine Physician program and continually expanded slowly. Since there are an increasing number of accidents, demand from the public of pre-hospital care services are also increasing, hence service improvement is essential (Hisamuddin et al. 2006). With "Vision 2020", Malaysia aspires to be a developing country within 9 years

from now. To achieve this target, MOH was granted with a general hospital in every one of the 15 states including teaching hospitals and private hospitals. Health care providers are also required to expand their health services (Hisamuddin et al., 2006). In Malaysia scenario, there is no any clear guideline on PHC services especially in government hospital. At certain places the PHC services underdone by NGOs' included Malaysian Red Crescent, St John Ambulance and Malaysian Civil Defence. However, this NGOs' not received the proper training in PHC services (Ministry of Health (MOH), Malaysia, 2007).

2.4 Pre-hospital Care Service in Hospital Kuala Lumpur (HKL)

Pre-hospital care in Hospital Kuala Lumpur commenced operation in 1998. This service begun after the introduction of the Malaysian Emergency Respond System (MERS) 999 project. Pre-hospital care in HKL is provided by an Assistant Medical Officer (AMO) or Staff Nurse (SN), one health attendant and one non-medical driver from the Emergency Department. This is a 24-hour service in a continuous 7 and 10-hour, 3 shifts working system.

2.5 Training for Pre-hospital Care Provider

At present, pre-hospital care in HKL is led by the AMO or SN as the team leader. The team leader will be supported by one health attendant and a non – medical driver. A training program for the AMO and SN was provided by the Ministry of Health (MOH). The training is a 3-years course for a diploma level certification. However, the training is not fully focused on the pre-hospital care alone. The

training program for AMO include medical, surgical, orthopaedic, emergency & pre-hospital care, obstetrics & gynaecology and other clinical area posting. Every clinical posting during the training program is around 2 – 4 weeks period. The SN was trained in nursing field and this training is more focused on patient care. After completing the training, each of them will be registered to the respective board membership under MOH.

Since, due to no special position in PHC provider like paramedic in Malaysia, usually the AMO and SN from Emergency Department (ED) are responsible for running the pre-hospital care service in Malaysia. All of the AMO and SN are allowed to receive sub specialties training to enhance knowledge and skills such as in Advance Emergency Medical Trauma Care. This is a six-month intensive course, which is converge is more to emergency and trauma care and further exposure to the pre-hospital care services. According to the Ministry of Health, Malaysia., (2007) the pre-hospital care instruction in Malaysia is not clear about the operation. Currently, pre-hospital care service is a subspecialty in ED. This service is run by the ED staffs especially those who had an appropriate qualification in several courses like Basic Life Support (BLS), Advance Life Support (ALS) and other courses related to emergency care (Ministry of Health, Malaysia, 2007). In Malaysia, there is no standard requirement for staff to be assigned as a pre-hospital care provider; therefore the standard requirement for this designation depends on the arrangement of the particular organization or institution itself. Thus, it can involve a physician, a nurse and an AMO as a team in pre-hospital care (Hisamuddin et al., 2006).

2.6 Assessment and Intervention of Patient in Trauma Cases.

A pre-hospital care provider is required to work out of hospital setting. Any emergency call from the public must be alerted by a pre-hospital care provider. Hence all pre-hospital care providers should be able to do the assessment to patient immediately and apply an appropriate intervention. Pre-hospital care providers are also required to apply the advance care if necessary. In certain situation, resuscitation and stability of patient at scene will give benefit to patient (Smith & Conn, 2009). Every assessment and intervention should be documented properly. However, not all pre-hospital care providers are able to give maximum service while managing the cases. A study reported that 15% of chest pain patients received improper treatment as records showed existence of wrong assessment, intervention and incomplete documentation (Rottman et al, 1997). There were also failures to fill up of document among pre-hospital care (Laudrmilch et al., 2010). Evaluation of pre-hospital management studies done in Victoria, Australia, reported that 77% of crush injury victim received inadequate treatment from pre-hospital care provider. From that percentage, 67% or 135 cases contribute to the mortality rate. According to this study too, several factors were mentioned to contribute deficiencies in pre-hospital care management included system inadequacy, management strategy, and inappropriate technique, miss and delay in diagnosis (McDermott et al., 2005).

2.7 Airway, Breathing, Circulation and Disability (A-B-C-D) Assessment & Intervention

Pre-hospital care's scope in trauma cases includes airway and breathing management, bleeding control, and immobilization of cervical and spinal also

splinting. Delay in assessment, intervention and transportation must be avoided (Sloane & Pessl, 2007). Airway compromise and hypoxia are the common problems which arose among trauma patients at the trauma scene (Lockey 2001). Airway assessment is a priority in a trauma case. Adequate airway, oxygenation and ventilation are initial approaches in airway management. Assessment of the breathing pattern is crucial in airway management to ensure good ventilation. Cervical and spinal protection is mandatory for all trauma cases especially for unconscious patient. Likewise, evaluation of the airway obstruction with solid or fluid, gag reflex and other that related to airway compromise must be assessed rapidly (Sloane & Pessl, 2007). A pre-hospital care provider is required to apply an appropriate intervention base on airway assessment. Airway and breathing interventions consists of non-ventilated and ventilated procedures which by all means administering oxygen such as a non re-breather mask, naso and oral-pharyngel airway, bag-valve-mask and intubation (Kene & Davis, 2007). A pre-hospital care provider should be able to perform intubation if needed. According to the Advance Trauma Life Support protocol, endotracheal intubation must be inserted for all trauma victims with Glasgow Coma Scale (GCS) less than 9 (McDermott et al., 2005). Basic airway management practice by pre-hospital care provider at the scene contributes the higher mortality rate compared to intubation at scene (Davis et al., 2003 Smith & Conn, 2009). Circulation is referred to the presence of the pulse and blood circulation. Meanwhile, hypovolemic shock is a compilation in trauma due to loss of the blood. Identifying signs and symptoms of hypovolemic shock by proper assessment is important to give the correct intervention. Insertion of two large bore of intravenous (IV) cannula and IV fluid therapy constitutes the right intervention for securing

blood circulation, (Sloane & Pessl., 2007). According to Smith & Conn, (2009) insertion of two large IV lines is one of the standard protocols in a pre-hospital care.

2.8 Triage Decision

The main goal in trauma assessment and intervention is to reduce mortality and morbidity rate. Determination of the character and the measurement of patient injury immediately and precisely become the major challenges to pre-hospital care providers. Severity of the patient will be evaluated through triage system.

Triage is defined as a classification of the patient according to the severity and medical need (Camp & Yates, 2001). Mauger & Deakin, (2001) clarified that the word of triage comes from France word *trier,* which means to sort. In addition, there are two types of triage which is hospital triage and field triage. The hospital triage usually is used in a hospital setting for those patients arrived in emergency department. The triage officer will make the triaging according to the patient condition. Meanwhile, field triage is used out of hospital setting or incidence location like road site, mass disaster of that involve more than one patients. Colour coding (red, yellow and green) is used to classify the severity of patient. The critical or severe patient will be in the triage as red coding. Yellow coding is for semi critical cases and green for non-critical cases. All in all, triage coding must be made correctly to avoid delay in treatment.

In addition, triage coding is a key decision protocol of pre-hospital care to get the patient to the right facility. Thus, error in triage should be avoided. Faults can occur

in assessment, incorrect intervention, medication errors, improper treatment and wrong triage coding. The USA Institute of Medicine (IOM) (2000) and The UK National Patient Safety Agency (2004 reported high death rate due to medical errors each year. These reports acknowledged that most of the errors were directly caused by health care providers (Williams, 2007).

CHAPTER 3

METHODOLOGY

3.1 Study Location

3.1.1 Emergency Department Hospital Kuala Lumpur (EDHKL)

3.2 Study Design

3.2.1 Retrospectives cross sectional study using secondary data from patient medical records.

3.3 Sampling Data Range Year

3.3.1 Data taken from cases recorded during 1 Jan 2011 until 31 December 2011

3.4 Sampling

3.4.1 Study Population

Trauma cases responded by pre-hospital care provider from Emergency Department Hospital Kuala Lumpur

3.4.2 Sampling Method

Simple random sampling method has been used in this study. From the pool of data record, all trauma cases were withdrawn and sort out. Every second data sheet consider as sampling.

3.4.3) Sample Size

Cochran (1963) formulated a formula that could be used in the calculation of the sample size in a stud: $\mathbf{n = (Z^2\ PQ)/\ e^2}$

n = Sample size

z = Confidence interval

p = estimated proportion of the attribute under study

q = derived from 1 – p

e = the precision level

In this study:

95% Confidence interval of z = 1.96

5% precision level (0.05)

$\mathbf{n = (Z^2\ PQ)/\ e^2}$

$n = 1.96^2\ [0.5\ (0.5)]\ /\ 0.05^2$

n = 3.8416 (0.25)/0.0025

n = 0.9604 / 0.0025

n = 384.16

n = 384.16 + 15% consider draw out rate (missing data and damage data sheet)

n = 441.78

n = 442

3.4.4 Inclusion Criteria

3.4.4.1 Trauma cases records responded by pre-hospital care EDHKL

3.4.4.2 Trauma cases records for Malaysian and non – Malaysian resident.

3.4.5 Exclusion Criteria

3.4.5.1 Death cases at location.

3.4.5.2 Paediatric patients aged below 12 years old.

3.5 Instruments and Data Collection

3.5.1 Instrument

A data collection instrument and porforma was design to collect data from the standard sheet used by pre-hospital care provider EDHKL. The content for these perfoma include sections A, B, C, D and E.

