

Should the Psychological Regimens Be Introduced into Clinical Pain Control in the Context of Postoperation?

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SUMMARY Patients haunted by pain, acute or chronic, always bear tremendous pressure from spiritual and psychological respects. While the analgesic techniques available currently to certain extent are effective in alleviating pain, which is mainly to acute pathologic condition, it is challenged for its role in many sensitive patients with relatively lower threshold of pain manifesting limited effects treated with analgesic drugs especially when the pain develop into chronicity. Psychological maneuver designed with strategic procedures displayed interesting effect in managing pain. Although different types of psychological interventions have been found producing distinct results in pain relief under various clinical environments, the clinical value of psychological interventions in the postoperative condition is still not clear. Some suggestion and recommendation have been presented by researchers on this topic, but how to optimize these means through balancing the pros and cons of these methods needs to be weighed carefully upon clinical situations. In this review, we discussed the development of psychological pain therapy and raised our concerns about its administration in the clinical environments on the bases of the currently psychological models. ■

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PSYCHOLOGY REFERS to the study on “mind” and “behavior”, so it is strongly mingled with psychiatry and neurology because some common bases exist among them (1). Although great progress has been made in understanding the general psychology, it is not that easy to apply the newly appeared psychological theories into specific condition. Many medical situations are closely associated with psychological states including autism, attention deficit hyperactivity disorder (ADHD), depression, and post traumatic stress disease (PTSD) et al. (2). This makes medical psychological interventions focus on these special medical problems, but does that mean psychological factor exists only in these conditions? The answer is almost ascertained: no. The *de facto* situation is that psychological impact performs function anywhere in the medical practice.

Surgery itself is a strong stress evoker, and many other factors including post-surgical pain, worry about prognosis, complications, future living quality, and financial burden etc. all together stressed up patients to a highly stressful state (3). What is the underlying contributor to this? It is psychology. Pain, as the must-be consequence of different surgical procedures, is unavoidable even though it can be treated. It is still obliged to be treated even though pain itself possesses protective role in keeping patients from further injury. As one of the important parts of sensory system, pain is closely connected with spiritual and psychological feelings, which often results in analgesic failure when traditional pharmacological means are used, and also raises questions on how to alleviate pain through psychotherapeutics (4). Considering the difference in methods of psychological interventions and the association with the changing therapeutic context, the analgesic efficacy of psychosocial support fluctuates.

Potential Mechanisms of Psychological Analgesia

Psychological analgesia is a broad concept that includes all aspects referring to the psychological intervention. Hypnosis, music therapy, preoperative education, and linguistic suggestion all belong to psychological approaches in pain control (5-7). Common neural mechanisms exist no matter what kinds of psychological methods used in analgesia.

Functional magnetic resonance imaging (fMRI) verified an increase in neural activity during placebo associated psychological stimulation that is related to two major pain modulation mechanisms (8): 1) affective regulation which includes activation of the rostral anterior cingulate cortex, bilateral amygdala, and medial prefrontal cortex; and 2) higher cognitive regulation during which the posterior cingulate, pre-cuneus, rostral anterior cingulate cortex, perihippocampal gyrus, and the temporal lobes are activated. As the “gate theory” described that afferent inhibition blocks ascending signals from the periphery, psychological stimuli at the early period produce analgesic effect through a self-reinforcing feedback mechanism.

Several models give an in-depth understanding of the psychological stimulation associated analgesia. Conditioning, expectancy, motivation, and emotion are four psychological mediators involving in the process of analgesia. Conditioning model says that the interventional effect presented when the individual without knowing the stimulation would be and this process would not produce cognition (9). In this model, the perception of pain after psychological treatment largely depends on the learning history of the individual which determines the response variability under different context. The psychological conditioning as well as the verbal suggestion can turn tactile stimuli into pain and low-intensity pain into high-intensity pain. For this, the direct evidence was the conditioned pain reduction could be absolutely removed when the psychological stimuli were explained. Originally, conditioning is the primary response to psychological analgesia.

