CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

In this chapter, the presentation focuses on the relevant and significant findings. Suggestions and implementation are likewise, discussed. The recommendations include the needs for a development of a new guideline in management of PICH, demand for the development of acute inpatient rehabilitation setting for PICH patients with neurological and functional deficits, a multidisciplinary involvement in the management of PICH patients in the rehabilitation phase, providing educational and training for patients and family or caregivers, encouragement of patients and caregivers participation in care during inpatient setting, public education related to PICH and prevention strategies related to PICH, as well as life-long learning strategies for other health care providers regarding PICH and research recommendations.

Majority of the patients were men and their mean (SD) age was 55.0 (11.8) years, almost half received education until primary school and or no formal education. Slightly over half of the patients did not have specific jobs and were classified under low social-economic status or poor. Majority of the patients received support from their spouses or from their children, most were smokers and hypertensive. Basal ganglia was the most common area of bleeding followed by bleeding in thalamic and lobar area in the brain.

Five predictors significantly associated with early adaptation; sex (females), location of brain lesion, neurological deficit score, respiratory infection and lower stroke knowledge score which contributed 52.0% of the variance affecting patient ability to adapt with stroke-related disability during acute inpatient rehabilitation. Among female
patients, having ICH in the lobar area, having a higher neurological deficit score, and possessing limited stroke knowledge were predictors of factors affecting the early adaptation of patients to the sudden disability attributed to PICH.

Meanwhile, at three-month post PICH, six predictor; age ($\beta = -0.82$, $p < 0.001$), early functional adaptation score, stroke knowledge, no urinary infection at three-months post PICH, no experiencing depression at three-months post PICH, and ICH treatment were associated with later functional adaptation accounting to 65 percent ($R^2=.65$) of the variance. Later at 3 months, older age, lower degree of functional adaptation at the acute phase, lack of compliance to ICH treatment, exposure to respiratory infection, exposure to urinary infection, bedsores at the acute stage and later at three months post PICH, experience of depression at three months post PICH, and limited stroke knowledge were predictors of negative long-term adaptation outcomes at home.

In Malaysia, there has been limited evidence regarding problems of patients with intracerebral haemorrhage and factors affecting adaptation outcomes. In this country, importance of immediate action for patients exhibiting signs and symptoms of intracerebral haemorrhage is commonly underestimated, particularly at government hospitals. There is also inadequate evidence exists to guide the development of a standard of care to a patient with stroke related to intra-cerebral haemorrhage starting from the hospital setting until the rehabilitation phase at home.

### 6.2 Recommendations

By understanding the factors that positively or negatively affect early adaptation in responding to stroke-related disabilities and outcomes at three months after living with disabilities, nursing professionals will be able to improve their understanding of
problems related to PICH. Therefore, they can contribute to the redevelopment of nursing strategies in preparation for patient discharge from acute recovery care, and they can prepare for involvement in the provision of nursing care management after discharge at home and in the community.

The findings from this study provide some evidence of the factors that positively and negatively affect the ability of PICH patients to adapt to stroke disability. The findings have several important implications for health care professionals (e.g. medicine, nursing, psychology, and physiotherapy), the haemorrhagic stroke literature, and the Malaysian health care system.

6.2.1 The need of a comprehensive neurology inpatient rehabilitation care setting for PICH patients with neurological and functional deficits

In relation to gaining the maximum functional adaptation in the early phase post PICH, recovery to the maximum functional ability and prevention post stroke complications, the researcher suggests a provision of early rehabilitation management for neurological deficits. Researcher strongly suggests to the health-care professional in the health care sector that there is a need of a comprehensive neurology inpatient rehabilitation care setting at all hospitals setting in Malaysia. A comprehensive neurology inpatient rehabilitation care setting is required to help PICH patients and their families and caregivers during the early phase and long-term post PICH. The service should be well-organized, multidisciplinary inpatient (stroke unit) care and have attention to further this rehabilitation service in the community. As suggested by Vanhook (2009) and the World Health Organisation (WHO, 2010), the objective of acute rehabilitation for patients with ICH is to ensure that these patients can discharge earlier with minimal
disability and adapt to stroke deficits, including those related to cognition and functional abilities.

The management of the acute inpatient rehabilitation of PICH patients in Malaysian hospitals should emphasize the use of standard assessment criteria to determine the severity of stroke illness, adopt specific therapeutic care to prevent the development of post-stroke complications, facilitate rehabilitation therapy, provide good support for female stroke patients, encourage patients’ and caregivers’ participation in care management, and prioritize patient and family/caregiver education regarding stroke illness and prevention of recurrent of stroke. During early phase, rehabilitation was instituted and continued until long term. Thus, this confirmation of rehabilitation helped in their adaptation.

