UNIVERSITI PUTRA MALAYSIA

CLINICAL HYPNOSIS TO REDUCE CLINICAL AND PSYCHOLOGICAL RISK FACTOR OF POST-SURGICAL PAIN IN PATIENTS UNDERGOING TOTAL KNEE REPLACEMENT

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By

LEE JI KWAN

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Doctor of Philosophy

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in fulfilment of the requirement for the degree of Doctor of Philosophy

CLINICAL HYPNOSIS TO REDUCE CLINICAL AND PSYCHOLOGICAL RISK FACTOR OF POST-SURGICAL PAIN IN PATIENTS UNDERGOING TOTAL KNEE REPLACEMENT

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January 2018

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Faculty: Medicine and Health Sciences

Purpose

There has been an increasing interest among clinicians and researchers to develop surgical care strategies to prevent chronic post-surgical pain (CPSP). The objective of this study was to examine the efficacy of clinical hypnosis to alleviate risk factors associated with CPSP in patients undergoing total knee replacement (TKR) surgery. The study hypothesized that participants randomly assigned to clinical hypnosis (HYP condition) would report significantly greater reductions in acute post-surgical pain (APSP) intensity, anxiety, depression, and pain catastrophizing than participants randomly assigned to the minimal-effect treatment (MET) or treatment as usual (TAU) control conditions.

Methodology

This was a single-blinded, open-label, three-arm, randomized, parallel-group controlled study. The study population included adult patients with knee injury that required TKR intervention. Individuals awaiting TKR in Hospital Kuala Lumpur (1) aged 18 and above, (2) able to converse in Malay, English, or Mandarin, and (3) able to provide informed consent were screened for eligibility to participate in the randomized-controlled trial (RCT) using the Depression Anxiety Stress Scale (DASS) and the Pain-Related Self-Statement (PRSS). Those diagnosed with (1) any psychiatric disorders, (2) terminal illnesses, and/ or (3) chronic pain conditions other than the reason for surgery were excluded. Upon screening, individuals with (1) an average pain score of $\geq 4/10$ in the past week and (2) reported moderate levels of anxiety, depression, and/or catastrophizing were enrolled into the RCT.

Randomization was done with replacement by matching randomly generated numbers with a pre-generated list.

Twenty-four (N = 24) pariticipants were randomly assigned to receive (1) a pre-recorded hypnotic intervention with music (HYP; n = 8), (2) breathing relaxation training intervention with music (MET; n = 8), or (3) treatment as usual (TAU; n = 8). Immediate pain relief, 72-hour APSP intensity, and pain intensity at 1-, 3-, and 6-months were measured using a 0 - 10 Numerical Rating Scale (NRS). Psychological outcome variables were measured on discharge using the Hospital Anxiety Depression Scale (HADS) and Pain Catastrophizing Scale (PCS). The treatment effects were analyzed using Analysis of Variance (ANOVA) and Fisher's exact test performed with SPSS 21.

Results

For immediate pain relief effects of HYP, mixed ANOVA revealed that the Time (before, after) X Treatment (HYP, MET, TAU) interaction effect was medium but not statistically significant (p = .418, η_p^2 = .08). In addition, ANOVA showed that the treatment main effect on overall APSP intensity in the first 72 hours was medium but not statistically significant (p = .316, η_p^2 = .10). Similarly, the Time (1-, 3-, 6-months) X Treatment (HYP, MET, TAU) interaction effect on pain over the six months follow-up period resulted in a medium but not statistically significant effect (p = .461, η_p^2 = .08). ANOVA revealed large and statistically significant treatment main effects for anxiety (p = .025, η_p^2 = .30) and pain catastrophizing (p = .043, η_p^2 = .26). Post hoc analyses indicated that the HYP group (anxiety: M = 3.13, SD = 3.40; pain catastrophizing: M = 5.00, SD = 4.84) reported large and statistically significant decreases in anxiety (p = .014, η_p^2 = .36) and pain catastrophizing (p = .013, η_p^2 = .36) relative to TAU (anxiety: M = 7.00, SD = 1.93; pain catastrophizing: M = 18.75, SD = 12.78), while no statistically significant effect was found in the MET group (anxiety: M = 7.88, SD = 4.42; pain catastrophizing: M = 16.75, SD = 13.24), relative to TAU (anxiety: p = .616, η_p^2 = .02; pain catastrophizing: p = .763, η_p^2 = .01). The observed treatment main effect on depression was very weak (p = .939, η_p^2 = .01).

Conclusion

The current study shows that pre-recorded hypnosis is largely effective in reducing peri-surgical anxiety and pain catastrophizing. However, the alleviation of anxiety and pain catastrophizing did not result in statistically significantly better pain outcomes in the current sample, relative to treatment as usual. Further research is needed to clarify the mechanisms of risk factors in contributing to the development of CPSP, and identify more effective strategies for the prevention of CPSP.

Keywords: Clinical hypnosis, chronic post-surgical pain, peri-surgical care, randomized controlled trial, total knee replacement

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

HIPNOSIS KLINIKAL UNTUK MENGURANGKAN FAKTOR RISIKO KLINIKAL AND PSIKOLOGIKAL YANG MENINGKATKAN SAKIT SELEPAS PEMBEDAHAN DALAM PESAKIT YANG RAWATAN MENERIMA PENGGANTIAN LUTUT TOTAL

Oleh

LEE JI KWAN

Januari 2018

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Fakulti: Perubatan dan Sains Kesihatan

Tujuan

Terdapat minat yang semakin meningkat dalam kalangan doktor dan ahli penyelidik untuk membangunkan strategi penjagaan pembedahan untuk mencegahan kesakitan kronik selepas pembedahan (CPSP). Objektif kajian ini adalah untuk menilai keberkesanan hipnosis klinikal bagi mengurangkan faktor risiko yang berkaitan dengan CPSP dalam kalangan pesakit yang menjalani pembedahan penggantian lutut keseluruhan (TKR). Kajian ini mengandaikan bahawa peserta yang dibahagikan secara rawak kepada kumpulan hipnosis klinikal (HYP) akan melaporkan pengurangan dalam tahap kesakitan akut selepas pembedahan (APSP), tahap kecelaruan, kemurungan, dan *pain catastrophizing* yang lebih signifikan berbanding dengan peserta yang dibahagikan secara rawak kepada kumpulan rawatan kesan minimum (MET) ataupun rawatan seperti biasa (TAU).

Metodologi

Kajian ini merupakan sebuah kajian "*single blinded*", berlabel terbuka dan merangkumi tiga kumpulan selari terkawal yang dibahagikan secara rawak. Populasi kajian ini melibatkan orang dewasa yang mengalami kecederaan lutut yang memerlukan TKR. Individu-individu yang sedang menunggu rawatan TKR di Hospital Kuala Lumpur yang (1) berumur 18 dan keatas, (2) boleh berbicara dalam Bahasa Melayu, Inggeris, atau Cina, dan (3) dapat memberi keizinan untuk menyertai kajian ini telah disaring untuk kelayakan bagi mengambil bahagian dalam Kajian Terkawal Rawak (RCT) dengan menggunakan *Depression Anxiety Stress Scale* (DASS) dan *Pain-Related Self-Statement* (PRSS). Individu yang telah diberi

diagnosis dengan (1) penyakit psikiatri, (2) penyakit terminal, dan/ atau (3) kesakitan kronik selain daripada tujuan pembedahan telah dikecualikan. Selepas penyelesaian saringan, individu yang (1) mengalami skor purata kesakitan ≥ 4/10 pada minggu sebelumnya dan (2) melaporkan tahap kecelaruan, kemurungan, dan/ atau *pain catastrophizing* yang sederhana telah mengambil bahagian dalam RCT. Proses pembahagian secara rawak dijalankan dengan memadankan nombor yang diperoleh secara rawak dengan senarai nombor yang telah dijana secara rawak sebelum ini.

Dua-puluh empat peserta (N = 24) dibahagikan secara rawak untuk menerima (1) rakaman hipnosis dengan muzik (HYP; n = 8), (2) relaksasi dengan muzik (MET; n = 8), atau (3) rawatan seperti biasa (TAU; n = 8). Kesan dari segi kelegaan kesakitan segera, intensiti APSP dalam jangka masa 72-jam, dan intensiti kesakitan pada jangka masa 1-, 3-, 6-bulan selepas pembedahan diukur dengan skala 0 - 10 *Numerical Rating Scale* (NRS). Pembolehubah psikologi diukur dari masa discaj dengan menggunakan *Hospital Anxiety Depression Scale* (HADS) dan *Pain Catastrophizing Scale* (PCS). Efek rawatan dianalisa dengan menggunakan Analysis *of Variance* (ANOVA) dan *Fisher's exact test* dengan menggunakan SPSS 21.

Keputusan

Bagi kesan kelegaan kesakitan segera dari HYP, mixed ANOVA menunjukkan bahawa kesan interaksi Masa (sebelum, selepas) X Rawatan (HYP, MET, TAU) adalah sederhana, namun ia tidak mempunyai kesan yang signifikan (p = .418, η_p^2 = .08). Di samping itu, keputusan ANOVA menunjukkan bahawa kesan rawatan utama ke atas intensity APSP dalam jangka masa 72 jam pertama adalah sederhana, namun tidak mempunyai efek signifikan (p = .316, η_p^2 = .10). Begitu juga dengan kesan interaksi Masa (1-, 3-, 6-bulan) X Rawatan (HYP, MET, TAU) terhadap kesakitan yang dilaporkan pada tempoh susulan 6 bulan di mana kesan adalah sederhana, namun tidak mempunyai efek signifikan (p = .461, η_p^2 = .08). ANOVA menunjukkan saiz efek utama rawatan yang besar dan signifikan ke atas kecelaruan (p = .025, η_p^2 = .30) and *pain catastrophizing* (p = .043, η_p^2 = .26). Analisa post hoc pula menunjukkan bahawa kumpulan HYP (kecelaruan: M = 3.13, SD = 3.40; *pain catastrophizing*: M =5.00, SD =4.84) melaporkan pengurangan saiz efek yang besar dan signifikan dari segi kecelaruan (p = .014, η_p^2 = .36) dan *pain catastrophizing* (p = .013, η_p^2 = .36) berbanding dengan TAU (kecelaruan: M = 7.00, SD = 1.93; *pain catastrophizing*: M = 18.75, SD = 12.78), manakala tiada kesan yang signifikan ditemui dalam kumpulan MET (kecelaruan: M = 7.88, SD = 4.42; *pain catastrophizing*: M = 16.75, SD = 13.24), berbanding dengan TAU (kecelaruan: p = .616, η_p^2 = .02; *pain catastrophizing*: p = .763, η_p^2 = .01). Efek utama rawatan ke atas kemurungan adalah sangat lemah (p = .939, η_p^2 = .01).

Kesimpulan

Kajian ini menunjukkan bahawa pra-rakaman hipnosis adalah sejenis rawatan yang berkesan bagi mengurangkan tahap kecelaruan dan *pain catastrophizing* sepanjang tempoh peri-pembedahan. Walau bagaimanapun, pengurangan tahap kecelaruan dan

pain catastrophizing tidak menunjukkan pesakit mendapat kelegaan sakit yang berbeza di kalangan sampel kajian ini, jika dibandingkan dengan kumpulan yang menerima rawatan seperti biasa. Kajian selanjutnya diperlukan untuk mengenalpasti mekanisme di mana faktor risiko menyumbang kepada CPSP, and cara-cara yang lebih efektif untuk mencegahan CPSP.