Section A application of team background which is Assistant Medical Officer (AMO) and Staff Nurse (SN), years experiences and courses attended. Time of respond of case and type of trauma such as home, road and industrial also recorded. Section B is about assessment section application of consciousness level, airway, speech quality and Glasgow Coma Scale (GCS). This section will also indicate whether any omission in documentation of patient assessment done by the pre-hospital care providers. Based on PHC protocol in EDHKL, the patient proforma

sheet is mandatory to fulfil. Therefore, the omission will be evaluate base on any incomplete of patient proforma. Section C is focused on intervention practice. Appropriate or inappropriate intervention will be indicate. The judgement in this section is based on emergency medicine service (EMS) protocol and initial intervention at Emergency Department (ED) by a physician who subsequently used the early assessment. Section D is all about triage decision which is coded as green which indicate non-critical cases, yellow coding is semi-critical cases and red coding is refer critical cases (refer to appendix for triage category explanation). A medical report is used to confirm whether a patient has been placed in the correct triage coding. Finally, section E is about intervention in ED by a physician upon arrival of the patient in ED. The same criteria of evaluation applies; access airway, breathing, circulation and disability.

Assessment and intervention will be charted by pre-hospital care providers using the original form. The evaluation of the assessment and intervention done by pre-hospital care providers were undertaken by two major references; the emergency medicine protocol and complete medical report from Medical Officer (doctor). The emergency medicine protocol and complete medical record is be used to confirm that intervention and triage decision done by pre-hospital care providers is correct or incorrect. The data collection instrument is a set of question that used by researcher while collecting data. The data collection instrument is valid instruments that were adapted from Rittenberger et al., (2005) and modification has been done based on the studies requirements. The content for these instruments were also divided into 5 sections similarly like porfoma. These data collection instrument and porfoma sheet (refer appendix) were used by the researcher for data collection purpose.

3.5.2 Data Collection technique

The pre-hospital record and Medical report from 1 January 2011 to 31 December 2011 were obtained from retrospective PHC record and medical reports were obtained from Emergency Department medical record office. The PHC data were recorded into the proforma. The medical report that completed by MO and Emergency Medicine protocol will be used to determine and evaluate the correctness of the interventions and triage decision that perform by PHC providers. The medical record and PHC data were return back to staff at medical record once record collection phase completed.

3.6 Data Analysis

All the data collected were analyzed using the software Statistical Analysis Package for Social Science (SPSS for window version 17.0). Frequency and percentage of omission, inadequacies and correctness of triage decision were analysed by descriptive analysis. The Chi square test was used to relationship between working experiences and GCS with triage decision. Kappa test were used to compare triage decision between PHC and Medical Officer (MO) triage. Statistically p value ≤ 0.05 was adopted as the significant level.

3.7 Ethical Consideration

Approval on ethics from ethics committee, Faculty of Medicine and Health Sciences, University Putra Malaysia and approval from Medical Research Ethics committee, Ministry of Health Malaysia, were obtained.

CHAPTER 4

RESULTS

4.1 Introduction

This chapter discusses the findings from the data analysis. The findings are sorted according to various sections; professional status, assessment and intervention, and relationships of professional status and triage decision, and assessment, and triage decision. The pie and bar charts, and descriptive statistics tables are used to present the percentage of professional status, assessment and intervention. In addition, tables of synthesis of chi square test are used to present the relationship analyses.

4.2 Pre-hospital Care Status

Pre-hospital care (PHC) professional status includes professional background, years of experience and relevant courses attended.

4.2.1 Profession background and cases responded

A total of 50 PHC providers i.e. 21 (42.0%) Assistant Medical Officers (AMO) and 29 (58.0%) Staff Nurses (SN) were present in this study. There were a total of 428 trauma cases responded or attended; two – hundred and three (47%) cases ware attended by AMO as team leader and 225 (53%) cases were lead by SN.

Figure 2 - Distribution of the pre-hospital care professional categories

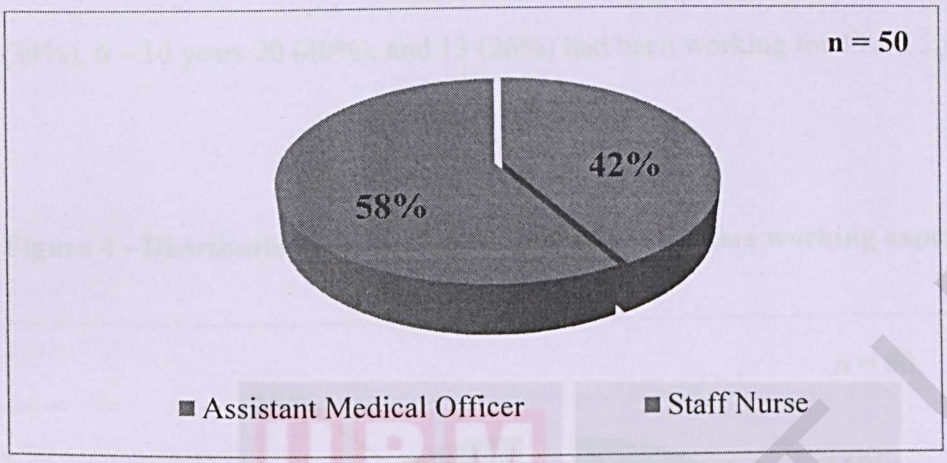
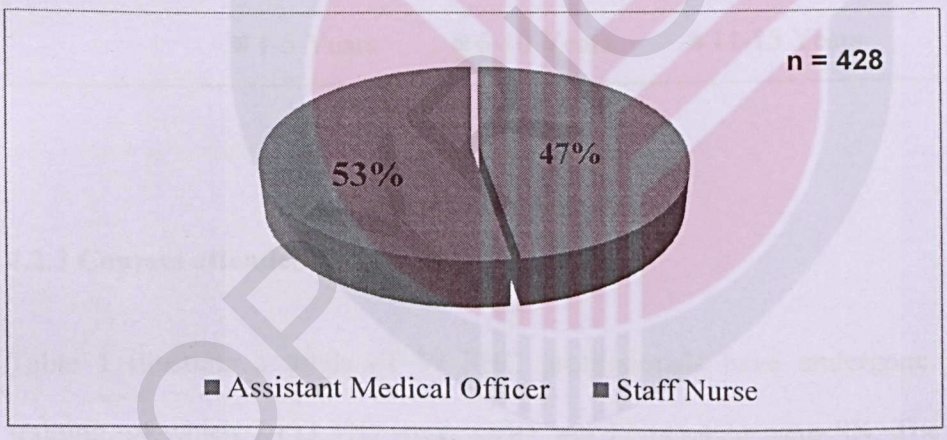


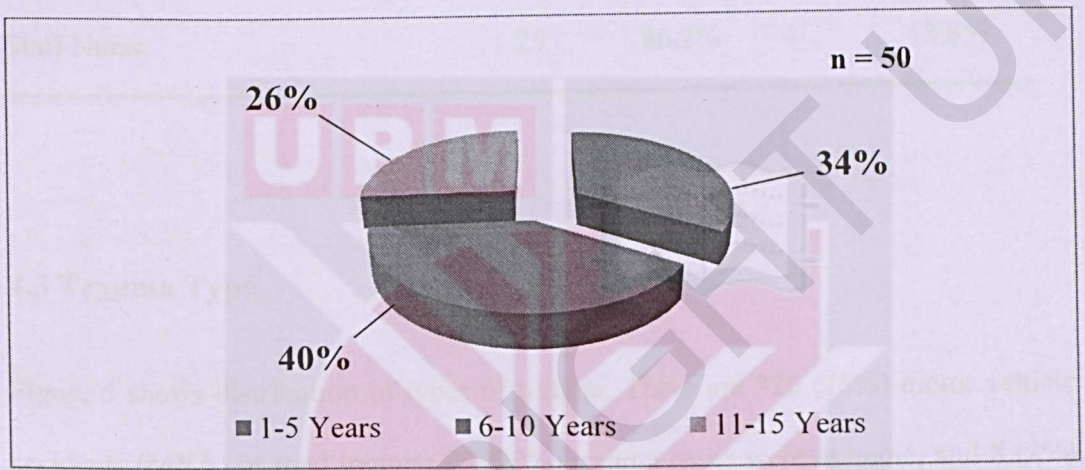
Figure 3 - Distribution of the pre-hospital care providers who responded to the trauma cases



4.2.2 Working experience

Majority of PHC professionals had working experience of between 1 – 5 years, 17 (34%), 6 – 10 years 20 (40%), and 13 (26%) had been working for 11 – 15 years.

Figure 4 - Distribution of the pre-hospital care providers working experience



4.2.3 Courses attended

Table 1 illustrate a totals of 19 PHC professionals have undergone post basic training, of which 7 (33.3%) were AMO and 12 (41.4%) were SN. The remaining does not have post basic training. However, 42 PHC providers had their pre-hospital care training, of which 17 (80%) were AMO and 25 (86.2%) were SN.

