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REVIEW ARTICLE

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PAIN INTENSITY AND PAIN INTERFERENCE AMONG TRAUMA PATIENTS: A LITERATURE REVIEW

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ABSTRACT

Background: The incidence of trauma has been high and has gained attention worldwide. The energy involved in trauma results in specific tissue damage. Such tissue damage generally leads to pain. The high pain intensity possibly is consequence of trauma due to transfer energy to the body from external force and absorbed in wide area. This pain affected patients' physical and psychological function, in which well known as pain interference.

Objective: The aim of this review is to describe the pain intensity and pain interference among trauma patients.

Method: A systematic search of electronic databases (CINAHL, ProQuest, Science Direct, and Google scholar) was conducted for quantitative and qualitative studies measuring pain intensity and pain interference. The search limited to hospitalized trauma patients in adult age.

Results: The search revealed 678 studies. A total of 10 descriptive studies examined pain intensity and pain interference and met inclusion criteria. The pain intensity and pain interference were assessed using Brief Pain Inventory (BPI). Pain intensity of hospitalized trauma patients were moderate to severe. These including 6 studies in orthopedic trauma, one study in musculoskeletal, two in studies in combinational between orthopedic and musculoskeletal, and two studies in burn injury. Moreover, the patients also reported pain was relentless & unbearable. In accordance, data showed that pain interference was moderate to severe from six studies. These studies result in vary of functional interference. However, those studies examined pain interference on sleep, enjoyment of life, mood, relationship with other, walking, general activity, and walking.

Conclusion: The evidence from 10 studies included in this review indicates that hospitalized trauma patients perceived moderate to severe pain intensity and pain interference. Further research is needed to better evaluate the pain of hospitalized trauma patients.

Keywords: pain, traumatic pain, acute pain, pain interference

INTRODUCTION

Trauma is the leading cause of death throughout the world.¹ It also recognized that fall and traffic accident are the main causes.¹ United States and European countries noted that the incident of trauma remain high in each year, 2.3 and 5.7 million, respectively.² Developing countries have mortality rates that are higher than developed countries.³ According to this OECD, average injury mortality was estimated to be 88 deaths per 100.000 population in 2008 in Asian countries.

Trauma incident results in pain that closely related to acute pain, which typically self-limited and resolves over days to weeks, or even persist for three months.⁴ Pain in trauma is occurred due to tissue damage and leads to direct stimulation to nociceptor and neuropathic.⁵ Nociceptive pain results from activation of primary afferent nociceptors (A-delta and C-fibers), while neuropathic results from aberrant signal processing in the peripheral or central nervous system. Moreover, pain in trauma consider have differed from other pain because it varies of mechanism involve including blunt, penetrating, blast, thermal, and chemical.⁶ Also, the transfer energy to the body from external force and absorbed in wide area.⁵

A symptom management model provides explanation about symptom.⁷ There are three main components in this model, symptom experience, management strategies, and outcome. In this model, the symptom defined as the subjective experience represents the dynamic of the bio-psychosocial functioning, sensation, or cognition of the person.⁷ One of the

symptoms mentioned in this model is pain. As a symptom pain is an indicator of change in the body that is recognized by oneself or another. Recognition of pain leads to strategies in order to relief and prevent adverse effect. Thus, the outcomes are related to pain and its management. For example, traumatic pain affects the patients' physical (e.g. muscle tension or atrophy and immobility) and psychological distress, such as anxiety.^{8,9} However, this study will focus on the pain intensity and pain interference. Meanwhile, pain management strategies are discussed in other series of this study.

Pain intensity is defined as a highly personal experience that can only be accurately described by the person who has pain. Accordingly, pain interference patient perception of the particular interference caused by pain with physical and psychological function.^{10,11} This implied that both of pain intensity and pain interference are subjective that requires patients rating. However, published research have mostly assessed acute pain of postoperative patients as well as pain interference.¹²⁻¹⁴ For instance, a study of Suza¹³ describe the acute pain of 120 patients after abdominal and orthopedic surgery. This study found reported that patients perceived pain at its worst at severe level, on average and right now as moderate level. Also, patients rated moderate to severe level of pain interference in physical and psychological functional.