6.2.2 The need of development of a new guidelines in nursing management of PICH

Nursing management of a patient in acute inpatient rehabilitation setting should apply a specific or standard guideline. The important nursing intervention for PICH patients is to enhance recovery of neurological deficit, to prevent post stroke complications, provide therapeutic care, started early rehabilitation nursing care, encourage mobilization and participation in self-care activities, and also provide psychosocial support to the patient and family. Miller (2010) and Duncan (2005), Long et al., (2002) stated that nursing rehabilitation management of PICH patients, including assessment of patient's needs and risks, rehabilitation therapy, co-ordination and communication patient’s family, emotional support and caregiver's involvement.
Nursing care professionals, who are involved in healthcare planning and strategies, should consider planning and developing a standard guideline of specific nursing rehabilitation treatment and care for PICH patients. Guidelines must be purposely developed to prevent recurrent hypertensive crisis, recurrent PICH and stroke, and post stroke complications, as well as to improve recovery and functional abilities, provide stroke-specific education related to PICH for patients and their caregivers, encourage family participation and support, and enhance the health and quality of life of PICH patients after discharge from the hospital setting. This guideline should be implemented in all hospitals setting in Malaysia that provides care for PICH patients. The content of a new guideline for inpatient rehabilitation care should include (a) an assessment to determine the severity of PICH illness, (b) therapeutic care for the prevention post-stroke complications, (c) rehabilitation therapy for patients with neurological and functional deficits, (d) encouragement of patients’ and caregivers’ participation in care and (e) patient and family/caregiver education.

6.2.2.1 Assessment to determine the severity of stroke illness

The focus of care during for PICH patients include to do assessment and focus on re-achieving of neurological deficit such as facial palsy, dysphagia, motor function of arms and leg at any side and communication problems, and also adapt with stroke-related disability. Care for patients with PICH includes assessment of the need to continue treatment, care and rehabilitation before discharge. The assessment for stroke patients with PICH should be done on admission and on a regular basis while in hospital and, possibly, after being discharged. The assessment data should be used as a guideline for rehabilitation planning with the involvement of the interdisciplinary team. The assessment includes the severity of neurological deficit using a standard assessment tool.
such as NIHSS, assessing the degree of limitation or inability to perform functional activities using a standard functional assessment tool such as FIM to determine the degree of patient ability to perform self-care activities, ability to do self-management of bowel and bladder control, moving, handling and transfer and in cognitive function such as to communicate, and to perform social interaction.

Patients with PICH should be assessed whether they have family and social support, specific treatment, psychological status, nutrition status, or any other potential for post stroke complications such as respiratory infection, urinary tract infection, pressure sores of immobility-related complications and depression such as pain, wound and urinary infections, respiratory infection, pressure sores and DVT.

Thus, a standard assessment checklist should be used to determine the severity of neurological deficits in areas such as the motor, sensory, cognitive, communication, and swallowing aspects related to PICH; the alteration of functional ability; risk of post stroke infections; and any limitation in involving in a psychosocial activity immediately after PICH. Patients should also be assessed for depression. The standard assessment tools include the NIHSS for the status of neurological deficit, FIM for the level of disabilities and dependence, complication status checklist for complications, and PHQ nine-item questionnaire for depression. In the inpatient rehabilitation setting, a standard tool should be used to manage patients with PICH. Future research could address the usefulness of the components of FIM scores to aid in discharge planning for the midrange group, the development of clinical pathways that would assist in discharge planning, and the monitoring of patient progress with particular attention to the group of patients with scores in the 40 to 79 midrange.
6.2.2.2 Nursing rehabilitation therapy

Based on the finding, it is found that female gender, location of brain lesion, severity of neurological deficit due to PICH, complication, there are a respiratory infection and lower knowledge of stroke of patients and their caregivers are predictors of lower functional adaptation during early recovery phase. It is important for stroke rehabilitation nursing care to reinforce the most important issues, which are to prevent recurrent stroke, ensure proper management of general health functions, mobilize the patient, encourage resumption of self-care activities and provide emotional support to the patients and their families. In relation to gain maximum functional outcome, to adapt, recover to the maximum functional ability and prevent post stroke complications. Researchers suggest providing early rehabilitation management, suppose immediately after determine the problems.

