AWARENESS AND RESPONSES TOWARDS THE SIGNS AND SYMPTOMS OF HEART ATTACK AND STROKE AMONG THE LAY PUBLIC OF KUANTAN, PAHANG, MALAYSIA

BY

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A thesis submitted in fulfilment of the requirement for the degree of Master in Pharmaceutical Sciences
(Pharmacy Practice)

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FEBRUARY 2020

ABSTRACT

Coronary heart disease (CHD) and stroke are the major causes of mortality in Malaysia. According to the WHO, the mortality rate of CHD within Malaysia is increasing and was responsible for 23.10% of total deaths in 2014. The high rate of mortality due to heart attack and stroke is attributed to lack of awareness towards their signs and symptoms. Therefore, this study aimed to assess the awareness and response towards signs, symptoms and risk factors of HA and stroke among the general population at Kuantan, Pahang, Malaysia. A cross-sectional study was conducted via structured questionnaire survey among 393 participants in Kuantan city who were between 18-64 years of age. Majority of the respondents recognised chest pain as heart attack symptoms (HAS) followed by 68.1% sudden shortness of breath. Only 35.6% of respondents reported suitable action towards HAS. About 81.9% knew at least one HAS while 10% of them did not know any HAS. Approximately 11.5% of participants identified all five HAS and 5.6% of participants recognised all the five HAS and appropriate action (calling an ambulance). Multivariable logistic regression showed that single participants were more aware of all 5 HAS than other marital statuses (p=0.023, OR=0.023, 95% Cl=0.001-0.594). Malay participants were more likely to recognise all the 5 HAS than other race (p=0.004, OR=0.376, 95% Cl=0.193-0.773). Respondents with family history of HA, those who had received information about HA and those who were aware that HA needs urgent treatment showed more awareness on all 5 HAS than others without those conditions (p=0.055, OR=2.206, 95% Cl=0.983-4.949), (p=0.002, OR= 7.540, 95% Cl=2.0337-27.914), (p=0.01, OR= 0.17, 95%=0.044-0.710), respectively. Furthermore, the majority of individuals recognised smoking as risk factors of heart attack (RFOHA), while 91.2% of them recognised at least one RFOHA and 5.6% of individuals identified all modifiable risk factors. With regards to stroke, the majority of participants (78.6%) recognised sudden numbness or weakness of the face, arm or leg as symptoms of a stroke (SOS), followed by 74.6% of them who identified sudden trouble walking dizziness, loss of balance as SOS. Only 29.8% of respondents were aware of appropriate action towards signs and symptoms of a stroke by calling an ambulance. Approximately 88.8% of individuals classified at least one SOS while 11% of them did not recognize any SOS. Moreover, 27.5% of the participants were aware of all five SOS, while 9.4% of them identified all five SOS and appropriate action. Additionally, majority of the respondents (69.2%) were aware of hypertension as stroke risk factors (SRF) and 89.2% of those identified at least one modifiable stroke risk factors (MSRF). About 9.2% of them know all MSRF. Multivariable logistic regression showed that participants aged 18-45 years were more likely to be aware of all SOS (p=0.01, OR=0.282, 95% Cl=0.083-0.963). Hypertensive participants were more likely to be aware of all SOS (p=0.01, OR=0.129, 95% Cl=0.025-0.673). The awareness and action towards HAS, SOS and its risk factors among the general public in Kuantan were poor. Participants with high education and income represented better awareness toward HAS, SOS and its risk factors than those with low level of education and income. The awareness of HAS, SOS and its risk factors is important to reduce pre-hospital delay and mortality. Educational intervention is, thus, recommended to raise the awareness of HAS and SOS as well as to reduce the mortality due to HA and stroke.