Moreover, the subjective experience of symptom and outcome are influenced by many factors, such as health and illness factors.⁷ At this point, the

mechanism after trauma may make patients identify pain more complicatedly than patients after elective surgical pain.⁶ Clinicians and researcher can benefit from more detail of pain intensity and pain interference among trauma patients. Also, the necessary knowledge regarding both of variables will be useful for improvement the quality of care. Thus, the aim of this present literature review is to determine pain intensity and pain interference among trauma patients.

METHODS

Electronic searches were conducted to identify English journal published 2006 to 2015 in the CINAHL, ProQuest, Science Direct, and Google scholar. The search terms were 'trauma', 'injury', 'accident', 'pain', 'pain interference, and 'functional'. Descriptive studies with adult, hospitalized, and trauma population were eligible for inclusion criteria. Furthermore, the researcher has reviewing article titles and abstracts from the publications retrieved.

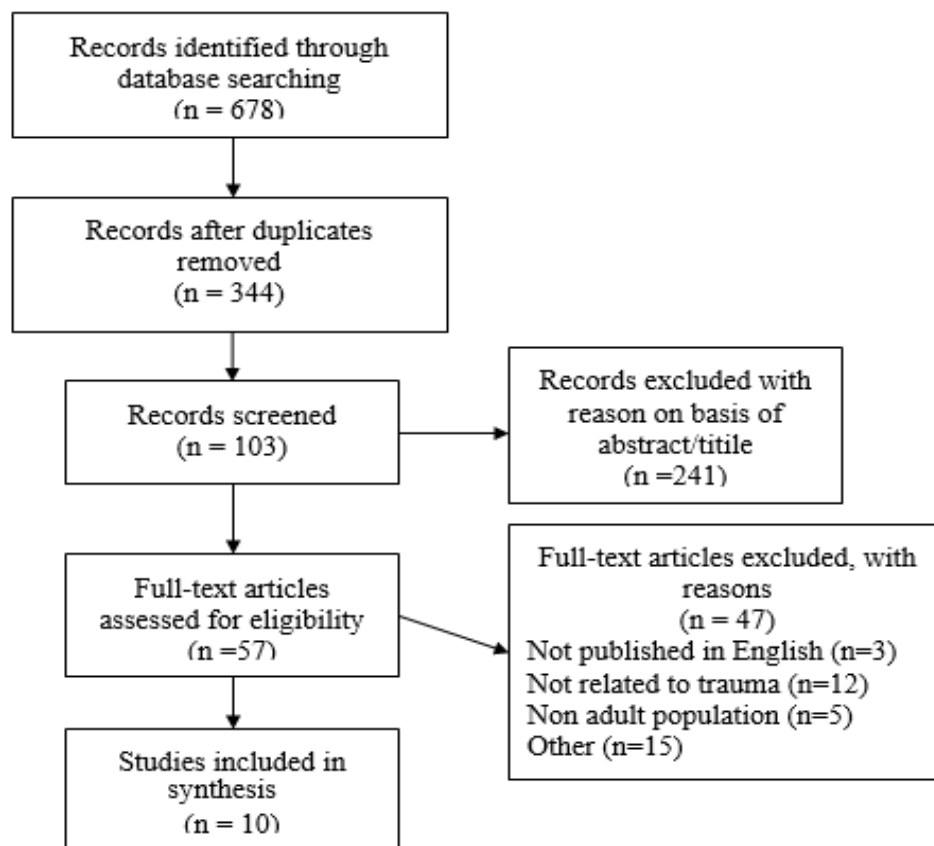


Figure 1 Flow diagram depicting the systematic review process

Figure 1 depicts the process used to identify and select relevant journal articles. The articles that are relevant were read and analyzed carefully to synthesize the

methodology and findings. From the overall 57 relevant articles, 10 articles were selected through analysis for this

study while other studies used to describe the other components in this study.

The review included 3196 trauma patients from 10 studies. Sample sizes for each study range from 60 to 1290 participants with ages of participants above 16 years old. Assessment was conducted during hospitalization, two studies at emergency department,^{4,15} one study at hospital discharge,¹⁶ two studies after patients had surgery.¹⁷⁻²¹ The majority of participants were admitted due to MVC and fall with the length of hospital stay ranging from 1 to 14 days in hospital.