It is important to have a standard guideline in providing specific rehabilitation care for PICH patients such as a proper management of hypertension crisis, neurological deficit, stroke functional disability, problem's impact from immobility. Patients are encouraged to start as soon as possible for an early rehabilitation program in order to facilitate recovery and gain adaptation, and provide family and community support to the patient and family.

Specific nursing care related to haemorrhagic stroke such as nutritional support, administration of medication, wound care and infection prevention. Physical care such as to help patients to perform self-care activities, including bathing, dressing and clean body. The physical care during inpatient rehabilitation phase includes care for patient with altered consciousness, dysphagia, skin care and risk for skin break, bowel and bladder care, shoulder pain, immobility and deep-vein thrombosis.
As mentioned before, post stroke complication is important predictors that influence adaptation and should be taken a full consideration. This factor should be used as strategies to prevent more patient having post stroke complications, or patient might die. It is important to minimize stroke-related disability, minimize potential risk of recurrent stroke due to the hypertension crisis, prevent post stroke complications such as infections, whether respiratory, skin or urinary system, immobility problems such as shoulder pain, fall and skin break, psychological problems such as anxiety, emotional or depression during early phase post PICH. So it is important to highlight that as soon as the patient (young age, female) admitted due to PICH, they should give specific treatment and care and can recover without development of post stroke complication. It is because; if we not treat them according to specific need the patient may be dying due to complications.

In three months after PICH, the finding of this study showed that patients who gained positive adaptation or better stroke outcome are among young age, good functional status during initial admission, have good stroke knowledge during early recovery phase, no evidence of infections such as urinary tract infection or respiratory infection or depression and received ICH treatments. So, it is important to ensure that the patients who survive from critical condition should encourage to continue rehabilitation therapy at home to enhance adaptation to motor dysfunction. The patient should be encouraged to engage in motor therapies to improve upper and lower function deficits. For lower and motor dysfunction, motor function therapy, including ROM exercise or repetitive movement of the lower or upper limbs, must be encouraged. Another method that can be used is a massage of the body area, especially the patient’s back and extremities, to prevent permanent disabilities and bedsores. A stroke patient

223
should be mobilized from a bed to a chair or vice versa using the correct transfer techniques and by employing a wheelchair.

6.2.2.3 Therapeutic care

In relation to prevent secondary disability, researcher recommend in providing a comprehensive encouragement for functional independence and to improve better adaptation with stroke disabilities. The nurse should create an environment in which is conducive for therapeutic care and collaboration with the therapist (physiotherapists and occupational) and gain client's new abilities into activities of living in relation to enhance recovery and rehabilitation outcome. In relation to improve health-care professional, knowledge of care of patients with ICH researcher strongly recommends that they should be given adequate knowledge and training by encourage continuing education for who need to change roles and responsibilities in haemorrhagic stroke rehabilitation.

In managing PICH patient in the post-acute inpatient rehabilitation setting, healthcare professionals should apply a specific guideline appropriate for ICH in relation to the enhancement of recovery from neurological deficits, prevention of post-stroke complications, provision of therapeutic care, initiation of early rehabilitation nursing care, encouragement in mobilization and participation in self-care activities and provision of psychosocial support for the patients and their families. Adequate evidence must be provided to guide the development of a standard of care for patients with stroke related to intra-cerebral haemorrhage, starting from the hospital setting until the rehabilitation phase at home.
6.2.2.4 The need for multidisciplinary involvement

There is the need of a multidisciplinary involvement (e.g. medicine, nursing, psychology, physiotherapists and occupational) and other health practitioners in providing a therapeutic care and rehabilitation that focus on post stroke disability related to PICH and emphasize also to trains and educate the caregivers. It is essential to recognize the importance of interdisciplinary collaboration input 24 hours a day for PICH patients in order to achieve the target to lower the rate of mortality, minimize permanent disability, as well as to gain the maximum functional outcome and returned home as early as possible without major dependence for health care facilities. So there is the need of development of the guideline of rehabilitation with multidisciplinary involvement with the goal to enhance better recovery and adaptation.

6.2.2.5 Providing patient and their caregivers educational and training

The finding revealed that during acute inpatient recovery phase, PICH patients’ and their caregiver had lower stroke knowledge regarding their illness, preventive strategies toward recurrent ICH or stroke, post stroke complications and depression. In relation to the finding, the patients and caregiver should be encouraged to be more active in seeking more information and learning opportunities to develop their expertise in this approach.