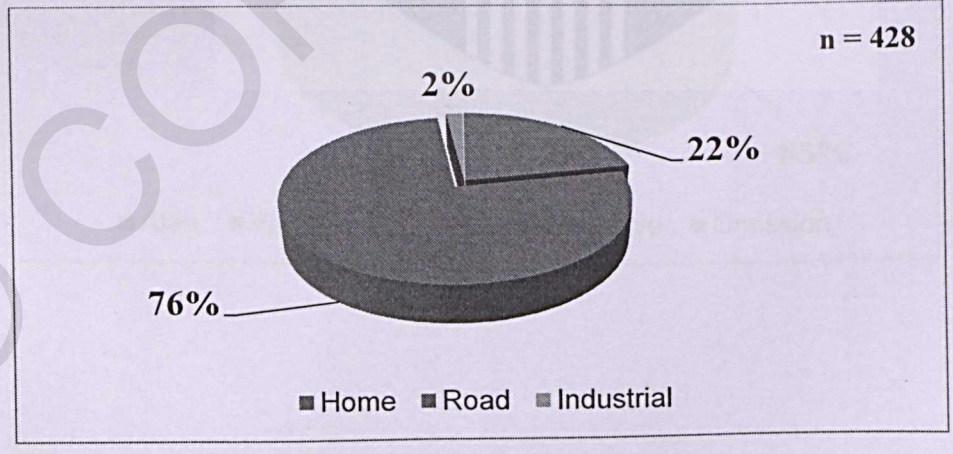
Table 1 Frequency of the courses attended by pre-hospital care providers

n = 50	Yes		No	
Post Basic	**n**	**(%)**	**n**	**(%)**
Assistant Medical Officer	7	33.3%	14	78.8%
Staff Nurse	12	41.4%	17	58.6%
Pre-Hospital Care	**n**	**(%)**	**n**	**(%)**
Assistant Medical Officer	17	81.0%	4	19.0%
Staff Nurse	25	86.2%	4	13.8%

4.3 Trauma Type

Figure 5 shows distribution of types of trauma. There are 326 (76%) motor vehicle accidents (MVA) or road trauma; 94 (22%) trauma cases were at home, and 8 (2%) trauma cases were in the industrial environment.

Figure 5 – Distribution of the types of trauma



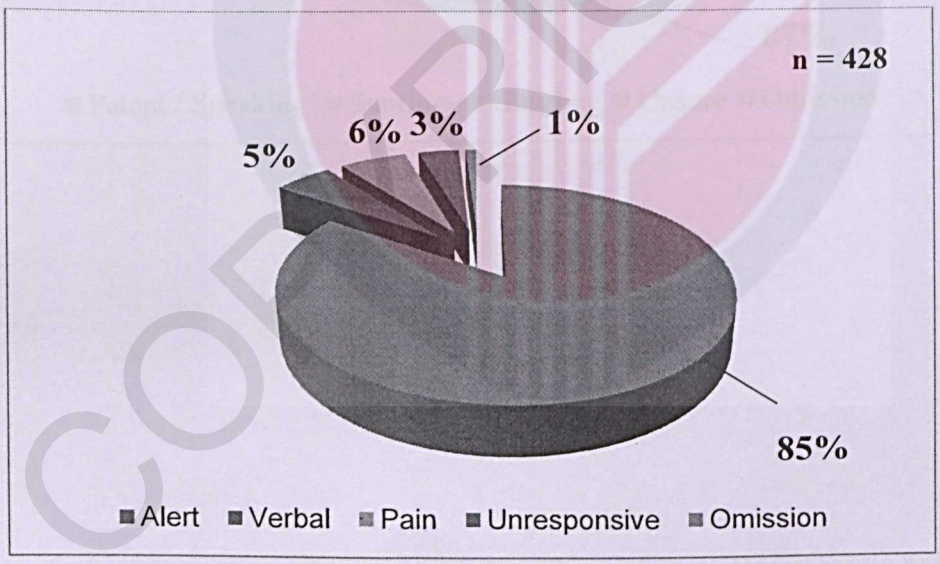
4.4 Assessment

PHC assessment emphasizes on patient consciousness level, airway, speech quality and Glasgow Coma Scale (GCS).

4.4.1 Consciousness level assessment

A total of 362 (85%) patients were recorded as alert, 22 (5%) were assessed through verbal assessment and 25 (6%) were determined through pain stimulation. There were 15 (3%) cases who were unresponsive, and only 4 (1%) omissions of conscious assessment were identified.

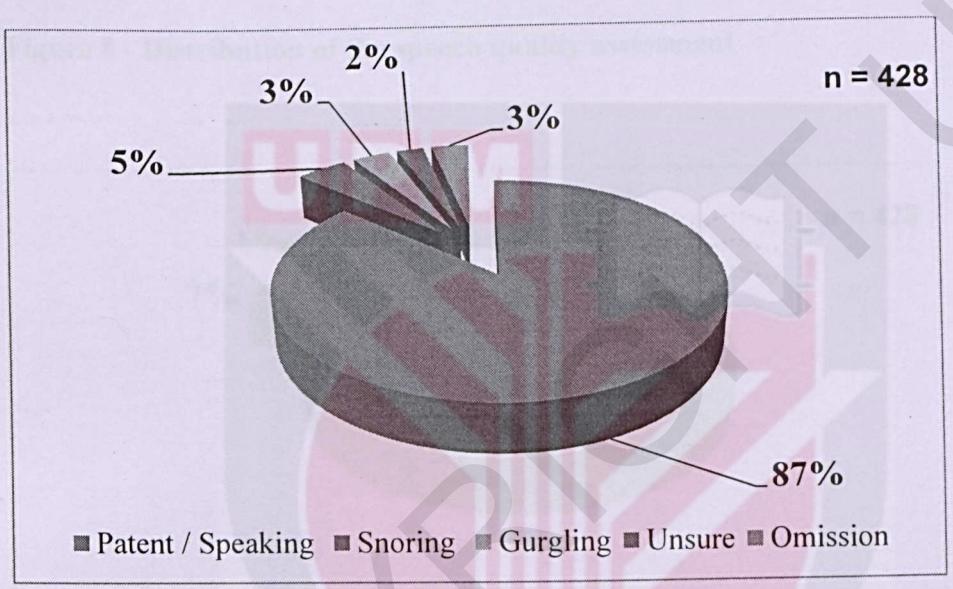
Figure 6 - Distribution of the consciousness level assessment



4.4.2 Airway assessment

A total of 371 (86.7%) patients had patent airway and speaking, 19 (4.4%) were snoring, 14 (3.3%) gurgling sound, 10 (2.3%) cases were documented as unsure and 14 (3.3%) cases were in the omission category.

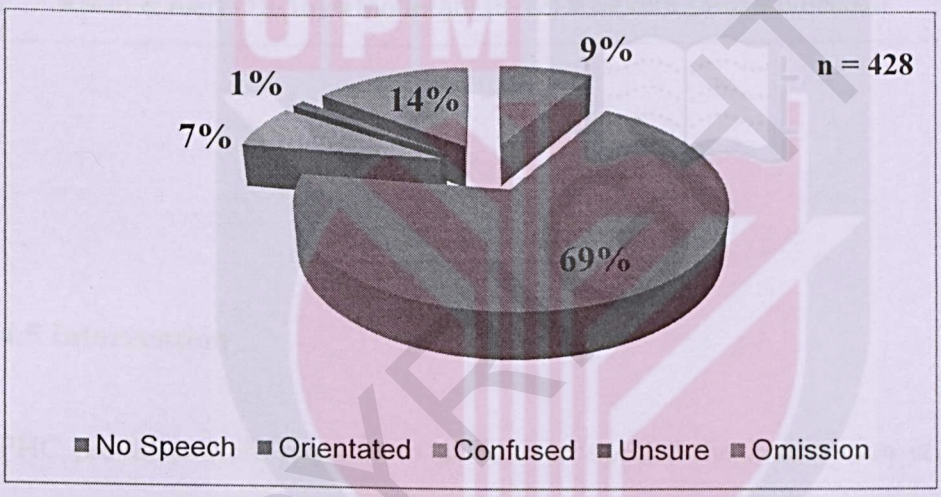
Figure 7 - Distribution of the airway assessment categories



4.4.3 Speech quality assessment

Figure 6 show distribution of proportion of quality of speech assessment categories. Two hundred and ninety-four (68.7%) patients classified as orientated, 37 (8.6%) with no speech, 30 (7%) were confused and five (1.2%) category as unsure. However 62 (14%) assessments were in the omission category.

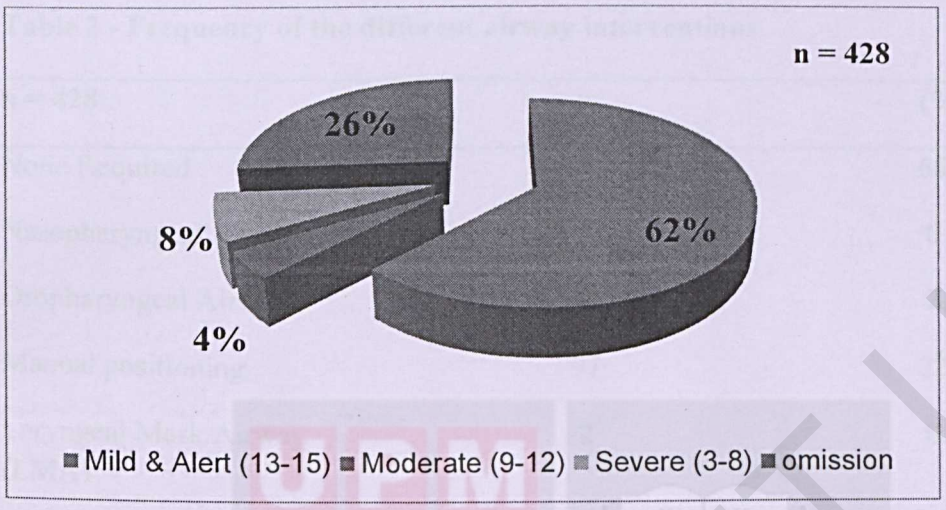
Figure 8 - Distribution of the speech quality assessment



4.4.4 Glasgow Coma Scale (GCS)

Figure 9 illustrates the proportion or percentage of GSC scores assessment. A total of 267 (62%) patients were categorized as alert with mild of GCS (13 – 15), 18 (4%) moderate (9 – 12), 32 (8%) severe (3-8) and 111 (26%) omissions were indentified from the records.

. **Figure 9 - Distribution of the GCS assessment / scores**



4.5 Intervention

PHC providers were required to perform or applied the intervention at the scene before transferring patients to the nearest hospital. The PHC intervention includes airway and breathing control, circulation, immobilization and haemorrhage control.