RESULTS

Pain Intensity and Pain Interference of Trauma Patients

According to the International Association for the Study of Pain (IASP),²² pain is unpleasant experience involving sensory and emotional that related to potential tissue damage. Not surprise if trauma patients have experience pain initiated right after injury.²³ Traumatic pain is acute and primarily nociceptive and not neuropathic in nature.⁴ Also, it is believed to unlike with other pain due to uncontrolled destructive force.⁵ The transfer of energy that absorbed by wider and deeper are result in greater pain intensity. Thus, most of trauma patients reported high level of pain intensity.

Indeed, traumatic pain affected to individuals' function (physical and psychological). Traumatic pain activated response on all body systems.⁶ The physical and psychological disturbance resulted by pain is pain interference.¹¹ The physical functioning included the interference of general activity, movement,

sleep, and relationship with others, whereas the psychological and social functioning included determining how pain interfered with mood and enjoyment of life.

Studies have been conducted in describing pain intensity and pain interference. Most of studies reported numeric rating scale (NRS) as tool to measure pain (see Table1). Five of studies in this review used NRS of brief pain inventory (BPI) to asses both of pain intensity and pain interference. One study used visual analogue scale (VAS) in McGill Pain Questionnaire.

A total of 10 western studies described pain intensity of trauma patients as moderate to severe, while only three studies assessed pain interference. Those who studied pain interference found that patients rated moderate to severe of pain interference. Detail of the studies is presented as follows:

Archer, Castillo, Wegener, Abraham, Obremskey¹⁶ assessed pain intensity and pain interference with brief pain inventory (BPI) of 233 orthopedic trauma patients, 97% of patients reported having pain at hospital discharge, with 38% reporting mild pain, 35% moderate pain, and 24% severe pain. Also, 73% of patients who reported pain also rated moderate to severe pain interference. It also found that the walking ability and the general activity were rated highly frequent interference followed by sleep, enjoyment of life, mood, and relationship with others.¹⁶ Similarly, Platts-Mills, Burke, Lee, Swor, Zaleski, Clauw, McLean¹⁵ studies in 156 of orthopedic and musculoskeletal trauma patients. This

study found that patients reported moderate to severe of pain intensity and pain interference as measured by BPI. The pain interference mostly affected to walking (M=5.1/10) and general activity (M=4/10).¹⁵ Likewise, although did not study in pain interference, however, Berben et al found that majority of 480 orthopedic and musculoskeletal trauma patients perceived moderate to severe pain intensity. More musculoskeletal patients,

study in metropolitan hospital conducted by Rosenbloom²⁰ found that 80% of 205 Canadian patients with musculoskeletal injury perceived moderate to severe level of pain intensity and pain interference during their 14 days of hospitalization. However, no further detail regarding functional impacted.

Table 1 Pain intensity and pain interference at studies reviewed

Study	Sample	Pain measure	Pain Intensity	Pain Interference
Berben et al. (2008)	N= 450 Orthopedic & musculoskeletal	NRS	Moderate or severe	-
Williamson et al. (2009)	N=1290 Orthopedic	NRS	Moderate to severe	-
Clay et al. (2010)	N= 108 Orthopedic		High	-
Browne et al. (2011)	N=492 Burn Injury	BPI	During resting M=6.05 (SD=2.51); Dressing change M=7.40 (SD=2.48); Physical activity M=6.65 (SD=2.68)	-
Wylde et al. (2011)	N= 105 Orthopedic	VAS	Moderate or severe (mostly feel lower in night)	-
Helmerhorst et al. (2012)	= 60 Orthopedic	NRS	Moderate to severe	-
Andrews et al. 2012	N= 97 Burn Injury	BPI	M=3.29 (SD=1.97)	-
Archer et al. (2012)	N= 233 Orthopedic	BPI	38% mild; 35% moderate; 24% severe pain	Moderate to severe
Platts et al. (2012)	N= 156 Orthopedic & musculoskeletal	BPI	Moderate or severe	Moderate or severe
Rosenbloom (2014)	N= 205 Musculoskeletal	BPI	M=5.4(SD=1.86)	M=7.07(SD=2.33)

Burn injury patients also reported moderate to severe pain intensity.^{18,24}. Both of studies noted that patients perceived more pain during dressing changes. Because of this procedure is manipulating the existing inflamed tissue, thus contribute to rising of pain intensity.