Kata kunci: Hipnosis klinikal, kesakitan kronik pos-pemedahan, penjagaan peri-pembedahan, kajian rawak terkawal, rawatan penggantian lutut total

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

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This is to confirm that:

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LIST OF ABBREVIATIONS

ACC	Anterior Cingulate Cortex
ACT	Acceptance-Based Therapy
ANOVA	Analysis of variance
APA	American Psychological Association
APSP	Acute Post-Surgical Pain
BMA	British Medical Association
BPI	Brief Pain Inventory
CBT	Cognitive-Behavioral Therapy
CNS	Central Nervous System
CPSP	Chronic Post-Surgical Pain
DASS	Depression Anxiety Stress Scale
GA	General Anesthesia
HADS	Hospital Anxiety and Depression Scale
HSSS	Hospital for Special Surgery Scale
HYP	Clinical Hypnosis
IASP	International Association for the Study of Pain
KSS	Knee Society Score
MET	Minimal-Effect Treatment
MMPI	Minnesota Multiphasic Personality Inventory
MOH	Ministry of Health
NRS	Numerical Rating Scale
NSAIDs	Nonsteroidal Anti-Inflammatory Drugs
PCA	Patient-Controlled Analgesia
PCS	Pain Catastrophizing Scale
PFH	Pain Free Hospital
PPSP	Persistent Post-Surgical Pain
PRSS	Pain-Related Self-Statement
QALY	Quality-Adjusted Life Years
RA	Regional Anesthesia
rACC	Rostral Anterior Cingulate Cortex
rCBF	Regional Cerebral Blood Flow
RCT	Randomized Controlled Trial
SF-36	Short Form 36
TAU	Treatment as Usual
TKA	Total Knee Arthroplasty
TKR	Total Knee Replacement
VAS	Visual Analogue Scale
WOMAC	Western Ontario and McMaster Universities Arthritis Scales
χ^2	Chi-Square

CHAPTER 1

INTRODUCTION

1.1 Background

1.1.1 Total Knee Replacement

Total knee replacement (TKR), also known as total knee arthroplasty (TKA), is the replacement of the knee joint with a prosthesis. This reconstructive surgery is performed when damage that causes pain and dysfunction to the knee is irreversible, such as damage caused by primary arthrosis (e.g. osteoarthritis, ankylosing spondylitis, and rheumatoid arthritis) or other secondary causes (e.g. trauma and musculoskeletal injury) (Walker, 2012). From 1991 to 2010, the volume of primary TKR (knee replacement surgery for the first time, as opposed to revision surgery) performed annually in the United States had increased 162% (from 93,000 to 243,000 approximately), and has become one of the most frequently performed major surgeries (Cram et al., 2012). In Malaysia, TKR is also commonly performed for knees affected by osteoarthritis and rheumatoid arthritis (Ahmad Hafiz, Masbah, & Ruslan, 2011).

The clinical efficacy and cost-effectiveness of TKR is well established. A systematic review of 62 studies published from 1995 to 2003 that included pre- and post-surgery functional data, concluded that TKR had large beneficial effects on several widely accepted outcome measures such as the Knee Society Score (KSS), the Hospital for Special Surgery Scale (HSSS), the Western Ontario and McMaster Universities Arthritis Scales (WOMAC), and the Short Form 36 (SF-36) (Kane, Saleh, Wilt, Bershadsky, & Cross, 2003). A more recent systematic review which included 19 studies with at least three years of follow up that were published from year 2000 onwards also found that patients who underwent TKR showed marked improvements from baseline in the measures such as WOMAC, KSS, pain, and functioning (Shan, Shan, Suzuki, Nouh, & Saxena, 2015).

Annual report data from six countries (i.e., Australia, Denmark, Finland, New Zealand, Norway, & Sweden) indicated only a 6% revision rate after five years and a 12% revision rate after 10 years; these data indicate that the surgery can be viewed as highly successful (Labek, Thaler, Janda, Agreiter, & Stöckl, 2011). A cost-effectiveness analysis based on data from the United Kingdom suggested that TKR costs less than £6,000 per quality-adjusted life years (QALY) gained, and thus represent very good value for money to the national healthcare system (Dakin, Gray, Fitzpatrick, MacLennan, & Murray, 2012).

1.1.2 Chronic Post-Surgical Pain

With such strong evidence supporting the clinical benefits of TKR, it is likely that the volume and demand of this surgery will continue to increase in the years to come. Like any other surgery, however, chronic post-surgical pain (CPSP) can result from TKR (De Kock, 2009). Traditionally, CPSP has been defined as pain that: (1) develops after a surgical procedure, (2) persists for at least 2 months, (3) is not better explained by causes other than the surgery, and (4) is not merely a continuation of a preexisting problem (Macrae & Davies, 1999). Although this definition of CPSP is the most common found in the existing literature, it has also been criticized as overly simplistic (Gupta, Gandhi, Viscusi, 2011; Kehlet & Rathmell, 2010; Schug & Pogatzki-Zahn, 2011). Specifically, as opposed to chronic pain which has been traditionally defined as pain that persists beyond the time it takes for tissue to heal from an injury (usually 3 - 6 months post-injury), the timeframe of 2 months for CPSP may be insufficient to rule out post-surgical pain that could potentially resolve, such as pain due to an ongoing inflammatory response following surgery. Furthermore, the differentiation between a preexisting pain and a new pain is often difficult in practice. Hence, in the context of the current study, CPSP is defined as pain that persists for 6 months or longer following surgery.

Although acute pain following surgery is not unexpected, when it persists and becomes chronic, its implications and treatment become far more complicated (Katz & Seltzer, 2009). Like any chronic pain condition, CPSP not only interferes with individuals' biopsychosocial functioning, but also presents a major economic burden for the society (Blyth, Macfarlane, & Nicholas, 2007; Gupta, Gandhi, Viscusi, 2011). Chronic pain of any type can contribute to physical disability (Turner et al., 2004), significant emotional distress (Greenwood, Thurston, Rumble, Waters, & Keefe, 2003; Wegener, Castillo, Haythornthwaite, MacKenzie, & Bosse, 2011), family problems (Payne & Norfleet, 1986; Turk, Flor, & Rudy, 1987), occupational dysfunction (Blyth, March, Nicholas, & Cousins, 2003; Gheldof, Vinck, Vlaeyen, Hidding, & Crombez, 2005; Martel, Wideman, & Sullivan, 2012), challenges in activities of daily living (Amris, Wæhrens, Jespersen, Bliddal, & Danneskiold-Samsøe, 2011), and financial difficulties (Schofield et al., 2012).

On a societal level, chronic pain can result in significant costs due to the cost of care as well as loss of productivity (Phillips, 2006). Therefore, while a significant number of individuals are likely to benefit from TKR, the incidence of CPSP as well as the amount of burden and suffering associated with chronic pain may grow as the volume of TKR increases, especially if the risks of developing CPSP have not been adequately addressed. This view has been supported by many investigators and clinicians that highlighted the importance of prevention in dealing with CPSP (e.g. Burns & Moric, 2011; Gupta, Gandhi, Viscusi, 2011; Macrae, 2008; Niraj & Rowbotham, 2011; Schug & Pogatzki-Zahn, 2011).

1.2 Problem Statement

Despite the potential benefits of TKR in reducing pain and improving functioning, there is a 10% to 50% probability that individuals undergoing the surgery may develop CPSP (Kehlet, Jensen, & Woolf, 2006). One large scale survey conducted in England and Wales found that 20% of patients (n = 8010) who underwent TKR continued to experience persistent pain after one year (Baker, Van der Meulen, Lewsey, Gregg, 2007). A systematic review that examined the proportion of patients experiencing chronic pain after joint replacement also found that about 20% of patients have unfavourable long-term (up to five years) pain outcomes after TKR (Beswick, Wylde, Gooberman-Hill, Blom, & Dieppe, 2012). This estimation suggests that one out of five patients ungoing TKR continue suffer from pain and its negative consequences long after the surgery.

A number of biological, psychological, and social factors have been identified as predictors of post-surgical pain in TKR. On top of the emerging findings which indicated that pre-surgical psychological distress is associated with poor post-surgical outcomes in joint replacement surgery (Howard, Ellis, & Khaleel, 2010), previous research has also identified pain, depression, and anxiety during the pre-surgical period as significant predictors for pain at 6 months in patients who have undergone TKR (Judge et al., 2012). Notwithstanding the growing knowledge about its predictors, the prevention of CPSP leaves much room for improvement (Pogatzki-Zahn, Schnabel, & Zahn, 2012).

Many clinicians and researchers are now aware of the psychosocial aspects of pain and have moved towards a biopsychosocial approach to the management of chronic pain (Domenech, Sánchez-Zuriaga, Segura-Ortí, Espejo-Tort, & Lisón, 2011), but the use of psychosocial techniques to prevent CPSP is not yet part of the standard surgical care (Burns & Moric, 2011). Most of the proposed preventive measures have focused on the biomedical aspects of surgery, such as employing less invasive surgical techniques (e.g. laparoscopic surgery), use of preemptive analgesia, and use of multimodal analgesia (Bouman et al., 2014; Buvanendran, 2008; Buvanendran & Kroin, 2009; Kehlet et al., 2006; Pogatzki -Zahn et al., 2012). However, the previous findings also suggested that psychological factors such as depression, anxiety, and catastrophizing experienced by the patients before and after surgery may play important causal roles in the development of CPSP. Therefore, interventions that target these dimensions may also reduce the risk of developing CPSP.

Consistent with this idea, research indicates that a number of psychotherapeutic modals such as Acceptance-Based Therapy (ACT; Fernández, Luciano, & Valdivia-Salas, 2012), Cognitive-Behavioral Therapy (CBT; Riddle et al., 2010), music therapy (Binns-Turner, Wilson, Pryor, Boyd, & Prickett, 2011; Nilsson, Rawal, Unestål, Zetterberg, & Unosson, 2001; Nilsson, Rawal, Enqvist, & Unosson, 2003), and clinical hypnosis (Montgomery et al., 2007; Saadat et al., 2006) to be effective in alleviating surgical-related pain and distress. Apart from CBT which is usually

structured and conducted in a course of several sessions (Riddle et al., 2010), other psychological interventions are typically cost-effective and can be easily incorporated into daily practice.

For example, Fernández and colleague (2012) have showed that patients awaiting laparoscopic cholecystectomy who were given a 30-minute ACT session to address their perceptions regarding the surgery resulted in lesser demand of analgesics and earlier hospital discharge after the surgery. Patients undergoing mastectomy for breast cancer who listened to soft and comforting music throughout the peri-surgical period were found to have lower anxiety and pain scores, as well as lower blood pressure levels (Binns-Turner et al., 2011). Montgomery and colleagues (2007) demonstrated that patients who received a 15-minutes pre-surgery hypnosis session experienced significantly less post-surgical pain intensity, pain unpleasantness, nausea, fatigue, discomfort, and emotional distress after surgery as compared to those in the control group. As a group, these findings provided strong support for the role of simple and brief psychological interventions in the surgical setting.

Powell and colleagues (2016) published a Cochrane review that included 105 studies on psychological preparation for adults undergoing surgery under general anesthesia. The authors categorized the different psychological preparation methods into: (1) providing procedural information, (2) providing sensory information, (3) behavioral instruction, (4) cognitive interventions, (5) relaxation techniques, (6) hypnosis, and (7) emotion-focused interventions. Their findings suggest that the psychological preparation methods tend to have comparable effects, and were associated with lower post-surgical pain, shorter length of stay, and lower negative affect when compared with controls.

Despite the potential for psychological interventions to reduce the incidence and severity of CPSP, there is limited evidence from randomized clinical trial in that regard. By conceptually mapping the effects of CBT on reducing catastrophizing and catastrophizing on predicting pain through the calculation of effect sizes, Burns and Moric (2011) were able to estimate that treating patients with high catastrophizing with CBT may prevent 50% of them from developing CPSP, with a CBT effect size of Cohen's d = 0.63 on catastrophizing. Such promising estimations, albeit theoretically derived, indicate that testing of psychotherapeutic interventions to prevent CPSP is clearly warranted.