4.5.1 Airway intervention

Table 2 indicates 295 (68.9%) patients did not require any airway intervention. One (0.2%) patient received nasopharyngeal airway, 8 (2%) oropharyngeal airways, 97 (22.7%) manual positioning, 2 (0.5%) laryngeal mask airway (LMA), 1 (0.2%) needed intubation and 24 (5.6%) patient received inadequate intervention.

Table 2 - Frequency of the different airway interventions

n = 428	n	(%)
None Required	295	68.9
Nasopharyngeal Airway	1	0.2
Oropharyngeal Airway	8	2.0
Manual positioning	97	22.7
Laryngeal Mask Airway (LMA)	2	0.5
Endotracheal Intubation	1	0.2
Inadequate Intervention	24	5.6

4.5.2 Breathing intervention

The frequencies of the breathing interventions are shown in Table 3. Majority patient of the patients did not require oxygen involving 329 (76.9%) patients, 8 (1.9%) nasal prongs and requiring high flow mask 55 (12.9%). There were 14 (3.3%) needing bag valve mask ventilation and 22 (5.1%) received inadequate intervention.

Table 3 - Frequency of the different type breathing interventions

n = 428	n	(%)
No Oxygen Required	329	76.9
Nasal Prong Oxygen	8	1.9
High Flow Mask Oxygen	55	12.9
Bag Valve Mask Ventilation	14	3.3
Inadequate Intervention	22	5.1

4.5.3 Intravenous interventions

Table 4 illustrates the various interventions of the blood circulation. There were 273 (63.8%) patients did not require any circulation intervention, 66 (15.4%) needed IV cannula, 51 (11.9%) were given IV fluids and 38 (8.9%) cases were classified as inadequate interventio.

Table 4 - Frequency of the Intravenous intervention

n = 428	n	(%)
No Intervention Required	273	63.8
IV Cannula	66	15.4
IV Fluids	51	11.9
Inadequate Intervention	38	8.9

4.5.4 Immobilization intervention

Table 5 indicates the frequency of immobilization intervention. A total of 128 (29.9%) patient did not require any immobilization, 50 (11.7%) needed cervical collar and 13 (3%) required spinal board. For upper and lower limbs each one recorded 34 (7.9%) and 58 (13.6%) respectively. Three patients (0.7%) had traction splint, 61 (14.3%) patients' required more than one immobilization and 81 (18.9%) interventions were inadequate.

Table 5 - Frequency of the different immobilization interventions

n = 428	n	(%)
None Required	128	29.9
Cervical Collar	50	11.7
Spine Board	13	3.0
Upper Limb	34	7.9
Lower Limb	58	13.6
Traction Splint	3	0.7
More than One Immobilization	61	14.3
Inadequacies of Intervention	81	18.9

4.5.5 Haemorrhage control Interventions

Table 6 reveals the frequency of the various haemorrhage control. A total of 234 (54.7%) patients did not require intervention in haemorrhage control, 12 (2.8%) patients needed gauze to control bleeding, 94 (22%) patients required bandage compression, 2 (0.5%) patients received haemostatic sutures at the scene by the PHC providers and 86 (20.%) cases were classified as "inadequate intervention".

Table 6 Frequency of the haemorrhage control interventions

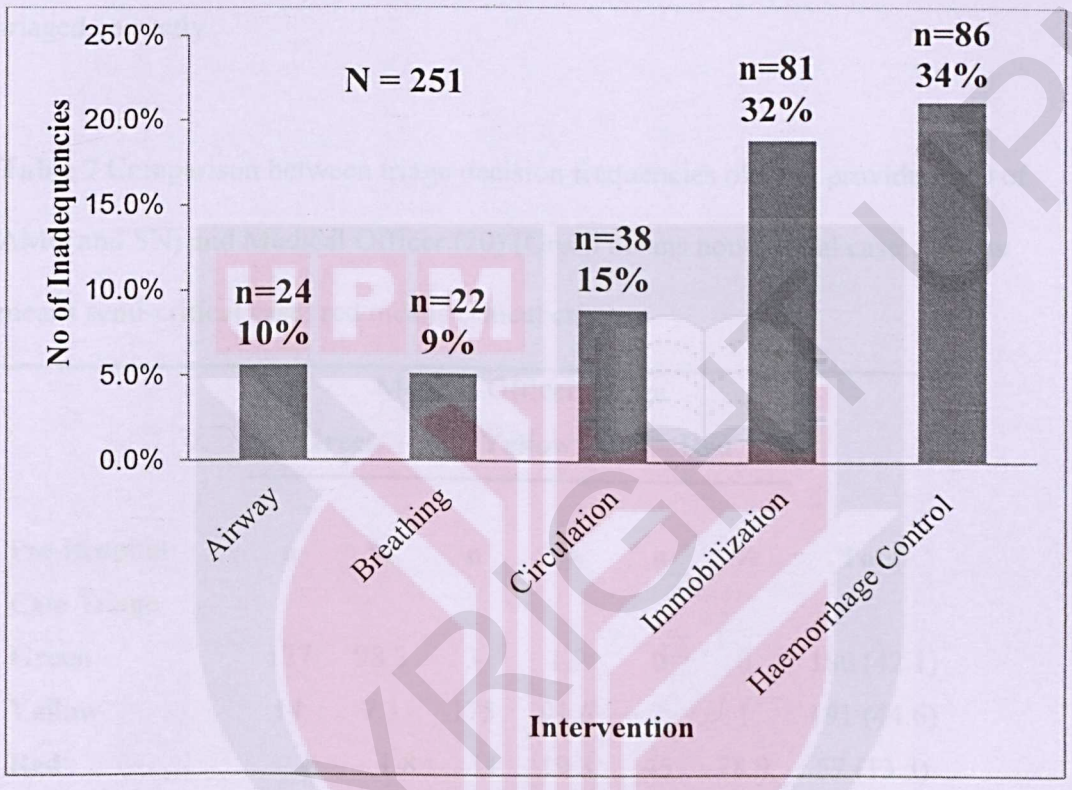
n = 428	n	(%)
None Required	234	54.7
Gauze	12	2.8
Bandage Compression	94	22.0
Haemostatic Sutures	2	0.5
Inadequate Intervention	86	20

4.5.6 Inadequate Interventions

Inadequate or inappropriate interventions occurred in each category of intervention, and these were identified as Figure 10. Based on five intervention practices, there were 24 (10%) patients receiving inadequate airway intervention; 22 (9%) breathing intervention; 38 (15%) circulation intervention; 81 (32%) inadequate immobilization intervention, and 86 (34%) patients receive inappropriate haemorrhage control intervention. Thus, based on these result it can concluded that some PHC providers

in EDHKL were unable to provide the correct interventions to patients as based on the trauma protocol.

Figure 10 Distributions of the difference categories of Inadequate Interventions



4.6 Triage decision

4.6.1 Comparison between triage decision frequencies of PHC providers and Medical Officer

Table 7 illustrates distribution of the comparison triage decision between PHC provider and Medical Officer (MO) triage decision. Kappa test were performed to analyze the comparison triage decision between PHC provider and MO. The evaluation of the PHC triage decision is determine based on MO triage decision and Emergency Medicine protocol. PHC triage decisions for green classification were

180 (42.1%), while MO were 192 (44.9%). Similarly in yellow classification, PHC triage decision were 191 (44.6%) and MO 189 (44.2%). Future more, PHC triage decision for red classification were 45 (78.9%), meanwhile MO were 57 (13.3%). From the 428 triage decision done by PHC providers, there are 404 (94%) cases were triaged correctly.

Table 7 Comparison between triage decision frequencies of PHC providers (50 of AMO and SN) and Medical Officer (20) (Green means non-critical case; Yellow means semi-critical case; red means critical case)

	Medical Officer Triage						
	Green		**Yellow**		**Red**		
Pre-Hospital Care Triage	**n**	**%**	**n**	**%**	**n**	**%**	**Total**
Green	177	98.3	3	1.7	0	0	180 (42.1)
Yellow	14	7.3	175	91.6	2	1	191 (44.6)
Red	1	1.8	11	19.3	45	78.9	57 (13.3)
Total	192	44.9	189	44.2	47	11	

K = 0.879*

*** Significant at $p \leq 0.01$**

4.7 Relationship between years of experiences and PHC triage decision

Table 8 illustrates the relationship between years of working experiences and PHC triage. The association relationship was analyze using chi square test. There is no significant relationship between year experiences and PHC triage ($p > 0.05$). Eighty-six (39.4%) patient ware triage as green classification done by PHC providers with working experiences between 1-5 years, 54 (41.9%) patients were triage by PHC providers with working experiences between 6-10 years and 40 (49.4%) patients were triage by PHC providers with working experiences between 11-15 year is Meanwhile, yellow classification done by PHC providers with working experience 1-5 years were 99 (45.4%) patients, 60 (46.5%) done by PHC providers with working experiences between 6-10 years and 32 (39.5%) patient triaging done by PHC providers with working experiences between 11-15. This study found the small percentage in critical cases responded by PHC providers HKL. A total of 33 (15.1%) red classification were triage by PHC provider with working experience between 1-5 years, 15 (11.6%) were triage by PHC provider with working experience between 6-10 years and 9 (11.1%) were triage by PHC provider with working experience between 11-15 years.

Table 8 Association between years of working experiences and PHC triage decisions (Green means non-critical case; Yellow means semi-critical case; red means critical case)

Year Experience	Pre-Hospital Care Triage						χ^2	df	p
	Green		Yellow		Red				
	n	%	n	%	n	%			
1-5	86	39.4	99	45.4	33	15.1	3.111[a]	4	0.539*
6-10	54	41.9	60	46.5	15	11.6			
11-15	40	49.4	32	39.5	9	11.1			

***Significant relationship at p-value of < 0.05**

4.8 Relationship between assessment and PHC triage decision

4.8.1 Relationship between consciousness level assessments and PHC triage decisions

Table 9 clearly showed the relationship between conscious level with PHC triage decision. The analyses for this result were performed using chi square test. There were significant relationships between conscious level with PHC triage decision i.e. ($p \leq 0.01$). 100% of unresponsiveness were triage as critical cases or red classification triage.