خلاصة البحث

ذكرت منظمة الصحة العالمية أن غالبية الوفيات في جميع أنحاء العالم وكذالك في ماليزيا بسبب أمراض القلب والأوعية الدموية مثل النوبة القلبية والسكتة الدماغية. الهذف من هذه الدراسة هو تقييم الوعي بالأعراض وعوامل الخطر والعمل أتجاههم بين عامة الناس في كوانتان، ماليزيا. عملت هذه الدراسة عبر استبيان ل٣٩٣ شخصًا في كوانتان تتراوح أعمارهم بين ١٨ إلي ٦٤ عامًا. أدرك غالبية المستجيبين ألم الصدر كأعراض النوبة القلبية متبوعة بضيق التنفس بنسبة ٦٨,١ ٪ ، وكانت نسبة الوعي بأستدعاء سيارة الأسعاف هي ٣٥٪ عندما يظهر شخص ما أعراض الأزمة القلبية. ٨١,٩ ٪ من االمشاركين كانوا على وعي بعرض واحد من أعراض الأزمة القلبية بينما ١٠ ٪ منهم لا يعرفون أي من الأعراض. ١١,٥ ٪ كانو واعين بجميع أعراض النوبة القلبية الخمسة ، كذالك٥,٦ ٪ من المشاركين مدركين لجميع أعراض النوبة القلبية والإجراء المناسب (استدعاء سيارة إسعاف). يظهر الانحدار اللوجستي متعدد المتغيرات العوامل التي تؤثر على الوعي بجميع أاعراض للنوبة القلبية ، كان الغير متزوجين أكثر وعيا من المتزوجين ، كذالك الملايو أكثر وعيا بالأعراض الخمسة للنوبة القلبية مقارنة بالأعراق الأخرى. الذين تلقوا معلومات حول النوبة القلبية والذين يدركون أن الأشخاص الذين لديهم نوبة قلبية يحتاجون إلى علاج سريع أظهروا أكثر وعيًا من غيرهم. كان أكبر عدد من المشاركين على وعي بالتدخين هو عوامل خطر للنوبة القلبية، بينما اعترف ٩١,٢ ٪ منهم بواحد على الأقل من عوامل اختطار النوبة القلبية القابلة للتعديل و ٥,٦ ٪ كانو على دراية بجميع عوامل الخطر القابلة للتعديل. حوالي ٥٩ ٪ منهم لديهم وعى منخفضة بعوامل الخطر النوبة القلبية، و ٤١ ٪ كان لديهم وعي كبير بعوامل الخطر للنوبة القلبية. اعترف حوالي ٧٨,٦ ٪ من خدر مفاجئ في الوجه أو الذراع أو الساق ، يلها ٧٤,٦ ٪ صعوبة في المشي وفقدان التوازن كأعراض للسكتة الدماغية. ٢٩,٨ ٪ منهم قالو أستدعاء سيارة الأسعاف عندم يشتبة بشخص يعاني من أعراض السكتة الدماغية. ٨٨,٨ ٪ عرضا واحدة من السكتة الدماغية بينما ١١ ٪ لم يعترفوا بأي أعراض. حوالي ٢٧.٥ ٪ من المشاركين لديهم وعي بجميع أعراض السكتة الدماغية الخمسة. حوالي ٦٩,٢ ٪ كانوا على دراية بارتفاع ضغط الدم كعامل خطر للسكتة الدماغية وحدد ٩٨.٢٪ منهم على الأقل عوامل خطر قابلة للتعديل للسكتة الدماغية. حوالي ٩,٢ ٪ منهم يعرفون جميع عوامل الخطر السكتة الدماغية القابلة للتعديل.

APPROVAL PAGE

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DECLARATION

I hereby declare that this thesis is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

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ACKNOWLEDGEMENTS

I thank the Almighty God for giving me the courage and determination, as well as guidance, to conduct and successfully complete this research study, despite all difficulties.

I want to take this opportunity to express my most enormous gratitude to my supervisor, Asst. Prof. Dr. Abdulkareem AL-Shami and my co-supervisor Asst. Prof. Dr. Shazia Jamshed for their generous support and guidance. I can genuinely say that I would not be an independent and successful researcher, as I am today, without his and her kind guidance.

I would like to thank my family father, mother and siblings for supporting me and giving me recommendations in continuing my master's degree.

I would like to acknowledge the ministry of higher education and scientific research in Yemen for giving me this opportunity to continue my master's degree and sponsor me during my study.

I want to take this opportunity to express my feeling to all my friends who encouraged me and pushed me before, during my journey of this master's degree.

I want to thank my best friends for supporting me in Malaysia. I shall remain eternally grateful to my brother Amran and Zuhiar as well as my sisters; I will never forget their continual support as long as I am alive.