1.3 Significance of the Study

The current study was an attempt to incorporate clinical hypnosis, one of the oldest form psychotherapy that has a particular relevance to the field of anesthesia and surgery (Spiegel, 2006), to the surgical care setting to reduce the risk of CPSP. The treatment protocol developed in this study can be adopted as a routine care strategy to help manage pain and psychological distress in patient undergoing TKR, and can

perhaps be adapted into other surgical modalities. A comparison of predictors in two surgical models that differ considerably (i.e. TKR and breast surgery) suggested that anxiety, pain catastrophizing, and intense acute post-surgical pain (APSP) are predictors of CPSP in both types of surgery, and that psychological predictors may be consistent across multiple surgical model (Masselin-Dubois et al., 2013). The preventive treatment of CPSP, if successful, can reduce the cost and suffering brought about by chronic pain. Besides potentially mitigating the risk of CPSP, the intervention may help patients better cope with the surgical environment, which on its own can be meaningful to the patients.

Given that very few studies in Malaysia have examined hypnotic intervention for surgical care using RCT, the current study may set off a research line of hypnosis for clinical applications in the local context. Results of this study can serve as a reference for future studies that examine the effects of hypnosis or other psychological treatment in reducing post-surgical pain, depression, anxiety, and pain catastrophizing.

1.4 Objectives

The current study examined the efficacy of hypnosis as a potential preventive treatment for CPSP using a randomized controlled trial (RCT) design. As patients' pain intensity and psychological states prior to the surgery have been found to significantly predict post-surgical outcomes, it is likely that initiating hypnotic interventions during the pre-surgical (as opposed to only during the post-operative period) may yield the best outcomes.

1.4.1 General Objectives

The general objective of this study was to develop, implement, and evalute a peri-surgical hypnotic intervention to alleviate the clinical and psychological risks of CPSP.

1.4.2 Specific Objectives

The specific objectives of the study include:

1. To describe the demographic background as well as the levels of pain, anxiety, depression, and pain catastrophizing of individuals going for TKR in the General Hospital of Kuala Lumpur (GHKL).

2. To develop a hypnotic intervention that can be incorporated into the peri-surgical care process.

3. To compare the hypnotic intervention against standard care (treatment-as-usual; TAU) and an intervention that controls for both time and therapist attention (minimal-effect treatment (MET).

4. To determine the efficacy of peri-surgical hypnotic intervention in providing immediate pain relief by comparing against TAU and MET.

5. To determine the efficacy of peri-surgical hypnotic intervention in reducing pain intensity during the first 72-hour post-surgical period by comparing against TAU and MET.

6. To determine the efficacy of peri-surgical hypnotic intervention in reducing anxiety, depression, and pain catastrophizing during the peri-surgical period by comparing against TAU and MET.

7. To determine the efficacy of peri-surgical hypnotic intervention in reducing pain intensity during 1-month, 3-month, and 6-month follow up by comparing against TAU and MET.

1.5 Hypotheses

1. Peri-surgical hypnotic intervention provides significant pain reduction relative to TAU and MET within an hour after administration.

2. Peri-surgical hypnotic intervention significantly reduces pain intensity during the first 72 hours post-surgery as compared to TAU and MET.

3. Peri-surgical hypnotic intervention significantly reduces anxiety throughtout the peri-surgical period as compared to TAU and MET.

4. Peri-surgical hypnotic intervention significantly reduces depression throughtout the peri-surgical period as compared to TAU and MET.

5. Peri-surgical hypnotic intervention significantly reduces pain catastrophizing throughtout the peri-surgical period as compared to TAU and MET.

6. Peri-surgical hypnotic intervention significantly reduces pain intensity at 1-month, 3-months, and 6-months follow up as compared to TAU and MET.

7. Peri-surgical hypnotic intervention significantly reduces the incidence of CPSP at 6-months follow up as compared to TAU and MET.

1.6 Operational Definitions

Risks of CPSP: Experiencing moderate pain intensity for more than a week together with moderate level(s) of anxiety, depression, and pain catastrophizing prior to surgery.

Clinical hypnosis: A psychotherapeutic approach characterized by the use of verbal suggestions to elicit cognitive, behavioural, and emotional changes in a subject.

Minimal-effect treatment: A control group used in clinical trials that resembles the target treatment but without the specific core components.

Treatment as usual: Standard care where no additional therapeutic intervention is given.

Immediate pain relief: The reduction in pain intensity immediately after the implementation of an intervention.

Acute post-surgical pain: The average pain intensity in the first 72 hours after surgery.

Chronic post-surgical pain: Pain that persists for 6 months or longer following surgery.

Peri-surgical: The period throughout the surgery, beginning from admission until discharge.

Anxiety: Fear-related experience as measured by standardized psychometric instruments.

Depression: Sadness-related experience as measured by standardized psychometric instruments.

Pain catastrophizing: The tendency to exaggerate the negativity of an actual or anticipated pain experience as measured by standardized psychometric instruments.

REFERENCES

Ahmad Hafiz, Z., Masbah, O., & Ruslan, G. (2011). Total knee replacement: 12 years retrospective review and experience. *Malaysian Orthopaedic Journal, 5*(1), 34-39.

Aisyaturridha, A., Naing, L., & Nizar, A. J. (2006). Validation of the Malay Brief Pain Inventory questionnaire to measure cancer pain. *Journal of pain and symptom management, 31*(1), 13-21.

Alcelik, I., Pollock, R. D., Sukeik, M., Bettany-Saltikov, J., Armstrong, P. M., & Fismer, P. (2012). A comparison of outcomes with and without a tourniquet in total knee arthroplasty: A systematic review and meta-analysis of randomized controlled trials. *Journal of Arthroplasty, 27*(3), 331-340.

Alcelik, I., Sukeik, M., Pollock, R., Misra, A., Shah, P., Armstrong, P., & Dhebar, M. I. (2012). Comparison of the minimally invasive and standard medial parapatellar approaches for primary total knee arthroplasty. *Knee Surgery, Sports Traumatology, Arthroscopy, 20*(12), 2502-2512.

Alden, P. & Heap, M. (1998). Hypnotic pain control: Some theoretical and practical issues. *International Journal of Clinical and Experimental Hypnosis, 46*(1), 62-76.

Allen, J., & Annells, M. (2009). A literature review of the application of the Geriatric Depression Scale, Depression Anxiety Stress Scales and Post-Traumatic Stress Disorder Checklist to community nursing cohorts. *Journal of clinical nursing, 18*(7), 949-959.

American Psychiatric Association (2013). Diagnostic and statistical manual of mental disorders (DSM-5®). *American Psychiatric Pub*.

Amris, K., Wæhrens, E. E., Jespersen, A., Bliddal, H., & Danneskiold-Samsøe, B. (2011). Observation-based assessment of functional ability in patients with chronic widespread pain: A cross-sectional study. *Pain*, *152*(11), 2470–2476.

Ashton, R. C., Whitworth, G. C., Seldomridge, J. A., Shapiro, P. A., Michler, R. E., Smith, C. R., . . . Oz, M. C. (1995). The effects of self-hypnosis on quality of life following coronary artery bypass surgery: Preliminary results of a prospective, randomized trial. *The Journal of Alternative and Complementary Medicine, 1*(3), 285-290.

Asmundson, G. J., & Katz, J. (2009). Understanding the co-occurrence of anxiety disorders and chronic pain: State-of-the-art. *Depression and anxiety, 26*(10), 888-901.

Bae, D. K. & Song, S. J. (2011). Computer assisted navigation in knee arthroplasty. *Clinics in Orthopedic Surgery, 3*(4), 259-267.

Bair, M. J., Robinson, R. L., Katon, W., & Kroenke, K. (2003). Depression and pain comorbidity: A literature review. *Archives of Internal Medicine, 163*(20), 2433-2445.

Baker, P. N., Van der Meulen, J. H., Lewsey, J., & Gregg, P. J. (2007). The role of pain and function in determining patient satisfaction after total knee replacement data from the National Joint Registry for England and Wales. *Journal of Bone & Joint Surgery, British Volume, 89*(7), 893-900.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological review, 84*(2), 191.

Barber, J. (1997). Hypnosis and memory: A hazardous connection. *Journal of Mental Health Counseling, 19*(4), 305-317.

Barber, J. (1998). When hypnosis causes trouble. *International Journal of Clinical and Experimental Hypnosis, 46*(2), 157-170,

Barrack, R. L., Schrader, T., Bertot, A. J., Wolfe, M. W., & Myers, L. (2001). Component rotation and anterior knee pain after total knee arthroplasty. *Clinical Orthopaedics and Related Research, 392*, 46-55.

Bauwens, K., Matthes, G., Wich, M., Gebhard, F., Hanson, B., Ekkernkamp, A., & Stengel, D. (2007). Navigated total knee replacement: A meta-analysis. *Journal of Bone and Joint Surgery - Series A, 89*(2), 261-269.

Bell, S. W., Young, P., Drury, C., Smith, J., Anthony, I., Jones, B., . . . McLean, A. (2014). Component rotational alignment in unexplained painful primary total knee arthroplasty. *The Knee, 21*(1), 272-277.

Bellomo, R., Warrillow, S. J., & Reade, M. C. (2009). Why we should be wary of single-center trials. *Critical Care* Medicine, 37(12), 3114-3119.

Bentall, R. (2000). Hypnotic and psychotic hallucinations: Rich data capable of multiple interpretations. *Contemporary Hypnosis, 17*(1), 21.

Berend, K. R., Morris, M. J., Skeels, M. D., Lombardi, A. V., & Adams, J. B. (2011). Perioperative complications of simultaneous versus staged unicompartmental knee arthroplasty. *Clinical Orthopaedics and Related Research, 469*(1), 168-173.

Beswick, A. D., Wylde, V., Gooberman-Hill, R., Blom, A., & Dieppe, P. (2012). What proportion of patients report long-term pain after total hip or knee replacement for osteoarthritis? A systematic review of prospective studies in unselected patients. *BMJ open*, *2*(1), e000435.

Binns-Turner, P. G., Wilson, L. L., Pryor, E. R., Boyd, G. L., & Prickett, C. A. (2011). Perioperative music and its effects on anxiety, hemodynamics, and pain in women undergoing mastectomy. *Arthroscopy Association of North America, 79*(4), S21-S27.

Bjelland, I., Dahl, A. A., Haug, T. T., & Neckelmann, D. (2002). The validity of the Hospital Anxiety and Depression Scale: An updated literature review *Journal of Psychosomatic Research, 52*(2), 69-77.

Bjornsson, A. S. (2011). Beyond the "psychological placebo": Specifying the nonspecific in psychotherapy. *Clinical Psychology: Science and Practice, 18*(2), 113-118.

Blankfield, R. P., Zyzanski, S. J., Flocke, S. A., Alemagno, S., & Scheurman, K. (1995). Taped therapeutic suggestions and taped music as adjuncts in the care of coronary-artery-bypass patients. *American Journal of Clinical Hypnosis, 37*(3), 32-42.

Blyth, F. M., Macfarlane, G. J., & Nicholas, M. K. (2007). The contribution of psychosocial factors to the development of chronic pain: The key to better outcomes for patients? *Pain, 129*(1), 8–11.

Blyth, F. M., March, L. M., Nicholas, M. K., & Cousins, M. J. (2003). Chronic pain, work performance and litigation. *Pain, 103*(1), 41–47.

Bo, Z. d., Liao, L., Zhao, J. m., Wei, Q. j., Ding, X. f., & Yang, B. (2013). Mobile bearing or fixed bearing? A meta-analysis of outcomes comparing mobile bearing and fixed bearing bilateral total knee replacements. *The Knee, 21*(2) 374-381.

Bonutti, P. M., Mont, M. A., McMahon, M., Ragland, P. S., & Kester, M. (2004). Minimally invasive total knee arthroplasty. *Journal of Bone and Joint Surgery, 86*, 26-32.

Bouman, E. A., Theunissen, M., Bons, S. A., van Mook, W. N., Gramke, H. F., van Kleef, M., & Marcus, M. A. (2014). Reduced incidence of chronic postsurgical pain after epidural analgesia for abdominal surgery. *Pain Practice*, 14(2), E76-E84.