Table 9 Association between consciousness level assessments and PHC triage decisions (n=424). As analysis by (Green means non-critical case; Yellow means semi-critical case; red means critical case)

Consciousness level	Pre-Hospital Care Triage						χ^2	df	p
	Green		Yellow		Red				
	n	%	n	%	n	%			
Alert	172	47.5	177	48.9	13	3.6	228.032[a]	6	0.002
Verbal	6	27.3	5	22.7	11	50			
Pain	0	0	7	28	18	72			
Unresponsive	0	0	0	0	15	100			

***Significant relationship at p-value of ≤ 0.002**

4.8.2 Relationship between airway assessment with PHC triage decision

Table 10 indicates relationship between airway assessments with PHC triage decision. The significant relationship was shown in this result with ($p \leq 0.01$). Most of the patients were able to speak with patent airway. One hundred seventy (45.8%) were triage as green classification, 181 (48.8%) yellow classification and 20 (5.4%) were triage red classification. Patient presented with snoring sound airway were triage as 3 (15.8%) yellow and 16 (84.2%) red respectively. Patients presented with gurgling sound were triaged in yellow and red classification. Three (21.4%) were triage in yellow and 11 (78.6%) were triage as red classifications.

Table 10: Association between airway assessments and PHC triage decision (n=414) as analyse by fisher exact test (Green means non-critical case; Yellow means semi-critical case; red means critical case)

Airway	Pre-Hospital Care Triage						χ^2	df	p
	Green		Yellow		Red				
	n	%	n	%	n	%			
Patent / Speaking	170	45.8	181	48.8	20	5.4	211.771[a]	8	0.002
Snoring Sound	2	10.5	3	15.8	14	73.7			
Gurgling Sound	1	7.1	3	21.4	10	71.4			
Unsure	2	20	1	10	7	70			

***Significant relationship at p-value of ≤ 0.002**

4.8.3 Relationship between speech quality assessment with PHC triage decision

Table 11 reveals the frequency of relationship between speech quality assessments with PHC triage decision. There was significant relationship between those parameters ($p \leq 0.01$). Patients presented with orientated speech quality contributed to the majority of the cases i.e. 142 (48.3%) and were triage as green classification, 141 (48%) were triage as yellow classification and 11 (3.7%) were in red classification.

Table 11: Association between speech quality assessments and PHC triage decisions (n=366) (Green means non-critical case; Yellow means semi-critical case; red means critical case)

Speech Quality	Pre-Hospital Care Triage						χ^2	df	p
	Green		Yellow		Red				
	n	%	n	%	n	%			
No Speech	4	10.8	9	24.3	28	64.9	171.544[a]	8	0.001
Orientated	142	48.3	141	48	11	3.7			
Confused	9	30	10	33.3	11	36.7			
Unsure	1	20	2	40	2	40			

***Significant relationship at p-value of ≤ 0.001**

4.8.4 Relationship between Glasgow Coma Scale (GSC) with PHC triage decision

Table 12 reveals the distribution of relationship between GSC with PHC triage decision. There were significant association between GSC and PHC triage decision i.e. ($p \leq 0.01$).

Table 12: Association between GSC Categories and Pre-hospital care triage decision (n=317) (Green means non-critical case; Yellow means semi-critical case; red means critical case)

Pre-Hospital Care Triage decision	Severe		Moderate		Mild		χ^2	df	p
	n	%	n	%	n	%			
Green	3	2.5	2	1.5	118	96	204.866[a]	6	0.002*
Yellow	2	1.4	7	5.0	131	93.6			
Red	27	48.2	11	19.6	18	32.1			

***Significant relationship at p-value of ≤ 0.002**

CHAPTER 5

DISCUSSION AND CONCLUSION

5.1 Discussion

This chapter emphasized on the discussion of the study findings. The descriptive finding of PHC professional status (position, year experience and training attended), type of trauma cases and assessment (consciousness level, airway, speech quality and GCS score), and intervention practice among PHC (airway, breathing, circulation, immobilisation and haemorrhage control) were discussed. In addition, comparison and percentage of correctness of triage decision performed by PHC providers also were discussed in this chapter. The relationship between dependent and independent variable such as year experience and assessment with triage decision were discussed and will be supported by literature. The conclusion is included in this chapter.

5.2 Pre-hospital Care Status

From 442 PHC data of 2011 cases obtained from EDHKL, only 428 were used in this study. There were fourteen samples excluded from this studied because they did not fulfil the inclusion criteria. From the data, SN made up the majority of the persons who responded to the cases i.e. 225 (53%), while 203 (47%) responded by AMO. There were no researches done to determine their professional background. Thus, the possible reason contributing to this issue is lack of case during working hour. In addition, based on EDHKL data the quantity of SN in department is more

compared to the AMO number. In Scotland, serious injuries were mainly attended by paramedics rather than medical technicians (Sukumaran et al., 2005).

This study indicates that the higher number i.e. 218 (51%) PHC providers who responded to the cases had working experience between 1-5 years. It shows that, those juniors or new staffs are prone to be working at field compared to the senior staff. Similarly, a study done abroad showed that a PHC provider in Australia is required to have a minimum of 2 year working experience to respond to cases without any supervision (Woodall et al., 2007).

This study revealed that PHC professionals need to have additional training which is post basic course and PHC course. However, when we looked at the percentage between post basic course and PHC course there were a large degree of difference in term of percentage between both courses. PHC providers who had post basic course was 12 (41.4%) for SN and 7 (33.3%) were AMO. However, more than 80% of PHC providers had their PHC course i.e. AMO 17 (81%) and 25 (86.2%) SN. There several reason many AMO and SN had their PHC course. Firstly was course coordination, secondly course duration, and the third factor was course requirement and the policy. Generally, post basic course is an advanced emergency course which was conducted by MOH, but it did not fully focus on PHC training. This is a 6-month course and any PHC providers who like to attend this course must get the study leave. The requirement for post basic course is at least a PHC providers must have 3 years working experiences, and in some situation, the priority will be given to senior PHC providers, and with permission from the their respective Head of

Department. Meanwhile, at present, the PHC course is an in-house training, which is being conducted by the Emergency Department (ED). PHC course will be organized in three days and this is a compulsory course for those working in PHC unit. In contrast, study done in USM mentioned there are no formal curriculums available in Malaysia even though the government had issued instructions to improve the PHC services (Nik Hisamuddin et al., 2007). However, the course attended by PHC providers is similar to that of paramedic and pre-hospital advanced trauma life support (PHATLS) course and basic trauma life support (BTLS) as practiced in many countries such as Australia, UK, Singapore and other developed countries (McDermott et a., 2005). In Japan, the evolution in PHC training programme begun since 1978 with First aid courses and BLS, and with later introduction of the Emergency Life-Saving Technician (ELST) in 1991 (Tanigawa & Tanaka, 2006).

5.3 Trauma Type

A trauma case is among the leading cases that contribute to increasing morbidity and mortality rate. In this study, trauma cases were divided into three subgroup consisted of home, road and industrial trauma. Results indicated that 326 (76%) motor vehicle accidents (MVA) or road trauma; 94 (22%) trauma cases were at home and 8 (2%) trauma cases were in the industrial environment. Therefore, comparable to Nik Hisamuddin et al., (2007), the higher incidence recorded highest occurred on the road, followed by home and work place. In addition, a study done in Singapore shows similar numbers of trauma cases attended by PHC services due to MVA and home accidence (Seow, Wong & Phe 2001). Tanigawa and Tanaka (2006) said, in

Japan, since 1996 until 2003 trauma cases were respond and transported by PHC services.

5.4 Evaluation of the omission assessment

In this study, assessments sections were evaluated in four categories, to indicate whether PHC providers fully complete in the documentation or omission occurred. The evaluation includes consciousness level assessment, airway assessment, speech quality assessment and GCS assessment. Result showed that there were omission occurred in every assessment component.

Result found that, most PHC providers performed the consciousness level assessment. However, omission was noted in a small percentage i.e. 4 (15%). A total of 362 (85%) patients were recorded as alert, 22 (5%) have been assessed by verbal assessment, 25 (6%) were determined through pain stimulation and 15 (3%) unresponsive patients.

In term of airway assessment, the number of omission in the documentation is 14 (3.3%). The majority (86.7%) of patients is were able to speak with patent airway, recorded snoring sounds were 19 (4.4%), gurgling sound were 14 (3.3%), and 10 (2.3%) cases were documented as unsure.

In speech quality assessment, patients were noted to be orientated, no speech, confused and unsure. Results indicated that majority of the assessments made were documented properly with 294 (68.7%) patients classified as orientated, 37 (8.6%)

with no speech, 30 (7%) confused and 5 (1.2%) categorised unsure. However, 62 (14%) assessments were in the omission categories.

Glasgow coma scale (GCS) is an important protocol and assessment in trauma cases (McDermott et al., 2005). This is a difficult and complicated assessment and rated as GCS scores. GSC score will be determined in 3 crucial components which included best eye respond, best verbal respond and best motor respond. The lowest score is 3/15, and the best score is 15/15. Thus, GCS were classified in three classifications; mild or alert, moderate and severe. Therefore, it is possible that omission in GCS assessments recorded relatively the highest percentage i.e. 111 (26%) than other assessments mentioned. A total of 267 (62%) patients were categorized as having mild or alert score (13 – 15), 18 (4%) moderate, 32 (8%) severe (3-8). The efficiency GSC assessment among PHC providers should always be high. Nurses from ED frequency encounter patients who were in critical condition and they are able to recognize patients with a neurological problem by GCS score (Edwards, 2001).