Last, but not least, I would like to thank my lovely wife Sameeha (Samooha) for her love, patience, and support during this study period.

I also want to thank my beautiful son Amjed and my lovely daughters Sham (Shamooh), and Sudrah (Sudorah) for never complaining when I was busy with my studies; they allowed me to spend most of my time for the best convenience.

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LIST OF ABBREVIATIONS

ACS	Acute coronary syndrome
AHA	Acute heart attack
AOHARF	Awareness of heart attack risk factors
AWOHAS	Awareness of heart attack symptoms
BM	Bahasa Melayu
CVD	Cardiovascular disease
CVI	Content validity index
S-CVI/Ave	Scale level content validity index/Average
S-CVI/UA	Scale Level Content Validity Index/Universal Agreement
HA	Heart attack
HAS	Heart attack symptoms
HASC	Heart attack symptoms and call ambulance
HAR	Heart attack risk factors
IHD	Ischemic heart disease
MHARF	Modifiable heart attack risk factors
KW	Kruskal Wallis
MSRF	Modifiable stroke risk factors
RFOHA	Risk factors of heart attack
SOS	Symptoms of Stroke
SRF	Stroke risk factors
TIA	Transient ischemic attack
US	United State
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Cardiovascular diseases (CVDs) have been documented as the leading cause of mortality worldwide. The World Health Organisation (WHO) reported that about 17.9 million individuals died due to CVDs in 2016, which accounted for 31% of all deaths in the world. Out of this number, 85% (15.2 million) were attributed to heart attack and stroke (WHO, 2018). In fact, stroke is a major problem in both developing and developed countries. It is documented that the mortality rate increases with the passing of time after the first onset of stroke symptoms, making early hospitalisation a crucial factor to decrease morbidity and mortality. Additionally, better control of risk factors associated with stroke provides better management and prevention. Thus, it is imperative to improve public awareness regarding stroke and its risk factors such as hypertension, diabetes, smoking, stress and physical inactivity (Das, Mondal, Dutta, Mukherjee, & Mukherjee, 2007). On the other hand, coronary heart disease (CHD), has contributed significantly to mortality cases (Quah, Yap, Cheah, Ng, Goh, Doctor, Leong, Tiah, Chia & Ong 2014).

With respect to Malaysia, CHD was reported by WHO to account for 23.1% (29363) deaths of all mortality cases in 2014 (Abdullah, Yusoff, Basir & Yusuf, 2017). With regards to the statistics on the causes of mortality in Malaysia in 2017, ischaemic heart disease accounted for 13.9% of all deaths (Department of Statistics Malaysia, 2017). Myocardial infarction (MI) is a time-dependent illness, in which the patients' admission to the hospital at an early time yields a significant positive outcome, while pre-hospital delay affects negatively all patients with respect to their

quality of life. For instance, primary percutaneous coronary intervention relies on the time the symptoms appear and their management. Therefore, early symptoms recognition and prompt care are important (Intas, Tsolakoglou, Stergiannis, Chalari, Eleni, & Fildissis, 2015). In fact, post-MI symptoms onset, each half an hour delay in reperfusion results in an increase in mortality rate by 1.5% (McNamara, Wang, Herrin, Curtis, Bradley, Magid, Peterson, Blaney, Frederick, Krumholz, & Krumholz, 2006). In contrast, the mortality rate has been shown to improve by 23% when reperfusion occurs within three hours and by 50% within one hour, following MI symptoms onset (Simoons, Serruys, Van den Brand, Res, Verheugt, Krauss, Remme, Bär, de Zwaan, van der Laarse, & Van der Laarse, 1986). Moreover, there are several modifiable risk factors that lead to CHD, such as unhealthy foods/drinks (e.g., fast foods, trans fats, fizzy drinks), obesity, lack of physical activity, smoking, alcohol consumption, hypertension, diabetes, and high cholesterol. On the other hand, awareness towards CVDs, i.e., heart attack and stroke, and its modifiable risk factors is imperative, as it might lead to improvement in individual's lifestyle and motivation to seek medical assistance at emergency department, which if done at early stage can lead to remarkable reduction of morbidity and mortality (Awad & Al-Nafisi, 2014).