Brander, V. A., Stulberg, S. D., Adams, A. D., Harden, R. N., Bruehl, S., Stanos, S. P., & Houle, T. (2003). Predicting total knee replacement pain: A prospective, observational study. *Clinical Orthopaedics and Related Research, 416*(27-36).

Brander, V., Gondek, S., Martin, E., & Stulberg, S. D. (2007). Pain and depression influence outcome 5 years after knee replacement surgery. *Clinical Orthopaedics and Related Research, 464*, 21-26.

Breivik, H. & Bond, M. (2004). Why pain control matters in a world full of killer diseases. *Pain: Clinical Updates, 12*(4), 1-4.

Breivik, H., Collett, B., Ventafridda, V., Cohen, R., & Gallacher, D. (2006). Survey of chronic pain in Europe: Prevalence, impact on daily life, and treatment. *European Journal of Pain, 10*(4), 287-333.

British Medical Association Report. (1955). Medical use of hypnotism. *British Medical Journal, 1* (Suppl.), 190–193.

Burnett, R. S. & Barrack, R. L. (2013). Computer-assisted total knee arthroplasty is currently of no proven clinical benefit: A systematic review. *Clinical Orthopaedics and Related Research, 471*(1), 264-276.

Burns, J. W., & Moric, M. (2011). Psychosocial factors appear to predict postoperative pain: Interesting, but how can such information be used to reduce risk? *Techniques in Regional Anesthesia and Pain Management, 15*(3), 90-99.

Burns, J. W., Day, M. A., & Thorn, B. E. (2012). Is reduction in pain catastrophizing a therapeutic mechanism specific to cognitive-behavioral therapy for chronic pain? *Translational Behavioral Medicine, 2*(1), 22-29.

Burns, L., Ritvo, S., Ferguson, M., Clarke, H., Seltzer, Z. E., & Katz, J. (2015). Pain catastrophizing as a risk factor for chronic pain after total knee arthroplasty: A systematic review. *Journal of Pain Research, 8*, 21-32.

Busch, V., Magerl, W., Kern, U., Haas, J., Hajak, G., & Eichhammer, P. (2012). The effect of deep and slow breathing on pain perception, autonomic activity, and mood processing - an experimental study. *Pain Medicine, 13*(2), 215-228.

Buvanendran, A. (2008). Regional anesthesia and analgesia: Prevention of chronic pain. *Techniques in Regional Anesthesia and Pain Management, 12*(4), 199-202.

Buvanendran, A., & Kroin, J. (2009). Multimodal analgesia for controlling acute postoperative pain. *Current Opinion in Anesthesiology, 22*(5), 588-593.

Cardosa, M., Zubaidah, J.O., Nicholas, M., Tonkin, L., Williams, A., Khuzaimah, A.A., Ramli, M.A., &Norhana, M.D. (2012). Self-management of chronic pain in Malaysian patients: Effectiveness trial with 1-year follow-up. *Translational Behavioural Medicine, 2*, 30–37.

Carpenter, J. J., Hines, S. H., & Lan, V. M. (2016). Guided imagery for pain management in postoperative orthopedic patients an integrative literature review. *Journal of Holistic Nursing, 0898010116675462*.

Caseley-Rondi, G., Merikle, P.M., & Bowers, K.S. (1994). Unconscious cognition in the context of general anesthesia. *Consciousness & Self-Regulation, 3*, 166-195.

Castel, A., Pérez, M., Sala, J., Padrol, A., & Rull, M. (2007). Effect of hypnotic suggestion on fibromyalgic pain: Comparison between hypnosis and relaxation. *European Journal of Pain, 11*(4), 463-468.

Cepeda, M. S., Carr, D. B., Lau, J., & Alvarez, H. (2006). Music for pain relief. *Cochrane Database of Systematic Reviews, 2*(2).

Cheng, M., Chen, D., Guo, Y., Zhu, C., & Zhang, X. (2013). Comparison of fixed- and mobile-bearing total knee arthroplasty with a mean five-year follow-up: A meta-analysis. *Experimental and Therapeutic Medicine, 6*(1), 45-51.

Cheng, T., Zhao, S., Peng, X., & Zhang, X. (2012). Does computer-assisted surgery improve postoperative leg alignment and implant positioning following total knee arthroplasty? A meta-analysis of randomized controlled trials? *Knee Surgery, Sports Traumatology, Arthroscopy, 20*(7), 1307-1322.

Cheseaux, N., de Saint Lager, A. J., & Walder, B. (2014). Hypnosis before diagnostic or therapeutic medical procedures: A systematic review. *International Journal of Clinical and Experimental Hypnosis, 62*(4), 399-424.

Cho, S., Kim, H.-Y., & Lee, J.-H. (2012). Validation of the Korean version of the Pain Catastrophizing Scale in patients with chronic non-cancer pain. *Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care and Rehabilitation, 22*(7), 1767-1772.

Choong, P. F. M. (2012). Tourniquet use in knee replacement surgery: What is the evidence? *ANZ Journal of Surgery, 82*(6), 384-385.

Cisler, J. M., Olatunji, B. O., Feldner, M. T., & Forsyth, J. P. (2010). Emotion regulation and the anxiety disorders: An integrative review. *Journal of psychopathology and behavioral assessment, 32*(1), 68-82.

Cleeland, C. S. (2009). *The brief pain inventory user guide*. Houston, TX: The University of Texas MD Anderson Cancer Center.

Cleghorn, J. M., Franco, S., Szechtman, B., Kaplan, R. D., Szechtman, H., Brown, G. M., . . . Garnett, E. S. (1992). Toward a brain map of auditory hallucinations. *The American Journal of Psychiatry, 149*(8), 1062-1069.

Cleghorn, J. M., Garnett, E. S., Nahmias, C., Brown, G. M., Kaplan, R. D., Szechtman, H., . . . Cook, P. (1990). Regional brain metabolism during auditory hallucinations in chronic schizophrenia. *The British Journal of Psychiatry, 157*, 562-570.

Cochran, W. G. (1952). The $\chi 2$ test of goodness of fit. *The Annals of Mathematical Statistics, 23*(3), 315-345.

Cram, P., Lu, X., Kates, S. L., Singh, J. A., Li, Y., & Wolf, B. R. (2012). Total knee arthroplasty: Volume, utilization, and outcomes among Medicare beneficiaries, 1991-2010. *Journal of American Medical Association, 308*(12).

Cramer, H., Lauche, R., Paul, A., Langhorst, J., Kummel, S., & Dobos, G. J. (2014). Hypnosis in breast cancer care: A systematic review of randomized controlled trials. *Integrative Cancer Therapies, 14*(1), 5-15.

Czurda, T., Fennema, P., Baumgartner, M., & Ritschl, P. (2010). The association between component malalignment and post-operative pain following navigation-assisted total knee arthroplasty: Results of a cohort/nested case-control study. *Knee Surgery, Sports Traumatology, Arthroscopy, 18*(7), 863-869.

Dakin, H., Gray, A., Fitzpatrick, R., MacLennan, G., & Murray, D. (2012). Rationing of total knee replacement: A cost-effectiveness analysis on a large trial data set. *BMJ open, 2*(1).

Daltroy, L. H., Morlino, C. I., Eaton, H. M., Poss, R., & Liang, M. H. (1998). Preoperative education for total hip and knee replacement patients. *Arthritis Care and Research, 11*(6).

de Boer, M. R., Waterlander, W. E., Kuijper, L. D., Steenhuis, I. H., & Twisk, J. W. (2015). Testing for baseline differences in randomized controlled trials: An unhealthy research behavior that is hard to eradicate. *International Journal of Behavioral Nutrition and Physical Activity, 12*(1), 4.

de Klerk, J. E., du Plessis, W. F., Steyn, H. S., & Botha, M. (2004). Hypnotherapeutic ego strengthening with male South African coronary artery bypass patients. *American Journal of Clinical Hypnosis, 47*(2), 79-92.

De Kock, M. (2009). Expanding our horizons: Transition of acute postoperative pain to persistent pain and establishment of chronic postsurgical pain services. *Anesthesiology, 111*(3), 461-463.

Demyttenaere, K., Bruffaerts, R., Lee, S., Posada-Villa, J., Kovess, V., Angermeyer, M. C., . . . Lara, C. (2007). Mental disorders among persons with chronic back or neck pain: Results from the World Mental Health Surveys. *Pain, 129*(3), 332-342.

Desai, A. S., Dramis, A., Kendoff, D., & Board, T. N. (2011). Critical review of the current practice for computer-assisted navigation in total knee replacement surgery: Cost-effectiveness and clinical outcome. *Current Reviews in Musculoskeletal Medicine, 4*(1), 11-15.

Dienes, Z., Brown, E., Hutton, S., Kirsch, I., Mazzoni, G., & Wright, D. B. (2009). Hypnotic suggestibility, cognitive inhibition, and dissociation. *Consciousness and Cognition, 18*(4), 837–847.

Domenech, J., Sánchez-Zuriaga, D., Segura-Ortí E., Espejo-Tort, B., & Lisón, J. F. (2011). Impact of biomedical and biopsychosocial training sessions on the attitudes, beliefs, and recommendations of health care providers about low back pain: A randomised clinical trial. *Pain, 152*(11), 2557–2563.

Drahovzal, D. N., Stewart, S. H., & Sullivan, M. J. (2006). Tendency to catastrophize somatic sensations: Pain catastrophizing and anxiety sensitivity in predicting headache. *Cognitive Behaviour Therapy, 35*(4), 226-235.

Eimer, B. N. (2012). Inadvertent adverse consequences of clinical and forensic hypnosis: Minimizing the risks. *American Journal of Clinical Hypnosis, 55*(1), 8-31.

Endler, N. S., & Kocovski, N. L. (2001). State and trait anxiety revisited. *Journal of Anxiety Disorders, 15*(3), 231-245.

Enqvist, B. & Fischer, K. (1997). Preoperative hypnotic techniques reduce consumption of analgesics after surgical removal of third mandibular molars. International *Journal of Clinical & Experimental Hypnosis, 45*(2), 102-108.

Enqvist, B., von Konow, L., & Bystedt, H. (1995). Pre- and perioperative suggestion in maxillofacial surgery: Effects on blood loss and recovery. *International Journal of Clinical & Experimental Hypnosis, 43*(3), 284-294.

Erdelyi, M. H. (2010). The ups and downs of memory. *American Psychologist, 65*(7), 623-633.

Ewin, D. M. (2008). Death and hypnosis: Two remarkable cases. *American Journal of Clinical Hypnosis, 51*(1), 69-75.

Faw, V., Sellers, D. J., & Wilcox, W. W. (1968). Psychopathological effects of hypnosis. *International Journal of Clinical and Experimental Hypnosis, 16*(1), 26-37.

Faymonville, M. E., Boly, M., & Laureys, S. (2006). Functional neuroanatomy of the hypnotic state. *Journal of Physiology Paris, 99*(4-6), 463-469.

Faymonville, M.E., Fissette, J., Mambourg, P.H., Roediger, L., Joris, J., & Lamy, M. (1995). Hypnosis as adjunct therapy in conscious sedation for plastic surgery. *Regional Anesthesia, 20*(2), 145-151.

Faymonville, M.E., Mambourg, P.H., Joris, J., Vrigens, B., Fissette, J., Albert, A., & Lamy, M. (1997). Psychological approaches during conscious sedation. Hypnosis versus stress reducing strategies: A prospective randomized study. *Pain, 73*(3), 361-367.

Fernandes, L., Storheim, K., Lochting, I., & Grotle, M. (2012). Cross-cultural adaptation and validation of the Norwegian pain catastrophizing scale in patients with low back pain. *BMC Musculoskeletal Disorders, 13*, 111-111.

Fernández, M. D., Luciano, C., & Valdivia-Salas, S. (2012). Impact of acceptance-based Nursing intervention on postsurgical recovery: Preliminary findings. *Spanish Journal of Psychology, 15*(3), 1361-1370.