In this study, omissions occurred in every component of assessment in various numbers. There were several reasons that contributed to the omission of PHC documentation. These include redundant forms, recurring records and language barriers (Strong & Thompson, 2000). Omission in consciousness level assessment is 4 (1%), airway assessment 14 (3.3%), 62 (14%) omission in speech quality assessment and 111 cases (26%) in GCS assessment. The PHC documentation is a medico-legal document, and PHC providers are required to fully complete filling in the PHC documentations. This study is similar to the study by Laudermilch et al.,

(2010) and Rittenberger et al., (2005). A total of 465 patients record had incomplete documentation or omission in all 3 assessments including 102 cases in blood pressure, 25 omissions in pulse and 338 cases omission in respiratory rate documentation (Laudermilch et al., 2010). According to Rittenberger et al., (2005), there was omissions occurred done by PHC providers in Mid-Atlantic resuscitation chest pain patients.

5.5 Evaluation of the inadequacies or inappropriate intervention

This study also wants to determine the percentage of the inadequacies or inappropriate intervention practice among PHC providers. The final evaluation is based on physician report and Emergency Medicine protocol. Airway interventions were categorized as follows; airway, breathing, blood circulation, immobilization and haemorrhage control.

Findings showed that 24 (5.6%) inadequacies in airway intervention were identified. Airway intervention included providing nasopharyngeal airway 1 (0.2%), oropharyngeal airway8 (2%), manual positioning 97 (22.7%), laryngeal mask airway (LMA) 2 (0.5%), intubation 1 (0.2%) and 295 (68.9%) patients did not require any airway intervention. Breathing inadequacies also occurred in 22 (5.1%) cases. A total of 77 (18.1%) received breathing interventions, which were 8 (1.9%) nasal prong oxygen, 55 (12.9%) high flow mask oxygen and 14 (3.3%) patient were applied with bag valve mask (BVM). However, a total of 329 (76.9%) is not required oxygen therapy.

Blood circulation assessment is an insertion of intravenous (IV) which IV cannula and IV fluids. Patients who received inappropriate intervention in circulation were 38 (8.9%). However, a total of 273 (63.8%) patient did not require any IV insertion. A total of 66 (15.4%) patients were inserted with IV cannula, and 51 (11.9%) patients were provided IV cannula with IV fluids in the field. PHC intervention for replacement and maintaining body fluid, and electrolyte in trauma cases were reported through administration IV fluid therapy (Lockey, 2001). The PHC providers had authority to start the IV fluid administration at the field before transport patient to the hospital (Boyle, 2009).

Immobilization interventions showed that 81 (18.9%) patients received inadequate intervention. A total of 158 (36.9%) provided at least one immobilization intervention included applied cervical collar, spine board, upper and lower limb splinting, and traction splint. Sixty one (14.3%) patients received more than 2 immobilizations and 128 (29.9%) did not require any intervention.

Hypovolemic shock is a complication due to blood loss and common in trauma or accident or crush injury (Strickler, 2010). Thus, a haemorrhage control is one of the interventions that can prevent from hypovolemic shock. Unfortunately, findings proved 86 that (20%) haemorrhage controls inadequacies occurred. A total of 234 (54.7%) patients did not having any bleeding or haemorrhage the resulted none required intervention. Twelve (2.8%) cases needed gauze intervention, 94 (22%) bandage compression and 2 (0.5%) patients had haemostatic sutured at fields.

Lockey (2001) mentioned that the appropriate PHC intervention in term haemorrhage control is providing compression directly to the bleeding site.

Intervention inadequacies which were identified in trauma cases responded by PHC providers were as follows; 24 (5.6%) inadequacies in airway intervention, 22 (5.1%) inadequacies in breathing intervention, 38 (8.9%) inadequacies in blood circulation intervention, 81 (18.9%) inadequacies in immobilization intervention and 86 (20%) inadequacies in haemorrhage control intervention inadequacies. This study's results were similar to those reported in others countries e.g Australia and USA, (Washington and Atlanta). McDermott et al., (2005) found that there were PHC management inadequacies in trauma cases in Victoria, Australia. Inadequacies occurred in various component including system inadequacies, intervention and management strategy, technique inadequacies, error in diagnosis and delay in diagnosis. A total of 394 (67%) errors in management identified, and 245 (62%) were contributed to mortality prevalence. In addition, a common inadequacy among PHC in Victoria is failure to provide the advance airway management which is intubation, resulting in 68% death and 4% reported misplaced endotracheal intervention. Subsequently, inappropriate fluid resuscitation was reported in 54 patients and with subsequently 47 (87%) reported death. In rural areas, patients also did not receive IV fluids administration from PHC providers (McDermott et al., 2005). From 1994 – 2003, there were reported inadequacies in PHC management in five categories consisted of system deficiency, misdiagnosis, improper management, and intervention inadequacies (Boyle, 2009).

5.6 Evaluation of the triage decision

Triage is a rapid sorting of the patient to get the priority placement in treatment based on the severity. PHC triage decisions were determined based on patient assessment at field. However, triage decision approach may not be 100% accurate and error in triage was reported (Kilner, 2002). In this study, incorrect or error in triage decisions were reported. The final evaluation of the correctness of PHC triage decision is determined by the respective physicians and Emergency Medicine protocol. Result showed that 404 (94%) PHC providers were triaged appropriately. A total of 24 (6%) patients had error triage and an error occurred by both under of over triaging. It has been similarly reported in other studies. Kilner, (2002) reported, 2.7% over triage and 2.4% among PHC providers contributed to the error in triaging when compared with physician triage. In order to minimize error in triage decision, experiences, knowledge and training play a crucial role. There were significant increment in correct triage decision for those who had training in triage decision making (Kilner & Hall, 2005).

5.7 Relationship between year of experiences and PHC triage decision

Triage decisions are fundamentally based on the severity and critical in determining priority in emergency care. Thus, precision in triage decision is a vital factor that influence patient outcome. Knowledge and experience in clinical setting are main factors that influence correct triage decisions (Considine et al., 2007).

In this study, majority of PHC providers i.e. 94%, were able to carry out the triage decisions correctly. However, results indicated there were no significant differences between years of working experiences with triage decision. It was supported by Considine et al. (2007) who showed no significant relationship between years of experiences and triage decision. In addition, role of knowledge plays the vital factor that influence triage decision compared to experience. Similarly, Jelinek and Little (1996) found that nurse experiences are not affected in triage decision. In contrast, in Indonesia, there were weak positive correlations between year of experiences with triage decision (Fathoni, Sangchan, & Songwatthana, 2010). In addition, Goransson, et al. (2006) reported experience and triage decision as having significant relationship.

5.8 Relationship between Glasgow Coma Scale (GCS) and PHC triage decision.

Many studies indentified that levels of knowledge show an association with triage decision (Considine et al., 2007). It is similar in GCS score assessment in which PHC providers are required to use their knowledge and skill to determine severity of patient and the triage decision making. Error in GCS assessment may cause delay and inappropriate treatment. In this study, it is revealed that there were 111 (26%) omissions in GCS assessment. Chi square test show an association between GCS with PHC triage decision ($p \leq 0.05$). In Malaysia, GCS score is used to determine severity of patient and triage decision. No studies was found to use GCS score as assessment for triage decision in other county as they are practising Injury Severity Score (ISS) to determine injury severity. A study by Ashkenazi et al., (2006), where

used ISS to determine triage. Their studies found significant relationship between ISS and triage decision.

CONCLUSION

A total of 428 PHC records were selected, examined and analysed, and were compared and confirmed with physician reports for evaluation. The finding of this study found omissions occurred in assessment, documentation and intervention practice. The study also identified the inadequacies or inappropriate intervention practice implemented by the PHC providers of EDHKL. The study also showed the majority PHC providers were able to perform their triage decisions with correct classification of patients based on severity of injury. According to the data analysed, there was a statistically significant relationship between years of working experience and GCS identification, with triage decision.

CHAPTER 6

LIMITATIONS & RECOMMENDATION

6.1 Limitations

This study had some limitations. This study is limited to secondary data of PHC records with limited critical cases. Critical cases are needed to evaluate the ability of the PHC providers in assessing and implement intervention of the trauma cases. Moreover, the assessment and intervention as documented by PHC providers at EDHKL may not be generalised to all hospitals in the country. Moreover the final evaluation of PHC practice is limited to physician reports and emergency medicine protocol. In addition, physician reports of the Medical Officer are difficult to read due to poor hand writing. The potential bias may occur in this study because the personal information of PHC providers appear on the PHC record / sheet.

6.2 Recommendation

Based on this study, some recommendations can be made to reduce the omission in documentation and inadequacies intervention as practiced by the PHC providers. This study can also be used to improve the quality of the PHC services in HKL, and perhaps also in whole Malaysia.

PHC providers need at least 1 year clinical experience in emergency care and should be adequately trained before participating in PHC team service. The mentor mentee or tagging system must be practiced in PHC services to guide any new PHC personnel who do not have experience in PHC management.

PHC providers should be adequately trained. Thus, there should be designing of proper education and workshops to increase knowledge, skill and update of information. Evaluations the PHC providers' competencies have to be organized at least every six months to ensure PHC providers have improvements in their practice. In addition, to ensure that PHC document is completely documented, running assessment and routine checking by supervisor, physician of specialist is suggested.

Future study requires peer-group or committee team evaluation of PHC management. Peer-group evaluation plays an important role to discuss and evaluate adequate or inadequate assessment and intervention done by PHC providers. Peer-group evaluation included specialist, physician, supervisor, head nurse, senior AMO and SN.

