Original Article

Effects of Educational Intervention on State Anxiety and Pain in People Undergoing Spinal Surgery: A Randomized Controlled Trial

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Abstract:

Preoperative educational intervention for anxiety and pain affects patients undergoing spinal surgery. The effects, however, have never been examined using randomized controlled designs. To investigate the effects of education on anxiety and pain for patients undergoing spinal surgery. A randomized trial with block design. Patients were recruited from a medical center in central Taiwan. We invited 90 patients to participate in this study. Inclusion criteria were (a) age ≥20 years, (b) voluntary participation, (c) able to understand Taiwanese Mandarin Chinese or Taiwanese, and (4) no hearing or vision impairments after using aids. Patients (n = 86) undergoing lumbar spinal surgery were randomized into either an Intervention group (using educational intervention; n = 43) or a Control group (n = 43); four patients voluntarily dropped out after surgery (one in Intervention group; three in Control group). Patients had their anxiety (using the State-Trait Anxiety Inventory; STAI) and pain (using a visual analog scale) measured the day before surgery, 30 minutes before surgery, and the day after surgery. After controlling for demographics, the adjusted anxiety and pain levels were significantly lower for the Intervention group: mean STAI scores were 52.67 at baseline and 47.54 at 30 minutes before surgery ($p < .001$); mean pain scores were 6.07 at baseline and 5.28 on day after surgery ($p < .001$). Preoperative educational intervention is effective in informing patients undergoing spinal surgery that can lead to a reduction in pain, anxiety, and fear postoperatively.

INTRODUCTION

People tend to worry about the future because it is unknown (Carleton, Norton, & Asmundson, 2007), especially when it is related to their health. Therefore, patients who will undergo surgery easily become anxious (Ali et al., 2014; Theunissen, Peters, Bruce, Gramke, & Marcus, 2012; Valenzuela Millán, Barrera Serrano, & Ornelas Aguirre, 2010). Moreover, increased anxiety might cause pathophysiological responses such as hypertension (Pan et al., 2015), pain sensitivity (Chieng, Chan, Klainin-Yobas, & He, 2014), additional medication requirements, reduced compliance with procedures (Maranets & Kain, 1999), or refusal to undergo a planned surgery (Julian, 2011; McCleane & Cooper, 1990). Helping patients cope with their anxieties and fears is important. It has been suggested that health care providers minimize the fear for patients on their upcoming procedures by using effective preoperative interventions (Cheung, Callaghan, & Chang, 2003; Gürsoy, Candaş, Güner, & Yılmaz, 2016).

Preoperative interventions primarily use educational techniques with the following components: providing relevant health care information, teaching skills (e.g., deep breathing for relaxation), and psychosocial support (Devine, 1992). In addition, preoperative educational intervention reduces anxiety, reduces pain, improves psychological well-being, and increases patient satisfaction (Cheung et al., 2003; Guo, 2015; Guo, East, & Arthur, 2012; Kekecs, Jakubovits, Varga, & Gombos, 2014). The intervention effects, however, might not be similar across different types of patients: different patients have different concerns and different types of anxiety (Lin, Yang, Lai, Su, & Wang, 2017). Therefore, we wanted to determine the effects of preoperative educational intervention on patients undergoing spinal surgery.

To the best of our knowledge, only a few studies have examined the effects of educational intervention on the anxiety levels of patients undergoing spinal surgery, and none of them used a randomized controlled trial (Chao et al., 2009; Papanastassiou, Anderson, Barber, Conover, & Castellvi, 2011). Patients undergoing spinal surgery, which involves complicated procedures, often have high levels of anxiety (Lee et al., 2016). The source might be the surgery's possible complications—such as paralysis and disability—and wound pain after surgery (Deyo et al., 2010). The wound pain might also inhibit a good recovery, reduce functions for activities of daily living, or both (Tan, Law, & Gan, 2015). Therefore, taking good care of preoperative anxiety and postoperative pain for patients undergoing spinal surgery has recently been emphasized (Chao et al., 2009; Papanastassiou et al., 2011). The promising effects of preoperative education on postoperative anxiety were reported by Chao et al. (2009), and its effects on postoperative pain control were reported by Papanastassiou et al. (2011). However, the Chao study was quasi-experimental and not randomized, and the Papanastassiou study was retrospective. In other words, there was insufficient evidence for health care professionals to clinically implement preoperative education for patients undergoing spinal surgery.

To determine the effects of preoperative educational intervention on the anxiety and pain of patients undergoing spinal surgery, we conducted a randomized controlled trial. Moreover, several physical indicators—including heart rate, respiration rate, and blood pressure—were taken into account as secondary endpoints.

METHODS

This study was approved by the Chung Shan Medical University Hospital Institutional Review Board (IRB number: CS11136) and was conducted from April to December 2012.

Participants

Patients undergoing lumbar spinal surgery were recruited from a medical center in central Taiwan. The inclusion criteria were as follows: (1) age ≥20 years, (2) voluntary participation, (3) understand Taiwanese Mandarin Chinese or Taiwanese (Hoklo; Southern Min), and (4) without any hearing or vision impairments after using aids (e.g., glasses).

The sample size was calculated using G*Power 3.1.5 (Faul, Erdfelder, Lang, & Buchner, 2007) with the following setup: a large effect size (Cohen's $d = .8$) on a two-sided independent t test with an α error of .05 and an allocation ratio of 1 for the two groups. The large effect size was based on the results from Chao et al. (2009), who found that the posttest of anxiety was 4.20 ± 4.31 for the intervention group ($n = 25$) and 7.67 ± 3.35 for the control group ($n = 15$). Moreover, the power was set at .8 and .95 to determine a possibly sufficient range for the sample size. Their results indicated that a minimum of 26 and a maximum of 42 for each group were warranted. Thus, we invited 90 patients because we anticipated that some patients would be lost to follow-up and that some would refuse to participate.

Design and Procedure

This controlled trial used block randomization (Fig. 1). The eligible patients were identified using surgery