Andrews, Browne, Wood, Schug²⁴ noted that the patients burden of dressing changing leads to psychological disturbance such as depression.

Some patients may perceive major trauma and procedure such as surgery is necessary. In postoperative studies, the

patients' perception of pain intensity is moderate to severe.^{17,25} Almost all of 105 patients with postoperative due to orthopedic trauma demonstrated moderate to severe as measured by Visual Analogue scale (VAS).²⁵ In this study, the pain intensity measure as much as five times per day within three days post-operative. The time frequency included morning, midday, afternoon, evening, and night. Mostly, the patients reported pain at day one is a peak of intensity then decrease following day. Also, night time is the lower of pain perceived compare to other times.²⁵ In correspondence, the study of Helmerhorst, Lindenhovius, Vrahas, Ring, Kloen¹⁷ showed that sixty American patients after surgery due to ankle fracture are reported severe pain. The patients are evaluated their pain intensity after surgery and when suture removal (i.e. five days) and decreased over time.

DISCUSSION

The aim of this review was to described pain intensity and pain interference that reported by trauma patients. Most of studies have asked patients to rate NRS. The finding demonstrate that trauma patients perceived moderate to severe pain intensity during one to 14 days of their hospitalization. As well as pain interference reported by three studies. In addition, there is evidence that pain was decreased over time.

Nine studies used NRS and one study used VAS. These scales different in term of the way patients give rating. NRS is more practical than a VAS, easier to understand for most people, and does not need a clear vision, dexterity, paper, and pen.²⁶ However, Both the VAS and NRS

agree well and are equally sensitive in assessing acute pain.^{26,27} Moreover, in the nine studies that used NRS, five were used pain intensity scale of BPI. The BPI assesses the pain severity and the degree of interference with function. The patient rates their present pain intensity, 'pain now', and pain 'at its worst', 'least', and 'average' over the last 24 hours. Also, they are asked to rate how much pain interferes with seven aspects of life (general activity, walking, normal work, relations with other people, mood, sleep, and enjoyment of life).²⁸ It has proven reliable (Cronbach's alpha > .80) and valid (highly correlated with the short form-36 brief pain scale, the Roland Disability Questionnaire, the McGill Pain Questionnaire, and the Visual Analog for pain) in surgical patients.²⁹

Orthopedics injuries are the most prevalent type of injury; also, MVC and fall are the main causes of hospital admission. Patients with orthopedics tent to rated moderate to severe pain intensity, thus results in same level of pain interference. The several of body region involvement in orthopedic injury results in high pain intensity.^{6,20} Likewise, burn injury patients also perceived moderate to severe level of pain intensity, in more particularly during the dressing change. The existing tissue damage areas are inducing pain sensation.

The most frequent pain interference from three studies was walking ability and general activity. With regards that participants from these studies were orthopedics and musculoskeletal injury. Not surprise if the pain interference to most of physical functional related to extremities. Moreover, Archer, Castillo,

Wegener, Abraham, Obremsky¹⁶ also found that enjoyment of life and mood were disturbed. High pain intensity affected patient psychological function.⁶

CONCLUSION

The evidence from 10 studies indicates that trauma patients perceived moderate to severe pain, in particular during hospital stay. The NRS of BPI were most frequent tool used to assess pain of trauma patients. This includes pain¹³⁶ interference. The available evidence seems to suggest that trauma patients perceived moderate to severe level of pain interference during hospitalization. In addition, current literatures on these variable abounds with examples of western studies in trauma patients due to MCV, fall, and burn injury.

The limitation of this study include small sample size and did not analyse the factors. Many of studies did not reported pain interference, while only limited to three studies.

Overall, the results from this review indicate the recommendation to future research in traumatic pain. This can be conduct in hospital setting within one to 14 days of admission. This knowledge leads to awareness of healthcare provider to provide good pain management for trauma patients. To emphasis the knowledge, understanding this phenomenon in Eastern country and developing country is necessary.

Declaration of Conflicting Interest

There is no conflict of interest to be declared.

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Authorship Contribution

Deya Prastika reviewed the articles, contributed with the design and analysis, and drafted the manuscript. Luppana Kitrunrote, Jintana Damkliang were the study advisors of Deya Prastika. All authors agreed with the final approval of the study.

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