Result from this study can be used to evaluate and review the current PHC service in Malaysia. The Ministry of Health (MOH) may design and introduce special courses and curricula which focus in PHC management and training such as Paramedic Course in diploma or degree level, as those which are currently being implemented in other countries e.g. Singapore, Australia, Japan and other.

REFERENCE

Ashkenazi, I., Kessel, B., Khashan, T., Haspel, J., Oren, M., Olsha, O., et al. (2006). Precision of in-hospital triage in mass-casualty incidents after terror attacks. *Prehospital and Disaster Medicine , 21* (1), 20-23.

Bavonratanavech, S. (2003). Trauma care systems in Thailand. *Injury*, *34*(9), 720-721.

Boyle, M. J. (2009). Comparison overview of prehospital errors involving road traffic fatalities in Victoria, Australia. *Prehospital and Disaster Medicine , 24* (3), 254-261.

Camp, L. V., & Yates, D. W. (2001). Trauma Scoring. In E. Soreide, & C. M. Grande, *Prehospital Trauma Care* (pp. 153 - 169). New York: ITACCS.

Considine, J., Botti, M., & Thomas, S. (2007). Do knowledge and experience have specific roles in triage decision-making? *Academic Emergency Medicine , 14* (8), 722-726.

Davis, D., Hoyt, D., & Ochs, M. (2003). The effect of paramedic rapid sequence intubation on outcome in patients with severe traumatic brain injury. *Journal of Trauma , 54* (3), 444 - 453.

Edwards, S. L. (2001). Using the Glasgow Coma Scale: analysis and limitations. *British Journal of Nursing , 2*, 92 - 101.

Fathoni, M., Sangchan, H., & Songwatthana, P. (2010). Triage skill and related factors among Emergency Nurses in East Java Province, Indonesia. *The 2nd International Conference on Humanities and Social Sciences* (pp. 1 - 11). Songkla: International Conference on Humanities and Social Sciences.

Guppy, L., & Wollard, M. (2000). Emergency ambulance service: Performance management and review. *Pre Hospital Emergency Care , 4*, 40 - 45.

Hatta, F. (2006). Study of accident, accident at curved road, on KM 38, Road FF23, Federal Road Muar. 1 - 100.

Hejar, A. R., & Rosnah, R. (2002). *Home injury: An overview.* Ministry of Health Malaysia.

Kene, M., & Davis, D. (2007). Airway management. In L. P. Ropplo, D. Davis, S. P. Kelly, & P. Rosen, *Emergency medicine hand book critical concepts for clinical practice* (pp. 25 - 44). Philadelphis: Mosby Elsevier.

Kilner, T. (2002). Triage decisions of prehospital emergency health care. *Emergency Medicine , 19* (1), 348–353.

Kilner, T., & Hall, F. J. (2005). Triage decisions of United Kingdom Police Firearms Officers using a multiple-casualty scenario paper exercise. *Prehospital and Disaster Medicine , 20* (1), 4-=46.

Kuan, L. (2007). The attitudes of road user and their relationship with involvement to road accident. A Case Study in Malacca. 1 - 66.

Lateef, F. (2006). The emergency medical services in Singapore. *Internasional EMS System , 68*, 323—328.

Laudermilch, D. J., Schiff, M. A., Nathens, A. B., & Rosengart, M. R. (2010). Lack of emergency medical services documentation is associated with poor patient outcomes: A validation of audit filters for prehospital trauma care. *Audit Filteres for Prehospital Trauma Care , 210* (2), 220 - 227.

Lockey, D. (2001). Prehospital trauma management. *Resuscitation , 48(1)*, 5 - 15.

Maier, R. V. (2001). Development and assessment of trauma system. *2nd Asian Conferences on Emergency Medicine* , (pp. 132-137). Taipei.

Mathew, P. (2001). Current controversies in prehospital trauma care. *2nd Asian Conference on Emergency Medicine*, (pp. 145 - 153). Taipei.

McDermott, F. T., Cooper, G. J., Hogan, P. L., Cordner, S. M., & Tremayne, A. B. (2005). Evaluation of the prehospital management of road traffic fatalities in Victoria, Australia. *Prehospital and Disaster Medicine , 20* (4), 219-227.

Mauger, J., & Deakin, C. D. (2001). Initial Assessment, Triage, and Basic and Advance Life Support. In E. Soreide, & C. M. Grande, *Prehospital Trauma Care* (pp. 181 - 203). New York: ITACCS.

Ministry of Health, Malaysia. (2007). *Emergency care standatd operating procedures for Assistant Medical Officer in emergency care.* Medical Assistant Board.

Mohd Shaharudin Shah Che Hamzah, R. A. (2005). Ambulance services at Hospital Universiti Sains Malaysia and Hospital Kota Bharu: A retrospective study of calls. *Malaysian Journal of Medical Sciences , 12* (2), 34 - 42.

Nik Hisamuddin, M. S. (2007). Prehospital emergency medical services in Malaysia. *International Emergency Medicine , 32* (4), 415–421.

Rittenberger, J. C., Beck, P. W., & Paris, P. M. (2005). Errors of omissionin the treatment of prehospital chest pain patients. *Prehospital Emergency Care , 9* (1), 2 -7.

Rottman, S. J., Schriger, D. L., Charlop, G., Salas, J. H., & Lee, S. (1997). On-line medical control versus protocol-based prehospital care. *Annals Of Emergency Medicine , 30* (1), 62 - 68.

Sethi, D., Aljunid, S., Saperi, S. B., Clemens, F., Hardy, P., Elbourne, D., et al. (2007). Comparison of the effectiveness of trauma services provided by secondary and tertiary Hospitals in Malaysia. *Annals of Emergency Medicine , 49* (1), 52 - 61.

Sloane, C. M., & Pessl, A. (2007). General approach to trauma. In L. P. Roppolo, D. Davis, S. P. Kelly, & P. Rosen, *Emergency medicine hand book critical concepts for clinical practice* (pp. 74 - 83). Philadelphia: Mosby Elsevier.

Smith, R., & Conn, A. (2009). Prehospital care - scoop and run or stay and play?. *Injury, 40* (4), S23-S26.

Strickler, J. (2010). Traumatic hypovolemic shock. *Lippincott Williams & Wilkins* , 34-39.

Strong, C., & Thompson, C. B. (2000). Documentation of decision-making during air transport. *Air Medical Journal , 19* (3), 77 - 82.

Sukumaran, S., Henry, J. M., Beard, D., Lawrenson, R., Gordon, M. W., O'Donnel, J. J., et al. (2005). Prehospital trauma management: a national study of paramedic activities. *Emergency Medicine , 22* (1), 60 - 63.

Tanigawa, K., & Tanaka, K. (2006). Emergency Medical Service System in Jappan: Past, Peresent, and Future. *Internasional EMS System , 69*, 365 - 370.

Venes, D. (2005). *Taber's cyclopedic medical dictionary* . Philadelphia: F.A Davis

Williams. (2007). Medication errors. *Royal College of Physicians of Edinburgh , 37*, 343–346.

Woodall, J., McCarthy, M., Johnston, T., Tippet, V., & Bonham, R. (2007). Impact of advanced cardiac life support-skilled paramedics on survival from out-of-hospital cardiac arrest in a statewide emergency medical service arrest in a statewide emergency medical service. *Emergency Medicine , 10* (1), 134 - 138.

Appendix I Approval Letter from Research Committee University Putra Malaysia

Appendix II Letter to Hospital Kuala Lumpur

Appendix III Investigator's Agreement, Head of Department and Institution Approval

Appendix IV Research Submission

Research Submission

Date Printed : 29-12-2011 09:48:19

ResearchID :	10591
Research Title :	Evaluation of the Early Assessment and Intervention among Pre-hospital Care Providers in Trauma Cases from Emergency Department Hospital Kuala Lumpur
Research Abbreviation :	Evaluation of the Early Assessment and Intervention among PHC in Trauma Cases from EDHKL
Approval Type :	Research Registration & Notification

Built PDF By : SHAHRUL AZHAR BIN MOHD AZNAN

Built PDF Date : 29-12-2011 09:48:19

Research Details

Date Printed : 29-12-2011 09:48:19

ResearchID : 10591

Correspondence Person : SHAHRUL AZHAR BIN MOHD AZNAN

Evaluation of the Early Assessment and Intervention among Pre-hospital Care Providers in Trauma Cases from Emergency Department Hospital Kuala Lumpur

1.2. Title abbreviate : Evaluation of the Early Assessment and Intervention among PHC in Trauma Cases from EDHKL

1.3. Collaborative research :

- [x] This is NOT a collaborative work with any of the NIH institutes
- [ ] Clinical Research Centre (CRC)
- [ ] Institute for Medical Research (IMR)
- [ ] Institute of Public Health (IPH)
- [ ] Institute for Health Management (IHM)
- [ ] Institute for Health Systems Research (IHSR)
- [ ] Institute for Health Behavioural Research (IHBR)

1.4. Submission purpose :

Institute for Health Behavioural Research (IHBR)

IRB/IEC Medical Research Ethics Committee (MREC)

Research Registration

2.1. Protocol ID :

2.2.1. Student Academic Project : Bachelor

2.2.2. Student Academic Project Specify :

2.3. Research Type : Health Social Science / Behavioral

2.4. Clinical Research Sub Type :

Clinical Research

3.0.1. Research Purpose : To evaluate early assessment and intervention in trauma cases responded by pre-hospital care providers Emergency Department Hospital Kuala Lumpur (EDHKL).