This highlights the importance of exploring individuals' knowledge regarding CVDs. However, only a few studies have assessed CVDs risk factors knowledge among the lay public (Amin, Hamza, & Azmi, 2014; Ibrahim, Rahman, Rahman, & Haque, 2016; Muhamad, Yahya, & Yusoff, 2012). Furthermore, and focusing in Malaysia, there is a paucity of research which focuses to explore the awareness towards symptoms and risk factors of heart attack and stroke among the lay public of Malaysia.

1.2 HEART ATTACK

A heart attack is also known as myocardial infarction and it occurs when there is inadequate blood flow to a part of the heart causing damage to the heart muscle (Center for disease control and prevention, 2017).

1.2.1 Common Signs and Symptoms of Heart Attack

According to the American Heart Association (American Heart Association, 2018), the major five symptoms of heart attack are:

1- Chest pain or discomfort

2- Pain or discomfort in the jaw, neck, or back

3- Shortness of breath

4- Light-headedness, nausea, or losing consciousness

5- Pain in arm or shoulder

1.2.2 Risk Factors Associated with Heart Attack

The most common risk factors which lead to myocardial infarction include smoking, hyperlipidaemia, hypertension, diabetes, obesity, unhealthy diet, physical inactivity, alcohol consumption, and psychosocial factors. They account for more than 90% of the risk factors of acute heart attack (AHT) (Yusuf, Hawken, Ôunpuu, Dans, Avezum, Lanas, & Varigos, 2004). The same research also found that the risk factors were the same in every socio-demographic (including male and female) and also the same for every race in the world (Yusuf et al., 2004). Many health problems such as lifestyle, age, and family history lead to raising heart disease risk factors. The awareness of risk factors for heart attack and stroke is crucial to reducing the mortality rate. Among the risk factors, the three most common which are hypertension, hypercholesterolemia,

and smoking can be managed by medicine. However, several other risk factors of heart disease cannot be prevented such as age or family history. However, the public can take precautions to decrease risk by controlling variable factors such as smoking, hypertension, obesity, diabetes and hypercholesterolemia (Center for disease control and prevention, 2017).

1.3 STROKE

Stroke or transient ischemic attack (TIA) occurs when a clot blocks the blood supply to part of the brain or when a blood vessel in the brain bursts. In either case, parts of the brain become damaged or die. A stroke can cause long-lasting brain damage and long-term disability, or even death (Center for disease control and prevention, 2017).

1.3.1 Common Signs and Symptoms of Stroke

Awareness about cardiovascular diseases such as heart attack and stroke and their modifiable risk factors is important to improve patient's lifestyle practice and presentation to the emergency department at an early stage, and also to reduce morbidity and mortality (Awad & Al-Nafisi, 2014). According to the American Stroke Association in 2018, there are five symptoms of stroke which are:

1. Sudden numbness or weakness in the face, arm, or leg, especially on one side of the body.
2. Sudden confusion, trouble speaking, or difficulty understanding speech.
3. Sudden trouble seeing in one or both eyes.
4. Sudden trouble walking, dizziness, loss of balance, or lack of coordination.
5. Sudden severe headache with no known cause.

1.3.2 Risk Factors Associated with Stroke

Epidemiological studies have reported that stroke and heart attacks do not happen without reasons. There are some risk factors that can be modified such as smoking, hypertension, obesity, hypercholesterolemia, diabetes and others which cannot be modified through medical care or changes in lifestyle such as age (Boehme, Esenwa, & Elkind, 2017; Deoke, Deoke, Saoji, & Hajare, 2012). The most common non-modifiable risk factors associated with stroke are age, family history, gender, and ethnicity. Though stroke can take place at any age even in childhood or youth, it is more likely to happen at the age of 55 to 85 (NINDS, 2019). Furthermore, males have a high-risk factor for stroke as compared to females (NINDS, 2019). Another risk factor is ethnicity. For example; African Americans and Hispanic Americans (Caucasians) are more at risk and thus reported a higher number of deaths from stroke as compared to whites' people (National Institute for Clinical Excellence, 2002).