There is a need for an appropriate educational programme for PICH patient and their family caregivers. Health care professionals (nurse and physician) in the hospital setting need to participate in providing education to patient and their family in relation to ensure that stroke patients, and their caregivers have adequate stroke knowledge before discharge from the hospital setting. The researcher strongly suggested that the
stroke rehabilitation care for PICH and stroke patients generally should include education for patient and caregivers. Rehabilitation programmes should further create awareness about recurrent stroke and post-stroke complications, and give information about secondary stroke prevention, lifestyle changes, emotional and stress management and caregiver strategies to prevent feelings of being burdened by the disease.

The patients and caregiver should provide information regarding haemorrhagic stroke and care needs. Professional nursing and nurses are encouraged to develop specific ICH educational program to stroke patient and their family carer. The content of stroke knowledge or information includes information regarding stroke symptom, risk factor, how to deal with signs of problems or recurrent stroke, management of depression and how to manage disease, symptom and related problems.

Nursing rehabilitation programs should provide awareness about recurrent ICH and post stroke complication, give information about secondary stroke prevention, change usual lifestyle, emotional and stress management, provide caregiver strategies to prevent a burden. In order to prevent post stroke complication, sudden hypertensive crisis, recurrent stroke and to enhance quality of life of ICH stroke patient and their caregivers, professional health care providers should ensure that stroke patient and caregiver should have adequate stroke knowledge before discharge from hospital setting.

They should be given advice that regular health checkup is important in preventing emergency hypertensive crisis, recurrent stroke and depression. PICH patients and their caregiver should be more active in seeking more information and learning opportunities to develop their expertise in this approach. PICH patients and their caregivers should be given information related to stroke symptom, risk factor, how to deal with signs of
problems or recurrent stroke, management of depression, to manage disease and symptom. To ensure these strategies is effective;

6.2.2.6 Encouragement of patients and caregivers’ participation in care

To improve early adaptation to stroke disability, which is, PICH patients should be given good support from family and caregivers. Patients and their caregivers are encouraged to participate aggressively in rehabilitation as early as possible to promote early recovery for the identified area to achieve better long-term stroke recovery outcomes. Information regarding haemorrhagic stroke and care needs should be provided to stroke patients and their caregivers. During inpatient stroke rehabilitation care, patients and family caregivers, especially spouses are encouraged to participate in self-care and mobility, treatment, care, and rehabilitation needs upon the patients’ discharge from the inpatient setting. Spouses or significant others ought to be involved in care, decision making related to treatment and rehabilitation plan for patients, if available, throughout the acute recovery and rehabilitation process. Psychosocial and spiritual supports are warranted. Healthcare providers who are caring for patients with PICH should be provided with new and updated information related to stroke and resource availability.

6.3.3 Public education related to PICH and prevention of PICH

Based on the findings from this study, it is important for the aggressive campaign in the community regarding what is PICH and also strategies to prevent the occurring of PICH among individuals with hypertension by emphasize adherence to hypertension drug. The PICH stroke patients are reinforced to aware with the preventive survival strategies
provided in our country, which include regular health check-ups to prevent emergency hypertensive crises, recurrent stroke, depression, and post-stroke complications, as well as compliance with the medication suggested by the physician and adherence to the suggested social welfare and rehabilitation programme.

In relation to improve nurse’s knowledge in care for patients with ICH researcher strongly recommend that they should be given adequate knowledge and training by encouraging continuing education for who need to change roles and responsibilities in haemorrhagic stroke rehabilitation. Nursing education should prepare an established educational program for professionals, nurses and other’s healthcare provider to address the efficacy of rehabilitation for patients with ICH.

### 6.3.4 Lifelong learning for health-care professional

As for healthcare professionals, further continuing professional education is needed, particularly in terms of their responsibilities in haemorrhagic stroke rehabilitation, to enhance their knowledge in caring of patients with ICH.

### 6.3.5 Health Research Recommendations

Several areas of future research are related to the care of patients with PICH. Future studies can begin by developing a rehabilitation nursing care management guideline in the country in relation to improving recovery, functional independence, and long-term outcomes of patients with PICH. Studies should focus on the identification of the effectiveness and appropriateness of nursing rehabilitation intervention specific for PICH or haemorrhagic stroke patients related to treatment; therapeutic nursing care to promote nutrition, recovery from neurological deficits, self-care in activities,
intervention to enhance independence to participate in activities, information and educational, rehabilitation training and care in relation to the prevention of post-stroke complications and depression. Other studies should emphasize the recovery of motor, language and cognitive function among patients with ICH.