Fine, P. G. (2011). Long-term consequences of chronic pain: Mounting evidence for pain as a neurological disease and parallels with other chronic disease states. *Pain Medicine, 12*(7), 996-1004.

Flammer, E. & Bongartz, W. (2003). On the efficacy of hypnosis: A meta-analytic study. *Contemporary Hypnosis, 20*(4), 179-197.

Flood, A. B., Lorence, D. P., Ding, J., McPherson, K., & Black, N. A. (1993). The role of expectations in patients' reports of post-operative outcomes and improvement following therapy. *Medical Care, 31*(11), 1043-1056.

Flor, H., Behle, D.J., Birbaumer, N. (1993). Assessment of pain related cognitions in chronic pain patients. *Behaviour Research and Therapy, 31*, 63-73.

Flory, N., Salazar, G. M. M., & Lang, E. V. (2007). Hypnosis for acute distress management during medical procedures. *International Journal of Clinical and Experimental Hypnosis, 55*(3), 303-317.

French, D. P., & Sutton, S. (2010). Reactivity of measurement in health psychology: how much of a problem is it? What can be done about it? *British journal of health psychology, 15*(3), 453-468.

Frischholz, E. J. & Scheflin, A. W. (2009). A comment on an alleged association between hypnosis and death: Two remarkable cases. *American Journal of Clinical Hypnosis, 52*(1), 45-67.

Frueh, W. & Sharkey, P. (2004). The standard anterior medial parapatellar approach to TKA. In W. Hozack, M. Krismer, M. Nogler, P. Bonutti, F. Rachbauer, J. Schaffer & W. Donnelly (Eds.), *Minimally Invasive Total Joint Arthroplasty* (pp. 132-138): Springer Berlin Heidelberg.

Fu, D., Li, G., Chen, K., Zeng, H., Zhang, X., & Cai, Z. (2013). Comparison of clinical outcome between simultaneous-bilateral and staged-bilateral total knee arthroplasty: A systematic review of retrospective studies. *Journal of Arthroplasty, 28*(7), 1141-1147.

Fu, Y., Wang, M., Liu, Y., & Fu, Q. (2012). Alignment outcomes in navigated total knee arthroplasty: A meta-analysis. *Knee Surgery, Sports Traumatology, Arthroscopy, 20*(6), 1075-1082.

Gay, M. C., Philippot, P., & Luminet, O. (2002). Differential effectiveness of psychological interventions for reducing osteoarthritis pain: a comparison of Erickson hypnosis and Jacobson relaxation. *European Journal of Pain, 6*(1), 1-16.

Gheldof, E. L. M., Vinck, J., Vlaeyen, J. W. S., Hidding, A., & Crombez, G. (2005). The differential role of pain, work characteristics and pain-related fear in explaining back pain and sick leave in occupational settings. *Pain, 113*(1), 71–81.

Ginandes, C., Brooks, P., Sando, W., Jones, C., & Aker, J. (2003). Can medical hypnosis accelerate post-surgical wound healing? Results of a clinical trial. *American Journal of Clinical Hypnosis, 45*(4), 333-351.

Goossens, M. E., Vlaeyen, J. W., Hidding, A., Kole-Snijders, A., & Evers, S. M. (2005). Treatment expectancy affects the outcome of cognitive-behavioral interventions in chronic pain. *The Clinical Journal of Pain, 21*(1), 18-26.

Granot, M. & Ferber, S. G. (2005). The roles of pain catastrophizing and anxiety in the prediction of postoperative pain intensity: A prospective study. *The Clinical journal of pain, 21*(5), 439-445.

Green, J. P., Barabasz, A., Barrett, D., & Montgomery, G. H. (2005). Forging ahead: The 2003 APA Division 30 definition of hypnosis. *International Journal of Clinical and Experimental Hypnosis, 53*(3), 259-264.

Greenberg, R. P., Constantino, M. J., & Bruce, N. (2006). Are patient expectations still relevant for psychotherapy process and outcome? *Clinical Psychology Review, 26*(6), 657-678.

Greenwood, K. A., Thurston, R., Rumble, M., Waters, S. J., & Keefe, F. J. (2003). Anger and persistent pain: Current status and future directions. *Pain, 103*(1), 1–5.

Gronnier, C., Wattier, J. M., Favre, H., Piessen, G., & Mariette, C. (2012). Risk factors for chronic pain after open ventral hernia repair by underlay mesh placement. *World Journal of Surgery, 36*(7), 1548-1554.

Gruzelier, J. (2000b). Unwanted effects of hypnosis: A review of the evidence and its implications. *Contemporary Hypnosis, 17*(4), 163-193.

Gruzelier, J. H. (2000a). Redefining hypnosis: Theory, methods and integration. *Contemporary Hypnosis, 17*(2), 51.

Gupta, A., Gandhi, K., & Viscusi, E. R. (2011). Persistent postsurgical pain after abdominal surgery. *Techniques in Regional Anesthesia and Pain Management, 15*(3), 140-146.

Gurunathan, U. (2013). Perioperative considerations of bilateral total knee replacement: A review. *Journal of Clinical Anesthesia, 25*(3), 232-239.

Hammond, D. C. (2008). Hypnosis as sole anesthesia for major surgeries: Historical & contemporary perspectives. *American Journal of Clinical Hypnosis, 51*(2), 101-121.

Hammond, D. C. (2010). Hypnosis in the treatment of anxiety-and stress-related disorders. *Expert review of Neurotherapeutics, 10*(2), 263-273.

Harsten, A., Kehlet, H., & Toksvig-Larsen, S. (2013). Recovery after total intravenous general anaesthesia or spinal anaesthesia for total knee arthroplasty: A randomized trial. *British Journal of Anaesthesia, 111*(3), 391-399.

Häuser, W., Hagl, M., Schmierer, A., & Hansen, E. (2016). The efficacy, safety and applications of medical hypnosis: A systematic review of meta-analyses. *Deutsches Ärzteblatt International, 113*(17), 289.

Hawkins, R. M. F. (2001). A systematic meta-review of hypnosis as an empirically supported treatment for pain. *Pain Reviews, 8*(2), 47-73.

Hernandez-Vaquero, D., Noriega-Fernandez, A., & Suarez-Vazquez, A. (2010). Total knee arthroplasties performed with a mini-incision or a standard incision. Similar results at six months follow-up. *BMC Musculoskeletal Disorders, 11*, 27.

Hetaimish, B. M., Khan, M. M., Simunovic, N., Al-Harbi, H. H., Bhandari, M., & Zalzal, P. K. (2012). Meta-analysis of navigation vs conventional total knee arthroplasty. *Journal of Arthroplasty, 27*(6), 1177-1182.

Higashijima, K., Ishida, A., Fukuoka, Y., Hoshino, A., & Minamitani, H. (2002). Kinematic analysis of mobile-bearing and fixed-bearing knee prostheses by simulation. *Medical and Biological Engineering and Computing, 40*(1), 22-28.

Hofmann, S., Romero, J., Roth-Schiffl, E., & Albrecht, T. (2003). Rotational malalignment of the components may cause chronic pain or early failure in total knee arthroplasty. *Der Orthopade, 32*(6), 469-476.

Hollins, M., Harper, D., Gallagher, S., Owings, E. W., Lim, P. F., Miller, V., . . . Maixner, W. (2009). Perceived intensity and unpleasantness of cutaneous and auditory stimuli: An evaluation of the generalized hypervigilance hypothesis. *Pain, 141*(3), 215-221.

Homma, I., & Masaoka, Y. (2008). Breathing rhythms and emotions. *Experimental physiology, 93*(9), 1011-1021.

Howard, K. J., Ellis, H. B., & Khaleel, M. A. (2010). Psychological factors that may influence outcome after joint replacement surgery. *Current Orthopaedic Practice, 21*(2), 144-148.

Hu, J., Liu, Y., Lv, Z., Li, X., Qin, X., & Fan, W. (2011). Mortality and morbidity associated with simultaneous bilateral or staged bilateral total knee arthroplasty: A meta-analysis. *Archives of Orthopaedic and Trauma Surgery, 131*(9), 1291-1298.

Hu, S., Zhang, Z. Y., Hua, Y. Q., Li, J., & Cai, Z. D. (2009). A comparison of regional and general anaesthesia for total replacement of the hip or knee: A meta-analysis. *Journal of Bone & Joint Surgery, British Volume, 91*(7), 935-942.

Huang, C. H., Liau, J. J., & Cheng, C. K. (2007). Fixed or mobile-bearing total knee arthroplasty. *Journal of Orthopaedic Surgery and Research, 2*(1), 1.

Hussain, N., Chien, T., Hussain, F., Bookwala, A., Simunovic, N., Shetty, V., & Bhandari, M. (2013). Simultaneous versus staged bilateral total knee arthroplasty. *HSS Journal: Musculoskeletal Journal of Hospital for Special Surgery, 9*(1), 50-59.

Hróbjartsson, A., Thomsen, A. S. S., Emanuelsson, F., Tendal, B., Hilden, J., Boutron, I., ... & Brorson, S. (2012). Observer bias in randomised clinical trials with binary outcomes: Systematic review of trials with both blinded and non-blinded outcome assessors. *BMJ*, 344, e1119.

Jacobs, W. (2008). Mobile bearing vs fixed bearing prostheses for total knee arthroplasty for post-operative functional status in patients with osteoarthritis and rheumatoid arthritis. *Cochrane Database of Systematic Reviews, 3*.

Jensen, M. P. & Patterson, D. R. (2005). Control conditions in hypnotic-analgesia clinical trials: Challenges and recommendations. *International Journal of Clinical and Experimental Hypnosis, 53*(2), 170-197.

Jensen, M. P. (2011a). Psychosocial approaches to pain management: An organizational framework. *Pain, 152*(4), 717-725.

Jensen, M. P. (2011b). *Hypnosis for chronic pain* management*: Therapist guide*. Oxford University Press.

Jensen, M. P., Adachi, T., Tomé-Pires, C., Lee, J., Osman, Z. J., & Miró, J. (2015). Mechanisms of hypnosis: toward the development of a biopsychosocial model. *International Journal of Clinical and Experimental Hypnosis, 63*(1), 34-75.

Jensen, M. P., Barber, J., Romano, J. M., Hanley, M. A., Raichle, K. A., Molton, I. R., . . . Patterson, D. R. (2009a). Effects of self-hypnosis training and EMG biofeedback relaxation training on chronic pain in persons with spinal-cord injury. *International Journal of Clinical and Experimental Hypnosis, 57*(3), 239-268.

Jensen, M. P., Barber, J., Romano, J. M., Molton, I. R., Raichle, K. A., Osborne, T. L., . . . Patterson, D. R. (2009b). A comparison of self-hypnosis versus progressive muscle relaxation in patients with multiple sclerosis and chronic pain. *International Journal of Clinical and Experimental Hypnosis, 57*(2), 198-221.

Jensen, M. P., McArthur, K. D., Barber, J., Hanley, M. A., Engel, J. M., Romano, J. M., . . . Patterson, D. (2006). Satisfaction with, and the beneficial side effects of, hypnotic analgesia. *International Journal of Clinical and Experimental Hypnosis, 54*(4).

Jensen, M.P. & Karoly, P. (2011). Self-report scales and procedures for assessing pain in adults. In D.C. Turk & R. Melzack (Eds.), *Handbook of pain assessment* (3rd ed., pp.19-44). New York: Guilford Press.

Johansen, A., Romundstad, L., Nielsen, C. S., Schirmer, H., & Stubhaug, A. (2012). Persistent postsurgical pain in a general population: Prevalence and predictors in the Tromsø study. *Pain, 153*(7), 1390-1396.

Jones, R. E. (2011). Total Knee Arthroplasty Without the Use of a Tourniquet. *Seminars in Arthroplasty, 22*(3), 176-178.

Joshi, G. P. & Ogunnaike, B. O. (2005). Consequences of inadequate postoperative pain relief and chronic persistent postoperative pain. *Anesthesiology Clinics of North America, 23*(1), 21-36.