1.4 PROBLEM STATEMENT

Coronary heart disease and stroke have been designated as the leading major causes of mortality in Malaysia (Abdullah et al., 2017). According to the World Health Organisation, the mortality rate of coronary heart disease within Malaysia is actually increasing and was responsible for 23.10% of the total deaths in 2014 (Abdullah et al., 2017). The leading cause of the high rate of mortality due to heart attack and stroke is a lack of awareness towards signs and symptoms of heart attack and stroke (Patel, Fang, Gillespie, Odom, Luncheon, & Ayala, 2018). The other significant cause is a late presentation to the hospital after getting the signs and symptoms of heart attack and stroke (Chai, Putit, & Siop, 2016). Pre-hospital delay after the initiation of symptoms could have bad consequences on the prognosis and treatment of heart

attack. Thus, an early presentation to the hospital for those who suffer from heart attack symptoms is critical. Furthermore, quick reperfusion by using thrombolytic treatment has been shown to significantly reduce the death by 50% if it is carried out during two hours from the occurrence of the symptoms (Boersma, Maas, Deckers, & Simoons, 1996 et al; Bonnefoy, Steg, Boutitie, Dubien, Lapostolle, Roncalli, Dissait, Vanzetto, Leizorowicz, Kirkorian, & Kirkorian, 2009; Taher, Fu, Wagner, Goodman, Fresco, Granger, Wallentin, Van de Werf, Verheugt, & Armstrong 2004; Trialists, 1994). It is evident from the previous researches (Smith, Doliszny, Shahar, McGovern, Arnett, & Luepker 1998; Chai, et al 2016; Foo, Reidpath, & Chaiyakunapruk, 2016; Lim, Rahman, & Yaacob, 2019) that a significant number of patients are generally admitted to the hospital several hours after the onset of the signs and symptoms. This can be fairly related to poor recognition of symptoms and risk factors of a heart attack and stroke. The awareness and knowledge of the signs and symptoms of heart attack and stroke are important in reducing mortality. Good strategies to increase the awareness of the signs and symptoms of heart attack and stroke include education in schools and universities as well as through simulation and demonstration on the television (TV) and social media such as facebook, youtube, WhatsApp and Twitter (Saberi, Adib-Hajbaghery, & Zohrehie, 2017). Furthermore, heart attack and stroke possess similar lifestyle risk factors and the lay public must be aware of these risk factors. However, studies about the knowledge and awareness of signs and symptoms of heart attack and stroke in Malaysian lay public are limited. Issues related to awareness and knowledge are also unclear. Consequently, well-designed studies are needed to address these issues. Therefore, this study was designed to assess the awareness and action towards the signs and symptoms of heart attack and stroke among the lay public in Kuantan Pahang, Malaysia.

1.5 SIGNIFICANCE OF THE STUDY

Most of the declines in coronary heart disease mortality in recent years have been owing to early reperfusion utilizing thrombolytic therapy. It is well known that when reperfusion occurs in the first hour, the mortality rate declined by 50%, unlike the first three hours when reperfusion might happen the mortality possibly may decrease by 23% (Kim, Lee, Kim, Park, Park, Kang, & Seo, 2016). However, delay in seeking medical care can be caused by a lack of awareness of the signs and symptoms of heart attack and stroke. Furthermore, the current research attempts to explore the reasons behind late presentation to the hospital and assess the awareness and action towards signs and symptoms of heart attack and stroke among the lay public in Kuantan. The current research is expected to contribute towards assisting health care educators in developing programs, interventions, and strategies to address the problems associated with a lack of awareness and action towards signs and symptoms of heart attack and stroke. It will also help in managing the complications of a heart attack or stroke on the basis of early detection and thereby reducing the death rate. Additionally, this study is expected to establish a platform for further research in assessing awareness and action towards stroke and heart attack among the Malaysian population.

1.6 RESEARCH QUESTIONS

1- What are the awareness and action towards signs and symptoms of heart attack and stroke among the lay public?
2- What is the awareness of risk factors of heart attack and stroke among the lay public?

3- Is there any association between socio-demographic characteristics and awareness of all the five signs and symptoms of heart attack and stroke?