6.4 Limitations of the Study

The study is not without its limitations. First, this study utilized 113 samples, obtained from Hospital USM and Hospital SNZKT. The reasons for small sample size were due to the actual population for PICH, which was limited compared with other types of stroke, its account able for 10% from the total population of stroke per year. However, to ensure adequate patients for this study we conducted at two hospitals at Kelantan and Terengganu Malaysia. Both hospitals are stroke haemorrhagic referral hospital in Kelantan and Terengganu. Further to ensure adequate sample size, the time of data collection was extended from one year to 1 and half year. Even, during the phase 1 of data collection, the sample was 147 however, during follow up at three months, 26 out of 147 were excluded because of dead in between 2 week to three months and 8 cohorts were missing, so the total patients for data analysis was 113 patients.

The second limitation is the requirement of more rigorous translation of tools with the content validity being measured, and the content validity index (CVI) documented properly. Other types of validity could be followed up. The factor analysis could be performed with adequate samples size. Therefore, to have appropriate adequate translation of questionnaires, it is done by follows the step suggested by (Sousa & Rojjanasrirat, 2014 or Mapi).
The third limitation of this study is the requirement of a valid, efficient and reliable measure of patients’ neurological status and outcome. The use of National Institutes of Health Stroke Scale (NIHSS) for measuring the neurological status should be applied with the proper procedures. Schmulling (1998), suggested that to use NIHSS tool, the assessor should have adequate training and required to be certified. In this study, the NIHSS was modified, which is the item 7 ataxia, were removed from the scale. The maximum possible score with the use of this simplified scale is 40, compared with 42 for the original scale. The modified NIHSS with 14 items is primarily decided based on the finding of the pilot study of this study that suggested of removal item ataxia in order to prevent poor agreement of the score between assessors. The poor agreement usually because of the condition of the PICH patients during early phase post PICH. The other reason for excluding ataxia item is to maintain reliability and consistency of the scoring. The exclusion of the item ataxia is primarily developed for this study and to make it simpler and easier to perform the assessment for the PICH patient with poor awareness and having hemiparesis.

Thus, if decide to use NIHSS, the future researcher should consider obtaining a systematic training and knowledge of detailed instruction before started data collection. Another tool is Functional Independence Measure (FIM) tool also need certification via online video. Results of early FIM score (baseline) need to be interpreted with caution because of high SD, and future studies are suggested on a larger sample size.

The following limitation of this study is related to studying design and data collection. The data collection utilized using questionnaires, structure interview, physical examination, use of laboratory result and medical chart. The original data was designed to be done at 2 week for early phase and later at six months to see the predictable
outcomes; however, it was change based on the results of pilot the study where it was felt that the data collection for PICH patients should be done just before discharge and at three-month post PICH. This decision was supported by previous study stated that recovery of PICH patient faster compared to other types of stroke (Oh & Seo, 2010, Leung 2010, Bahao, 2009) and possibility of missing sample is high. This approach was taken to avoid the probability of missing data, which was higher at six months. Therefore, to prevent selection bias that may occur, during identification of the study subjects (samples), the inclusion criterion for study population is clearly defined, accessible at two hospitals, reliable and increased risk to find the outcome of interest. Luckily, this study is a prospective study (cohort) when the outcome is unknown at time of enrolment is less prone to selection bias.

Another limitation of this study is related to patients who were died at follow up (three months) were dropped from the list, and this might bias the result in adaptation. Ideally, the patients who died after they were selected in phase I, they should be included in data analysis intention to treat and to provide a true picture of PICH patients.

The last limitation of this study is the protocol for data collection done by researcher herself with the reason to minimize the inter-observer variability when multiple individuals gathered and entered the data. Therefore, to decrease bias, it is better to have a different individual to measure the outcome (three months at patient’s home) rather than used those who assessed the during the early phase of data collection. Another limitation related to data collection is during phase two is the interview took up to one hour per patient may result in exhaustion on patients. Interviews should be done in shorter time.
Summary

In planning to develop a specific programme for haemorrhagic stroke patients, especially for PICH, evidence from this study's findings was presented with the recommendations. However, subsequent research will focus on developing specific rehabilitation nursing interventions for PICH patients and specific educational intervention programmes related to PICH illness, care needed and therapeutic intervention to enhance recovery and prevent post-stroke complications.