Judge, A., Arden, N. K., Cooper, C., Kassim javaid, M., Carr, A. J., Field, R. E., & Dieppe, P. A. (2012). Predictors of outcomes of total knee replacement surgery. *Rheumatology (United Kingdom), 51*(10), 1804-1813.

Kalkman, C. J., Visser, K., Moen, J., Bonsel, G. J., Grobbee, D. E., & Moons, K. G. M. (2003). Preoperative prediction of severe postoperative pain. *Pain, 105*(3), 415-423.

Kane, R. L., Saleh, K. J., Wilt, T. J., Bershadsky, B., Cross, W. W., MacDonald, R. M., & Rutks, I. (2003). Total knee replacement. *Evidence Report/Technology Assessment (Summary)* (Vol. 86). Rockville, MD: Agency for Healthcare Research and Quality.

Katon, W. J. (2011). Epidemiology and treatment of depression in patients with chronic medical illness. *Dialogues in Clinical Neuroscience, 13*(1), 7-23.

Katz, J. & Seltzer, Z. (2009). Transition from acute to chronic postsurgical pain: Risk factors and protective factors. *Expert Review of Neurotherapeutics, 9*(5), 723-744.

Kehlet, H. & Rathmell, J. (2010). Persistent postsurgical pain: The path forward through better design of clinical studies. *Anesthesiology, 112*(3), 514-515.

Kehlet, H., Jensen, T. S., & Woolf, C. J. (2006). Persistent postsurgical pain: Risk factors and prevention. *The Lancet, 367*(9522), 1618-1625.

Kekecs, Z., & Varga, K. (2013). Positive suggestion techniques in somatic medicine: A review of the empirical studies. *Interventional Medicine & Applied Science, 5*(3), 101-111.

Kekecs, Z., Nagy, T., & Varga, K. (2014). The effectiveness of suggestive techniques in reducing postoperative side effects: A meta-analysis of randomized controlled trials. *Anesthesia & Analgesia, 119*(6), 1407-1419.

Kerns, R. D., Sellinger, J., & Goodin, B. R. (2011). Psychological treatment of chronic pain. *Annual review of clinical psychology, 7*, 411-434.

Kluft, R. P. (2012). Issues in the detection of those suffering adverse effects in hypnosis training workshops. *American Journal of Clinical Hypnosis, 54*(3), 213-232.

Kuttner, L. (2012). Pediatric hypnosis: Pre-, peri-, and post-anesthesia. *Paediatric Anaesthesia, 22*(6), 573-577.

Kwekkeboom, K. L. & Gretarsdottir, E. (2006). Systematic review of relaxation interventions for pain. *Journal of Nursing Scholarship, 38*(3), 269-277.

Labek, G., Thaler, M., Janda, W., Agreiter, M., & Stöckl, B. (2011). Revision rates after total joint replacement: Cumulative results from worldwide joint register datasets. *Journal of Bone & Joint Surgery, British Volume, 93*(3), 293-297.

Lang, E. & Rosen, M. (2002). Cost analysis of adjunct hypnosis with sedation during outpatient interventional radiologic procedures. *Radiology, 222*, 375-382.

Lee, J.K., Zubaidah, J.O., Tan, K.A., Siti Irma Fadhilah, I. (2016). *Pain catastrophizing scale for the Malaysian chronic pain population: Adaptation and validation*. Manuscript in preparation, Department of Psychiatry, Universiti Putra Malaysia, UPM Serdang, Malaysia.

Lewis, G. N., Rice, D. A., McNair, P. J., & Kluger, M. (2015). Predictors of persistent pain after total knee arthroplasty: A systematic review and meta-analysis. *British Journal of Anaesthesia, 114*(4), 551-561.

Linton, S. J., & Bergbom, S. (2011). Understanding the link between depression and pain. *Scandinavian Journal of Pain, 2*(2), 47-54.

Liu, Z. & Yang, H. (2011). Comparison of the minimally invasive and standard medial parapatellar approaches for total knee arthroplasty: Systematic review and meta-analysis. *Journal of International Medical Research, 39*(5), 1607-1617.

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy, 33*(3), 335-343.

Lua, P. L. & Wong, S. Y. (2012). The reliability of the Malay Versions of Hospital Anxiety Depression Scale (HADS) and Mcgill Quality of Life Questionnaire (MQOL) among a group of patients with cancer in Malaysia. *MJP Online Early, 21*(1).

Lynn, S. J. & Green, J.P. (2011). The sociocognitive and dissociation theories of hypnosis: Toward a rapprochement. *International Journal of Clinical & Experimental Hypnosis, 59* (3), 277-293.

Lynn, S. J., Myer, E., & Mackillop, J. (2000). The systematic study of negative post-hypnotic effects: Research hypnosis, clinical hypnosis and stage hypnosis. *Contemporary Hypnosis, 17*(3), 127-131.

Macfarlane, A. J., Arun Prasad, G., Chan, V. W., & Brull, R. (2009). Does regional anesthesia improve outcome after total knee arthroplasty? *Clinical Orthopaedics and Related Research, 467*(9), 2379-2402.

Macintyre, P. E., Schug, S. A., Scott, D. A., Visser, E. J., & Walker, S. M. (2010). *Acute pain management: Scientific evidence*. Melbourne: Australian and New Zealand College of Anaesthetists and Faculty of Pain Medicine.

Macrae, W. A. & Davies, H. T. O. (1999). Chronic postsurgical pain. In: Crombie, I.K., Linton, S., Croft, P., Von Korff, M., LeResche, L., (Eds) (p. 125–42). *Epidemiology of Pain*. Seattle: International Association for the Study of Pain.

Macrae, W. A. (2001). Chronic pain after surgery. *British Journal of Anaesthesia, 87*(1), 88-98.

Macrae, W. A. (2008). Chronic post-surgical pain: 10 years on. *British Journal of Anaesthesia, 101*(1), 77-86.

Madden, K., Middleton, P., Cyna, A. M., Matthewson, M., & Jones, L. (2012). Hypnosis for pain management during labour and childbirth. *Cochrane Database of Systematic Reviews, 11*.

Manzoni, G. M., Pagnini, F., Castelnuovo, G., & Molinari, E. (2008). Relaxation training for anxiety: A ten-years systematic review with meta-analysis. *BMC psychiatry, 8*(1), 41.

March, L. M., Cross, M., Tribe, K. L., Lapsley, H. M., Courtenay, B. G., Cross, M. J., . . . Zicat, B. (2004). Two knees or not two knees? Patient costs and outcomes following bilateral and unilateral total knee joint replacement surgery for OA. *Osteoarthritis and Cartilage / OARS, Osteoarthritis Research Society, 12*(5), 400-408.

Martel, M. O., Wideman, T. H., & Sullivan, M. J. L. (2012). Patients who display protective pain behaviours are viewed as less likable, less dependable, and less likely to return to work. *Pain, 153*(4), 843–849.

Mason, J. B., Fehring, T. K., Estok, R., Banel, D., & Fahrbach, K. (2007). Meta-analysis of alignment outcomes in computer-assisted total knee arthroplasty surgery. *The Journal of Arthroplasty, 22*(8), 1097-1106.

Massarini, M., Rovetto, F., Tagliaferri, C., Leddi, G., Montecorboli, U., Orifiammi, P., . . . Parvoli, G. (2005). Preoperative hypnosis: A controlled study to assess the effects on anxiety and pain in the postoperative period. *European Journal of Clinical Hypnosis, 6*(1), 8-15.

Masselin-Dubois, A., Attal, N., Fletcher, D., Jayr, C., Albi, A., Fermanian, J., . . . Baudic, S. (2013). Are psychological predictors of chronic postsurgical pain dependent on the surgical model? A comparison of total knee arthroplasty and breast surgery for cancer. *Journal of Pain, 14*(8), 854-864.

Mauer, M. H., Burnett, K. F., Ouellette, E. A., Ironson, G. H., & Dandes, H. M. (1999). Medical hypnosis and orthopedic hand surgery: Pain perception, postoperative recovery, and therapeutic comfort. *International Journal of Clinical and Experimental Hypnosis, 47*(2), 144–161.

McCartney, C. J. L. & Choi, S. (2013). IV. Does anaesthetic technique really matter for total knee arthroplasty? *British Journal of Anaesthesia, 111*(3), 331-333.

McDermid, A. J., Rollman, G. B., & McCain, G. A. (1996). Generalized hypervigilance in fibromyalgia: Evidence of perceptual amplification. *Pain, 66*(2), 133-144.

McEwen, H. M. J., Barnett, P. I., Bell, C. J., Farrar, R., Auger, D. D., Stone, M. H., & Fisher, J. (2005). The influence of design, materials and kinematics on the in vitro wear of total knee replacements. *Journal of Biomechanics, 38*(2), 357-365.

McLintock, T.T., Aitken, H., Downie, C.F., & Kenny, G.N. (1990). Postoperative analgesic requirements in patients exposed to positive intraoperative suggestions. *British Medical Journal, 301*(6755), 788-790.

Memtsoudis, S. G., Sun, X., Chiu, Y. L., Stundner, O., Liu, S. S., Banerjee, S., . . . Sharrock, N. E. (2013). Perioperative comparative effectiveness of anesthetic technique in orthopedic patients. *Anesthesiology, 118*(5), 1046-1058.

Meneghini, R. M. & Hanssen, A. D. (2008). Cementless fixation in total knee arthroplasty: Past, present, and future. *The Journal of Knee Surgery, 21*(4), 307-314.

Merskey, H. & Bogduk, N. (1994). Part III: Pain terms, a current list with definitions and notes on usage. In H. Merskey & N. Bogduk (Eds.), *Classification of Chronic Pain, IASP Task Force on Taxonomy* (2nd edition, p. 209-214). Seattle, WA: IASP Press.

Meyer, K., Sprott, H., & Mannion, A. F. (2008). Cross-cultural adaptation, reliability, and validity of the German version of the Pain Catastrophizing Scale. *Journal of Psychosomatic Research, 64*(5), 469-478.

Miller, L. R., & Cano, A. (2009). Comorbid chronic pain and depression: who is at risk? *The Journal of Pain, 10*(6), 619-627.

Milling, L. S. (2008). Recent developments in the study of hypnotic pain reduction: A new golden era of research? *Contemporary Hypnosis, 25*(3-4), 165-177.

Ministry of Health Malaysia. (2014). *Pain Free Hospital manual*. Kuala Lumpur: Ministry of Health Malaysia.

Miró, J., Nieto, R., & Huguet, A. (2008). The Catalan version of the Pain Catastrophizing Scale: a useful instrument to assess catastrophic thinking in whiplash patients. *Journal of Pain, 9*(5), 397-406.

Mondloch, M. V., Cole, D. C., & Frank, J. W. (2001). Does how you do depend on how you think you'll do? A systematic review of the evidence for a relation between patients' recovery expectations and health outcomes. *Canadian Medical Association Journal, 165*(2), 174-179.

Montgomery, C. H., Bovbjerg, D. H., Schnur, J. B., David, D., Goldfarb, A., Weltz, C. R., . . . Silverstein, J. H. (2007). A randomized clinical trial of a brief hypnosis intervention to control side effects in breast surgery patients. *Journal of the National Cancer Institute, 99*(17), 1304-1312.

Montgomery, G. H., David, D., Winkel, G., Silverstein, J. H., & Bovbjerg, D. H. (2002). The effectiveness of adjunctive hypnosis with surgical patients: A meta-analysis. *Anesthesia and Analgesia, 94*(6), 1639-1645.

Montgomery, G. H., Duhamel, K. N., & Redd, W. H. (2000). A meta-analysis of hypnotically induced analgesia: How effective is hypnosis? *International Journal of Clinical and Experimental Hypnosis, 48*(2), 138-153.

Montgomery, G. H., Hallquist, M. N., Schnur, J. B., David, D., Silverstein, J. H., & Bovbjerg, D. H. (2010). Mediators of a brief hypnosis intervention to control

side effects in breast surgery patients: response expectancies and emotional distress. *Journal of Consulting and Clinical Psychology, 78*(1), 80-88.