1.7 RESEARCH HYPOTHESIS

1- The awareness and action towards signs and symptoms of heart attack and stroke among the lay public are low.
2- The awareness about risk factors of heart attack and stroke among the lay public are poor.
3- There is an association between the socio-demographic variables and awareness of all five signs and symptoms of heart attack and stroke.

1.8 AIMS AND OBJECTIVES

1.8.1 General Aim

To assess the level of awareness and action towards signs and symptoms of heart attack and stroke and its risk factors among the lay public in Kuantan, Malaysia.

Specific Objectives

1- To assess the awareness and action towards signs and symptoms of heart attack and stroke among the lay public.
2- To examine the awareness of risk factors of heart attack and stroke among the lay public.
3- To determine the association between the socio-demographic characteristics and their relationship with the awareness of all the five signs and symptoms of heart attack and stroke.

CHAPTER TWO

LITERATURE REVIEW

2.1 THE SIGNS AND SYMPTOMS OF HEART ATTACK AMONG LAY PUBLIC

Awareness towards signs and symptoms of heart attack is essential for taking appropriate action and immediate treatment when the heart attack occurs. The five major signs and symptoms of heart attack are (i) Chest pain or discomfort: this is the most common symptom of a heart attack. It comes with pain or discomfort in the center of the chest and lasts more than a few minutes, or it may go away and then return. The victim feels uncomfortable pressure, squeezing, fullness or pain. Several studies reported that chest pain is the first symptom of heart attack (Fang, Gillespie, Keenan, & Greenlund, 2011; Greenlund, Keenan, Giles, Zheng, Neff, Croft, & Mensah, 2004; Kim et al., 2016). (ii) Pain or discomfort in the jaw, neck, or back (Greenlund et al., 2004). (iii) Shortness of breath is the third symptom of a heart attack. It was also reported in a study performed among the Greeks that 34.5% of individuals experienced shortness of breath as a heart attack symptoms (Intas et al., 2015). (iv) Light-headedness, nausea, or faint and (v) Pain in the arm or shoulder. A study from South Korea reported that 32.9% of the participants were aware of early symptoms of the shoulder or arm pain and 79.1% of them were aware of pain or discomfort in the chest (Kim et al., 2016). According to another study, chest pain was recognised by around 80% of the population, while a pain in the left shoulder was acknowledged by 61% (Khan, Shehnaz, Guruswami, Ibrahim & Mustafa, 2017). Another study was conducted in Poland to assess the knowledge of acute myocardial infarction symptoms by using the Behavioral Risk Factor Surveillance System. The

findings of this study indicated that 5.4% of participants were aware of all known symptoms of heart attack and only 68% of respondents knew the emergency phone number. The lay public showed more awareness about chest pain as a symptom of heart attack than other symptoms of acute myocardial infarction (Kopec, Sobien, Podolec, Dziedzic, Zarzecka, Loster, Pajak, & Podolec, 2010).

Furthermore, a study performed in Nepal reported that 60.4% of all participants showed significant knowledge about signs and symptoms of heart attack and 39.6% of them demonstrated poor knowledge about the signs and symptoms (Adhikari & Bhandari, 2017). A study in Rhode Island reported that 96.4% recognised the chest pain or discomfort as heart attack warning sign while 38.6% of all participants knew all the five warning signs and symptoms of heart attack (Pearlman Deborah, Affleck Patricia & Goldman Dona, 2011).

Likewise, a study done in nine European countries showed that more than 50% of the respondents identified chest pain as a symptom of heart attack and 8% of them did not know any symptoms of heart attack (Mata, Frank, & Gigerenzer, 2014).

A recent study that was carried out in 2018 among lay people in the Midwestern United States demonstrated higher knowledge of myocardial infarction typical symptoms than atypical symptoms. People with high education, high monthly income, and medical insurance also had a more excellent knowledge of myocardial infarction than those who do not have the privileges (Banharak, Zahrli, & Matsuo, 2018). However, a study conducted on the North East coast (Kelantan) Malaysia reported that 86.6% of women were aware of the shortness of breath while 85.9% were aware of chest pain, and pain in the jaw as heart attack symptoms. The awareness about the left shoulder and neck pain, however, was the lowest (Muhamad et al., 2012). Another study conducted in Singapore in 2014 demonstrated that 85.1%