3.0.2. Research Description :

INTRODUCTION

Pre-hospital care service in Malaysia is still relatively new and it is slowly developing for the last 5 years (Hisamuddin et al., 2006). However there is no clear instruction regarding pre-hospital care service in Malaysia (Ministry of Health, Malaysia, 2007). With increasing numbers of road traffic accidents and other emergency situations the demand from public requires the best pre-hospital care services. Death and disability due to injury or trauma is among the top 10 causes of death in low and middle income countries, and 90% road traffic accidents contributed to the major cause of death (Sethi et al. 2007). Lockey (2001) reported that trauma cases need rapid assessment and intervention as the mortality and morbidity incidence depend on pre-hospital care service provider. Thus, pre hospital care play an important role on offering the best patient outcome. Pre-hospital care service is a system that was designed to facilitate an efficient and better emergency medicine. Rottman et al., (1997) report that 15% of chest pain patients received improper treatment. It include wrong of assessment, intervention and lack of documentation. The quality of pre-hospital care can be evaluated in several methods. Guppy & Wollard (2000) investigated the entire progression of pre-hospital care as it is a key to measure efficiency of the service.

METHODOLOGY

A cross sectional using secondary data will be retrieved from patient records at Emergency Department Hospital Kuala Lumpur. All trauma cases responded by pre-hospital care Emergency Department Hospital Kuala Lumpur during 1 Jan 2010 until 31 December 2011 will be considered. Inclusion criteria will be imposedfor this study. A random sampling method will be used. All trauma cases will be examined and those

3.0.2. Research Description : which fulfil the exclusion criteria will be removed from sample pool. Each record will be numbered and the fifth one will be selected to represent the sample. A data collection instrument proforma was designed to collect data from standard sheet used by the pre -hospital care provider at Emergency Department Hospital Kuala Lumpur. The contents for these data collections include section A: Crew, respond time and trauma type, section B: Assessment, Section C: Intervention, section D triage and Section E: physicians report. The Cochran (1963) formula n = (Z2 PQ)/ e2 was used to estimation sample size (432 records). Data will be analysis by using Statistic Package for Social Science (SPSS) version 17. Analyzing of frequency, percentage and standard deviation will done using descriptive analysis. Chi-square test will be used to determine relationship between dependant variable and independent variable. P value of < 0.05 will be consideredas statistically significant. Ethical approval will be obtained from Ethic commnittee Faculty of Medicine and Health Sciences, Universiti Putra Malaysia and Medical Research Ethics Committee Ministry of Health, Malaysia.

3.0.3. Keywords : Pre-hospital

3.0.4. Research Date Start : 15/01/2012 **3.0.5. Research Date Completed :** 02/05/2012

3.0.6. Research Duration (months) : 4.0

3.0.7. LinkURL :

3.0.8. Recruitment Status : Not yet recruiting

3.0.9. Condition : Trauma Cases

3.0.10. Age Limit : ▩ **3.0.10.1. Not Available - Not Applicable** **3.0.10.2. Age Limit Min :** 1.0

3.0.10.3. Age Limit Max 99.0

3.0.11. Gender : Both

3.0.12. Eligibility : Inclusion Criteria
Trauma cases record responded by pre-hospital care EDHKL
Trauma cases record for Malaysian and non Malaysian resident.

Exclusion Criteria
Trauma case death at location.

3.0.13. Acceptable Participant : No

3.0.14. Target No Subject - All / Msian : 423 / 423

3.0.15. Target Number Subject in Malaysia : **1.Total in number :** 423
2.Number by site in text: 423 X 1

Clinical Trial

3.1.1. Study Phase :

3.1.2. Purpose :

3.1.3. Allocation :

3.1.4. Masking :

3.1.5. Control :

3.1.6. Assignment :

3.1.7. Endpoint :

3.1.8.1. OutcomeMeasure Primary :

3.1.8.2. OutcomeMeasure Secondary :

3.1.9.1. Name of intervention under investigation :

3.1.9.2 Intervention Type :

3.1.10. Therapy Area :

Observational Study

3.2.1.1. Disease Area :

3.2.1.2. Disease Area Specific Disease :

3.2.1.3.Disease Area Other Specify :

3.2.2. Purpose :

3.2.3. Selection :

3.2.4. Duration :

3.2.5. Timing :

Appendix V National Institute of Health Approval for Conducting Research in the Ministry of Malaysia

Appendix V National Institute of Health Approval for Conducting Research in the Ministry of Malaysia

Appendix VI Approval Letter from Medical ethical The Ministry of Health Malaysia

NATIONAL INSTITUTES OF HEALTH APPROVAL FOR CONDUCTING RESEARCH IN THE MINISTRY OF HEALTH MALAYSIA

PENGESAHAN INSTITUSI PENYELIDIKAN NEGARA UNTUK MENJALANKAN PENYELIDIKAN DI KEMENTERIAN KESIHATAN

This is an auto computer - generated document.It is issued by one of the research institute under the National Institutes of Health (NIH). These are the Institute for Medical Research (IMR), Clinical Research Centre (CRC), Institute of Public Health (IPH), Institute for Health Management (IHM), Institute for Health Systems Research (IHSR), and Institute for Health Behavioural Research (IHBR)

Dokumen ini adalah cetakan berkomputer. Borang ini dikeluarkan oleh salah satu institusi dibawah National Institutes of Health (NIH) iaitu Institut Penyelidikan Perubatan (IMR), Pusat Penyelidikan Klinikal (CRC), Institut Kesihatan Umum (IKU), Institut Pengurusan Kesihatan (IPK), Institut Pergurusan Sistem Kesihatan (IPSK), Institut Penyelidikan Tingkahlaku Kesihatan (IPTK)

Unique NMRR Registration ID : [Nombor Pendaftaran]	NMRR-11-901-10591
Research Title : [Tajuk]	Evaluation of the Early Assessment and Intervention among Pre-hospital Care Providers in Trauma Cases from Emergency Department Hospital Kuala Lumpur
Protocol Number if available : [Nombor Protokol jika ada]	

#	**Investigator Name** [Name Penyelidik]	**Institution Name** [Nama Institusi]
1	SHAHRUL AZHAR BIN MOHD AZNAN	Kuala Lumpur Hospital

I have reviewed the above titled research, and approve of its design and conduct.

Saya telah menyemak kajian yang bertajuk seperti di atas dan meluluskan rekabentuk dan perlaksanaannya.

Name of Director : *[Nama Pengarah]*	Pn. Siti Sa'adiah Hassan Nudin
NIH Institute (IMR, CRC, IPH, IHM, IHSR and IHBR) *[Nama Institusi di bawah NIH]*	Institute for Health Behavioural Research (IHBR)
Signature & Official stamp : *[Tandatangan dan Cop Rasmi]*	This is computer generated document, therefore no signature is required.
Date : *[Tarikh]*	18-01-2012

(Note: This is a computer generated document. It may not carry any signature)

Appendix VII Data collection instrument – proforma

Data Collection Instrument Question

Study Number:

Section A: Professional Status
Will fulfil by researcher into proforma

Section B: Assessment (Yes or No indicates whether documented)

1. Consciousness level :

   ◯ Yes ◯ No

2. Airway:

   ◯ Yes ◯ No

3. Speech Quality:

   ◯ Yes ◯ No

4. GSC Score:

   ◯ Yes ◯ No

Section C: Intervention (indicates whether Correct or Incorrect/inappropriate in intervention practice)

1. Airway:

   ◯ Correct ◯ Incorrect / inappropriate :

2. Breathing:

   ◯ Correct ◯ Incorrect / inappropriate

3. Circulation:

   ◯ Correct ◯ Incorrect / inappropriate

4. Immobilization:

   ◯ Correct ◯ Incorrect / inappropriate

5. Haemorrhage Control:

   ◯ Correct ◯ Incorrect / inappropriate

Section D: Pre-hospital Care Triage (indicates whether Correct or Incorrect)

1. Pre-hospital care Triage:

   ◯ Correct ◯ Incorrect

Adapted from Rittenberged et al., (2005)

Data Collection Instrument

Study Number	Reviewer

SECTION A

1. Team Leader: ☐ AMO ☐ SN
2. Service Background:
   a) Year of experience: ☐ 1 – 5 ☐ 6 – 10 ☐ > 10
   b) Post Basic Training: ☐ Yes ☐ No
   c) PHC Course Training Locally: ☐ Yes ☐ No
3. Respond Time:
4. Trauma Type: ☐ Home ☐ Road ☐ Industrial
5. Chief Complaint:

SECTION B (Assessment): Compulsory to fill by PHC

1. Consciousness Level : ☐ Alert ☐ Verbal ☐ Pain ☐ Unresponsive ☐ Omission
2. Airway : ☐ Patent / Speaking ☐ Snoring ☐ Gurgling ☐ Unsure ☐ Omission
3. Speech Quality : ☐ No Speech ☐ Orientated ☐ Confused ☐ Unsure ☐ Omission
4. GSC Score :

SECTION C (Intervention): Correct Intervention according to Emergency Medicine Protocol

1. Airway : ☐ Non Required ☐ Nasopharyngel Airway ☐ Oropharyngeal Airway
   ☐ Manual positioning ☐ LMA ☐ ETT ☐ Inadequacies

2. Breathing ☐ No Oxygen Required ☐ Nasal Prong ☐ High Flow Mask ☐ Bag Ventilation
   ☐ Inadequacies

3. Circulation ☐ No Intervention Required ☐ IV Cannula ☐ IV Drip ☐ Inadequacies

4. Immobilization ☐ None Required ☐ Cervical Collar ☐ Spine Board ☐ Pelvic
   ☐ Upper Limb ☐ Lower Limb ☐ Traction Splint ☐ Inadequacies

5. Haemorrhage Control ☐ None Required ☐ Gauze ☐ Bandage Compression
   ☐ Torniquet ☐ Haemostatic Sutures ☐ Inadequacies

SECTION D

1. Pre-hospital Care Triage: ☐ Green ☐ Yellow ☐ Red

SECTION E: Medical report to be used to clarified intervention and triage by pre-hospital care providers

Consciousness Level :

Airway :

Breathing :

Circulation :

Immobilization :

Haemorrhage Control :