Montgomery, G. H., Schnur, J. B., & Kravits, K. (2013). Hypnosis for cancer care: Over 200 years young. *CA: A Cancer Journal for Clinicians, 63*(1), 31-44.

Montgomery, G. H., Weltz, C. R., Seltz, M., & Bovbjerg, D. H. (2002). Brief presurgery hypnosis reduces distress and pain in excisional breast biopsy patients. *International Journal of Clinical and Experimental Hypnosis, 50*(1), 17-32.

Morley, S., Williams, A., & Hussain, S. (2008). Estimating the clinical effectiveness of cognitive behavioural therapy in the clinic: Evaluation of a CBT informed pain management programme. *Pain, 137*(3), 670-680.

Morris, L. D., Grimmer-Somers, K. A., Louw, Q. A., & Sullivan, M. J. (2012). Cross-cultural adaptation and validation of the South African Pain Catastrophizing Scale (SA-PCS) among patients with fibromyalgia. *Health and Quality of Life Outcomes, 10*(1), 137-137.

Morze, C. J., Johnson, N. R., Williams, G., Moroney, M., Lamberton, T., & McAuliffe, M. (2013). Knee pain during the first three months after unilateral total knee arthroplasty: A multi-centre prospective cohort study. *The Journal of Arthroplasty, 28*(9), 1565-1570.

Munafò, M. R. & Stevenson, J. (2001). Anxiety and surgical recovery: Reinterpreting the literature. *Journal of psychosomatic research, 51*(4), 589-596.

Na, Y. G., Kang, Y. G., Chang, M. J., Chang, C. B., & Kim, T. K. (2013). Must bilaterality be considered in statistical analyses of total knee arthroplasty? *Clinical Orthopaedics and Related Research, 471*(6), 1970-1981.

Nakama, G. Y., Peccin, M. S., Almeida, G. J., Lira Neto, O. A., Queiroz, A. A., & Navarro, R. D. (2012). Cemented, cementless or hybrid fixation options in total knee arthroplasty for osteoarthritis and other non-traumatic diseases. *Cochrane Database of Systematic Reviews (Online), 10*.

National Healthcare Statistics Initiative. (2011). *National healthcare establishments and workforce statistics (Hospital) 2008-2009*. Kuala Lumpur: Ministry of Health Malaysia.

Néron, S. & Stephenson, R. (2007). Effectiveness of hypnotherapy with cancer patients' trajectory: Emesis, acute pain, and analgesia and anxiolysis in procedures. *International Journal of Clinical and Experimental Hypnosis, 55*(3), 336-354.

Nicholas, M. K., Asghari, A., & Blyth, F. M. (2008). What do the numbers mean? Normative data in chronic pain measures. *Pain, 134*(1), 158–173.

Nicoll D., & Rowley, D. I. (2010). Internal rotational error of the tibial component is a major cause of pain after total knee replacement. *Journal of Bone & Joint Surgery, British Volume, 92*(9), 1238-1244.

Nilsson, U., Rawal, N., Enqvist, B., & Unosson, M. (2003). Analgesia following music and therapeutic suggestions in the PACU in ambulatory surgery: A randomized controlled trial. *Acta Anaesthesiologica Scandinavica, 47*(3), 278–283.

Nilsson, U., Rawal, N., Unestål, L. E., Zetterberg, C., & Unosson, M. (2001). Improved recovery after music and therapeutic suggestions during general anaesthesia: A double-blind randomised controlled trial. *Acta Anaesthesiologica Scandinavica, 45*(7), 812-817.

Niraj, G. & Rowbotham, D. J. (2011). Persistent postoperative pain: Where are we now? *British Journal of Anaesthesia, 107*(1), 25-29.

Noiseux, N. O., Callaghan, J. J., Clark, C. R., Zimmerman, M. B., Sluka, K. A., & Rakel, B. A. (2014). Preoperative predictors of pain following total knee arthroplasty. *The Journal of Arthroplasty, 29*(7), 1383-1387.

O'Dowd-Booth, C. J., White, J., Smitham, P., Khan, W., & Marsh, D. R. (2011). Bone cement: Perioperative issues, orthopaedic applications and future developments. *The Journal of Perioperative Practice, 21*(9), 304-308.

Oh, K. J., Pandher, D. S., Lee, S. H., Sung Joon Jr, S. D., & Lee, S. T. (2009). Meta-analysis comparing outcomes of fixed-bearing and mobile-bearing prostheses in total knee arthroplasty. *Journal of Arthroplasty, 24*(6), 873-884.

Olness, K. (2008). Helping children and adults with hypnosis and biofeedback. *Cleveland Clinic Journal of Medicine, 75*(Suppl.2), 39-43.

Partington, P. (2009). Hypnotic interventions for pain management in chiropractic practice: A review. *Clinical Chiropractic, 12*(3), 109-116.

Patten, S. B. (2001). Long-term medical conditions and major depression in a Canadian population study at waves 1 and 2. *Journal of Affective Disorders, 63*(1), 35-41.

Payne, B., & Norfleet, M. A. (1986). Chronic pain and the family: A review. *Pain, 26*(1), 1–22.

Pérez-Prieto, D., Gil-González, S., Pelfort, X., Leal-Blanquet, J., Puig-Verdié, L., & Hinarejos, P. (2014). Influence of depression on total knee arthroplasty outcomes. *The Journal of Arthroplasty, 29*(1), 44-47.

Persons, J. B., & Fresco, D. M. (2008). Adult depression. *A guide to assessments that work* (pp. 96-120).

Peters, M. L., Sommer, M., Van Kleef, M., & Marcus, M. A. E. (2010). Predictors of physical and emotional recovery 6 and 12 months after surgery. *British Journal of Surgery, 97*(10), 1518-1527.

Phillips, C. J. (2006). Economic burden of chronic pain. *Expert Review of Pharmacoeconomics & Outcomes Research, 6*(5), 591-601.

Pinto, P. R., McIntyre, T., Almeida, A., & Araújo-Soares, V. (2012). The mediating role of pain catastrophizing in the relationship between presurgical anxiety and acute postsurgical pain after hysterectomy. *Pain, 153*(1), 218-226.

Pinto, P. R., McIntyre, T., Ferrero, R., Almeida, A., & Araújo-Soares, V. (2013a). Predictors of acute postsurgical pain and anxiety following primary total hip and knee arthroplasty. *The Journal of Pain, 14*(5), 502-515.

Pinto, P. R., McIntyre, T., Ferrero, R., Almeida, A., & Araújo-Soares, V. (2013b). Risk factors for moderate and severe persistent pain in patients undergoing total knee and hip arthroplasty: A prospective predictive study. *PloS one, 8*(9), e73917.

Ploghaus, A., Becerra, L., Borras, C., & Borsook, D. (2003). Neural circuitry underlying pain modulation: Expectation, hypnosis, placebo. *Trends in Cognitive Sciences, 7*(5), 197-200.

Pogatzki-Zahn, E. M., Schnabel, A., & Zahn, P. K. (2012). Room for improvement: Unmet needs in postoperative pain management. *Expert Review of Neurotherapeutics, 12*(5), 587-600.

Popp, L., & Schneider, S. (2015). Attention placebo control in randomized controlled trials of psychosocial interventions: Theory and practice. *Trials, 16*(1), 150.

Powell, R. S., Pulido, P., Tuason, M. S., Colwell Jr., C. W., & Ezzet, K. A. (2006). Bilateral vs unilateral total knee arthroplasty: A patient-based comparison of pain levels and recovery of ambulatory skills. *The Journal of Arthroplasty, 21*(5), 642-649.

Powell, R., Scott, N. W., Manyande, A., Bruce, J., Vögele, C., Byrne-Davis, L. M., . . . Johnston, M. (2016). Psychological preparation and postoperative outcomes for adults undergoing surgery under general anaesthesia. *The Cochrane Library*.

Quartana, P. J., Campbell, C. M., & Edwards, R. R. (2009). Pain catastrophizing: A critical review. *Expert review of neurotherapeutics, 9*(5), 745-758.

Ramli, M., Rosnani, S., & Aidil Faszrul, A.R. (2012). Psychometric profile of Malaysian version of the Depressive, Anxiety and Stress Scale 42-item (DASS-42). *Malaysian Journal of Psychiatry, 21*(1), MJP Online Early MJP-01-01-12.

Reiss, S., Peterson, R. A., Gursky, M., & McNally, R. J. (1986). Anxiety sensitivity, anxiety frequency, and the prediction of fearfulness. *Behaviour Research and Therapy, 24*(1-8).

Richardson, J., Smith, J. E., McCall, G., & Pilkington, K. (2006). Hypnosis for procedure-related pain and distress in pediatric cancer patients: A systematic review of effectiveness and methodology related to hypnosis interventions. *Journal of Pain and Symptom Management, 31*(1), 70-84.

Riddle, D. L., Keefe, F. J., Nay, W. T., McKee, D., Attarian, D. E., & Jensen, M. P. (2010). Pain coping skills training for patients with elevated pain catastrophizing who are scheduled for knee arthroplasty: A quasi-experimental study. *Archives of Physical Medicine and Rehabilitation, 92*(6).

Ritter, M. A. (2000). Bilateral simultaneous TKR: Doing what's best for the patient. *Orthopedics, 23*(6), 538.

Ritter, M. A., Harty, L. D., Davis, K. E., Meding, J. B., & Berend, M. (2003). Simultaneous bilateral, staged bilateral, and unilateral total knee arthroplasty. A survival analysis. *Journal of bone & Joint Surgery, American Version, 85-A* (8), 1532-1537.

Robinson, M. J., Edwards, S. E., Iyengar, S., Bymaster, F., Clark, M., & Katon, W. (2009). Depression and pain. *Front Biosci, 14*(503), 5031-5051.

Ryan, M. L. & Sheehan, P. W. (1977). Reality testing in hypnosis: Subjective versus objective Effects. *International Journal of Clinical and Experimental Hypnosis, 25*(1), 37-51.

Saadat, H., Drummond-Lewis, J., Maranets, I., Kaplan, D., Saadat, A., Wang, S. M., & Kain, Z. N. (2006). Hypnosis reduces preoperative anxiety in adult patients. *Anesthesia & Analgesia, 102*(6), 1394-1396.

Sawamoto, N., Honda, M., Okada, T., Hanakawa, T., Kanda, M., Fukuyama, H., . . . Shibasaki, H. (2000). Expectation of pain enhances responses to nonpainful somatosensory stimulation in the anterior cingulate cortex and parietal operculum/posterior insula: An event-related functional magnetic resonance imaging study. *Journal of Neuroscience, 20*(19), 7438-7445.

Schnur, J. B., Bovbjerg, D. H., David, D., Tatrow, K., Goldfarb, A. B., Silverstein, J. H., . . . Montgomery, G. H. (2008). Hypnosis decreases presurgical distress in excisional breast biopsy patients. *Anesthesia & Analgesia, 106*(2), 440-444.

Schnur, J. B., Kafer, I., Marcus, C., & Montgomery, G. H. (2008). Hypnosis to manage distress related to medical procedures: A meta-analysis. *Contemporary Hypnosis (John Wiley & Sons, Inc.), 25*(3-4), 114-128.

Schofield, D., Kelly, S., Shrestha, R., Callander, E., Passey, M., & Percival, R. (2012). The impact of back problems on retirement wealth. *Pain, 153*(1), 203–210.

Schoth, D. E., Nunes, V. D., & Liossi, C. (2012). Attentional bias towards pain-related information in chronic pain: A meta-analysis of visual-probe investigations. *Clinical psychology review, 32*(1), 13-25.

Schug, S. A. & Pogatzki-Zahn, E. (2011). Chronic pain after surgery or injury. *Pain Clinical Updates, 14*(1), 1-5.

Sehn, F., Chachamovich, E., Vidor, L. P., Dall-Agnol, L., de Souza, I. C. C., Torres, I. L. S., . . . Caumo, W. (2012). Cross-cultural adaptation and validation of the Brazilian Portuguese version of the pain catastrophizing scale. *Pain Medicine (Malden, Mass.), 13*(11), 1425-1435.

Shan, L., Shan, B., Suzuki, A., Nouh, F., & Saxena, A. (2015). Intermediate and long-term quality of life after total knee replacement. *Journal of Bone and Joint Surgery, American Volume, 97*(2), 156-168.

Shenefelt, P. D. (2003). Biofeedback, cognitive-behavioral methods, and hypnosis in dermatology: Is it all in your mind? *Dermatologic Therapy, 16*(2), 114-122.

Shetty, G. M., Mullaji, A., Bhayde, S., Chandra Vadapalli, R., & Desai, D. (2010). Simultaneous bilateral versus unilateral computer-assisted total knee arthroplasty: A prospective comparison of early postoperative pain and functional recovery. *The Knee, 17*(3), 191-195.

Silbersweig, D. A., Stern, E., Frith, C., Cahill, C., Holmes, A., Grootoonk, S., . . . Frackowiak, R. S. J. (1995). A functional neuroanatomy of hallucinations in schizophrenia. *Nature, 378* (6553), 176-179.

Singh, J. A. & Lewallen, D. G. (2013). Medical and psychological comorbidity predicts poor pain outcomes after total knee arthroplasty. *Rheumatology, 52*(5), 916-923.

Smeets, R. J., Beelen, S., Goossens, M. E., Schouten, E. G., Knottnerus, J. A., & Vlaeyen, J. W. (2008). Treatment expectancy and credibility are associated with the outcome of both physical and cognitive-behavioral treatment in chronic low back pain. *The Clinical Journal of Pain, 24*(4), 305-315.

Smith, H., Jan, M., Mahomed, N. N., Davey, J. R., & Gandhi, R. (2011). Meta-Analysis and Systematic Review of Clinical Outcomes Comparing Mobile Bearing and Fixed Bearing Total Knee Arthroplasty. *Journal of Arthroplasty, 26*(8), 1205-1213.

Smith, T. O. & Hing, C. B. (2010). Is a tourniquet beneficial in total knee replacement surgery? A meta-analysis and systematic review. *The Knee, 17*(2), 141-147.

Smith, T. O., Ejtehadi, F., Nichols, R., Davies, L., Donell, S. T., & Hing, C. B. (2010). Clinical and radiological outcomes of fixed- versus mobile-bearing total knee replacement: A meta-analysis. *Knee Surgery, Sports Traumatology, Arthroscopy, 18*(3), 325-340.

Smith, T. O., King, J. J., & Hing, C. B. (2012). A meta-analysis of randomised controlled trials comparing the clinical and radiological outcomes following minimally invasive to conventional exposure for total knee arthroplasty. *The Knee, 19*(1), 1-7.

Spiegel, D. (2006). Wedding hypnosis to the radiology suite. *Pain, 126*(1-3), 3-4.
Stoelb, B. L., Molton, I. R., Jensen, M. P., & Patterson, D. R. (2009). The efficacy of hypnotic analgesia in adults: A review of the literature. *Contemporary hypnosis, 26*(1), 24-39.
Stubbs, G., Pryke, S. E. R., Tewari, S., Rogers, J., Crowe, B., Bridgfoot, L., & Smith, N. (2005). Safety and cost benefits of bilateral total knee replacement in an acute hospital. *ANZ Journal of Surgery, 75*(9), 739-746.
Stundner, O., Kirksey, M., Chiu, Y. L., Mazumdar, M., Poultsides, L., Gerner, P., & Memtsoudis, S. G. (2013). Demographics and perioperative outcome in patients with depression and anxiety undergoing total joint arthroplasty: A population-based study. *Psychosomatics, 54*(2), 149-157.
Sullivan, M. J. L., Bishop, S. R., & Pivik, J. (1995). The Pain Catastrophizing Scale: Development and validation. *Psychological Assessment, 7*(4), 524-532.
Sullivan, M. J., Thorn, B., Haythornthwaite, J. A., Keefe, F., Martin, M., Bradley, L. A., & Lefebvre, J. C. (2001). Theoretical perspectives on the relation between catastrophizing and pain. *The Clinical Journal of Pain, 17*(1), 52-64.
Swank, M. L., Alkire, M., Conditt, M., & Lonner, J. H. (2009). Technology and cost-effectiveness in knee arthroplasty: Computer navigation and robotics. *American Journal of Orthopedic, 38*(2 Suppl), 32-36.
Tai, T., Lin, C., Jou, I., Chang, C., Lai, K., & Yang, C. (2011). Tourniquet use in total knee arthroplasty: A meta-analysis. *Knee Surgery, Sports Traumatology, Arthroscopy, 19*(7), 1121-1130.
Tefikow, S., Barth, J., Maichrowitz, S., Beelmann, A., Strauss, B., & Rosendahl, J. (2013). Efficacy of hypnosis in adults undergoing surgery or medical procedures: A meta-analysis of randomized controlled trials. *Clinical Psychology Review, 33*(5), 623-636.
Theunissen, M., Peters, M. L., Bruce, J., Gramke, H. F., & Marcus, M. A. (2012). Preoperative anxiety and catastrophizing: a systematic review and meta-analysis of the association with chronic postsurgical pain. *The Clinical Journal of Pain, 28*(9), 819-841.
Thomas, T., Robinson, C., Champion, D., McKell, M., & Pell, M. (1998). Prediction and assessment of the severity of post-operative pain and of satisfaction with management. *Pain, 75*(2), 177-185.
Tomé-Pires, C. & Miró, J. (2012). Hypnosis for the management of chronic and cancer procedure-related pain in children. *International Journal of Clinical and Experimental Hypnosis, 60*(4), 432-457.
Tremblay, I. & Sullivan, M. J. (2010). Attachment and pain outcomes in adolescents: the mediating role of pain catastrophizing and anxiety. *The Journal of Pain, 11*(2), 160-171.
Turk, D. C., Flor, H., & Rudy, T. E. (1987). Pain and families. I. Etiology, maintenance, and psychosocial impact. *Pain, 30*(1), 3–27.
Turner, J. A., Franklin, G., Heagerty, P. J., Wu, R., Egan, K., Fulton-Kehoe, D., Gluck, J. V., et al. (2004). The association between pain and disability. *Pain, 112*(3), 307–314.
Utrillas-Compaired, A., Basilio, J., Tebar-Martínez, A. J., & Asúnsolo-Del Barco, Á. (2014). Does preoperative psychologic distress influence pain, function, and quality of life after TKA? *Clinical Orthopaedics and Related Research®, 472*(8), 2457-2465.

Vacanti, C. A., Sikka, P. K., Urman, R. D., Dershwitz, M., & Segal, B. S. (Eds.). (2011). *Essential Clinical Anesthesia*: Cambridge University Press.

Van Der Voort, P., Pijls, B. G., Nouta, K. A., Valstar, E. R., Jacobs, W. C. H., & Nelissen, R. G. H. H. (2013). A systematic review and meta-regression of mobile-bearing versus fixed-bearing total knee replacement in 41 studies. *Bone and Joint Journal, 95 B*(9), 1209-1216.

VanDenKerkhof, E. G., Peters, M. L., & Bruce, J. (2013). Chronic pain after surgery: Time for standardization? A framework to establish core risk factor and outcome domains for epidemiological studies. *The Clinical Journal of Pain, 29*(1), 2-8.

Vanhaudenhuyse, A., Boly, M., Laureys, S., & Faymonville, M. E. (2009). Neurophysiological correlates of hypnotic analgesia. *Contemporary Hypnosis, 26*(1), 15-23.

Vermetten, E. & Bremner, J. D. (2004). Functional brain imaging and the induction of traumatic recall: A cross-correlational review between neuroimaging and hypnosis. *International Journal of Clinical and Experimental Hypnosis, 52*(3), 280-312.

Vissers, M. M., Bussmann, J. B., Verhaar, J. A., Busschbach, J. J., Bierma-Zeinstra, S. M., & Reijman, M. (2012). Psychological factors affecting the outcome of total hip and knee arthroplasty: A systematic review. *In Seminars in Arthritis and Rheumatism, 41*(4), 576-558.

Wagstaff, G. F. (2000). Can hypnosis cause madness? *Contemporary Hypnosis, 17*(3).

Wagstaff, G. F. (2009). Is there a future for investigative hypnosis? *Journal of Investigative Psychology & Offender Profiling, 6*(1), 43-57.

Wagstaff, G. F., Cole, J., Wheatcroft, J., Anderton, A., & Madden, H. (2008). Reducing and reversing pseudomemories with hypnosis. *Contemporary Hypnosis, 25* (3-4), 178-191.

Wagstaff, G. F., Cole, J., Wheatcroft, J., Marshall, G., & Barsby, I. (2007). A componential approach to hypnotic memory facilitation. *Contemporary Hypnosis, 24*(3), 97-108.

Walker, J. (2012). Care of patients undergoing joint replacement. *Nursing Older People, 24*(1), 14-20.

Wegener, S. T., Castillo, R. C., Haythornthwaite, J., MacKenzie, E. J., & Bosse, M. J. (2011). Psychological distress mediates the effect of pain on function. *Pain, 152*(6), 1349–1357.

Weissman-Fogel, I., Sprecher, E., & Pud, D. (2008). Effects of catastrophizing on pain perception and pain modulation. *Experimental brain research, 186*(1), 79-85.

Wen, Y., Liu, D., Huang, Y., & Li, B. (2011). A meta-analysis of the fixed-bearing and mobile-bearing prostheses in total knee arthroplasty. *Archives of Orthopaedic and Trauma Surgery, 131*(10), 1341-1350.

Whitehead, D. J., & MacDonald, S. J. (2011). TKA sans tourniquet: Let it bleed: Opposes. *Orthopedics (Online), 34*(9), e497-e499.

Williams, A. C. D. C., Eccleston, C., & Morley, S. (2012). Psychological therapies for the management of chronic pain (excluding headache) in adults. *The Cochrane Library*.

Wobst, A. H. K. (2007). Hypnosis and surgery: Past, present, and future. *Anesthesia and Analgesia, 104*(5), 1199-1208.

Wood, B. M., Nicholas, M. K., Blyth, F., Asghari, A., & Gibson, S. (2013). Catastrophizing mediates the relationship between pain intensity and depressed mood in older adults with persistent pain. *The Journal of Pain, 14*(2), 149-157.

Wood, C. & Bioy, A. (2008). Hypnosis and pain in children. *Journal of Pain and Symptom Management, 35*(4), 437-446.

Woody, E. & Szechtman, H. (2000). Hypnhotic hallucinations: Towards a biology of epistemology. *Contemporary Hypnosis, 17*(1).

Worland, R. L., Arredondo, J., Angles, F., Lopez-Jimenez, F., & Jessup, D. E. (1997). Thigh pain following tourniquet application in simultaneous bilateral total knee replacement arthroplasty. *The Journal of Arthroplasty, 12*(8), 848-852.

Yap, J. C., Lau, J., Chen, P. P., Gin, T., Wong, T., Chan, I., . . . Wong, E. (2008). Validation of the Chinese Pain Catastrophizing Scale (HK-PCS) in patients with chronic pain. *Pain Medicine (Malden, Mass.), 9*(2), 186-195.

Yapko, M. (2012). *Trancework: An introduction to the practice of clinical hypnosis* (4th Edition). New York: Routledge.

Zhang, Y., Montoya, L., Ebrahim, S., Busse, J. W., Couban, R., McCabe, R. E., . . . Guyatt, G. H. (2015). Hypnosis/Relaxation therapy for temporomandibular disorders: A systematic review and meta-analysis of randomized controlled trials. *Journal of Oral & Facial Pain and Headache 29*(2), 115-125.

Zigmond, A.S. & Snaith, R.P. (1983). The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica, 67*(6), 361-370.

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