Following conditioning, expectancy of the psychological stimuli to produce an effective analgesia takes place. Once the patients expect to have an improvement in pain management, the effect of psychological analgesia would play its role. Due to anxiety and fear to pain, patients generally want to have rapid and effective methods that can relieve their pain (10), which consequently leads to an expectancy of their pain therapies. Under this condition, physicians’ attitude and enthusiasm take an important part in whether or not the psychological analgesia comes into play (11). Give patients the hope to conquer pain accompanying with a warmth care, the expected effect of psychological analgesia would be maximized. After expectancy, motivation of analgesia is another aspect in determining the effect of psychological interventions. If the patient desires for a relief of pain, the real analgesic role of psychological stimuli would be magnitude (12). The motivation itself whether or not could predict the psychological effect on one type of pain needs to be explored in detail, and it could be effective for different types of pain is also yet to be guaranteed. A body of literature has confirmed the role of emotions in pain perception and alleviation. Anxiety and stress are two main factors of emotion-associated psychological mediator. It is believed that anxiety is the cause of increased levels of pain, and reduction in anxiety produces analgesia. Stress sometimes is related with increased levels of pain, but in some contexts, stress can produce analgesia (13). Therefore, the purpose of psychological suggestion in pain control is to alleviate patients’ anxiety and stress, which in turn produces a feedback analgesia effect.

Three consecutive stages exist when psychological treatment was given: the induction, psychophysiological mediation, and actualization. In the induction stage, three aspects compose the major contents including the introduction or initiation (therapeutic message; method of administration; follow-up and booster sessions;

assessment of side effects), idiosyncratic variables (beliefs and values; personal history; innate predisposition) and therapeutic context (treatment objectives; therapeutic alliance; sociocultural factors). In the second stage, psychophysiological mediation composes of psychological and biological mechanisms. Psychological mechanisms include above-mentioned conditioning, expectancy, motivation, and emotion, and the biological mechanisms include neurochemical mediators (endorphins, dopamine, and other neurotransmitters/neuromodulators) and neurophysiology (activation of central modulatory mechanisms including descending inhibitory circuits). In the actualization stage, three main aspects exist including subjective experience (pain, emotions, quality of life, satisfaction, and related relief), behavioral markers (amount of analgesics consumed and overt pain behaviors), and physiological markers (physiological nociceptive activity, objective clinical indicators). As thus, when a psychological intervention is given, these three stages would be experienced. However, in consideration of the multiple phases of these stages, the actual effect of psychological analgesia may be variable in different individuals under different circumstances.

Psychological Analgesia: Whether It Is An Effective One in Clinical Practice?

The effect of psychological analgesic approaches largely depends on types of pain, individual status, caregivers' attitude and contextual frame, which finally determines the efficacy of psychological analgesia. For postoperative pain, preoperative hypnosis could accelerate wound healing and alleviate pain intensity after mastectomy, and reduce post-surgical pain and distress in patients undergone excisional breast biopsy (14). However, in other surgical contexts like in military trauma pain control, psychological interventions did not produce detectable difference compared with the control:

relaxation training for spinal surgeries could not reduce postoperative pain (15), and intraoperative music therapy also could not produce analgesia in Cesarean patients; Contrary to this, postoperative music can alleviate the pain and reduce the need for analgesics in patients who undergone Cesarean section (16). Besides, in cardiac surgeries, music therapy produced effective role in alleviating anxiety and pain (17). These different even controversial results raise questions on the real analgesia efficacy of psychological interventions. In fact, difference in interventional methods, types of surgeries, and professionals of investigators may all contribute to the changeable results of psychological analgesia. An attractive study performed to observe the influence of linguistic suggestion on postoperative pain management after abdominal surgeries, and found that negative words from nursing professionals results in therapeutic failure of patient-controlled analgesia, and suggested that a trusting psychological relationship between medical caregivers and patients should be established (7). Therefore, it is necessary to seek a standardized effective psychological method that can be employed at any time to alleviate pain and pain-associated psychological contributors.

Chronic pain, due to its multi-original property and hypo-responsiveness to traditional analgesics, is a complex pathological condition that needs to be cared with specific concentration. How to predict psychological problems in patients with chronic pain and then to take steps to overcome them plays pivotal role in alleviating this kind of pain. Modified Somatic Perception, Zung Questionnaires and Catastrophizing Scale are major means in predicting possible psychological factors in patients with chronic pain. These tools can help to identify psychological problems at early period that is crucial for understanding the development of acute pain into chronic and also possibly preventing its chronicity. Controversial views exist on the effect of psy-

chological factors on the chronicity of pain (see review 18). Various results in different studies questioned the real analgesic effect of psychological approaches in chronic pain management. Also, seek an optimized psychological procedure in chronic pain management is necessary for pain physicians.

Is the Psychological Procedure Useful for Analgesia?

Difference in methods of psychological interventions makes it difficult to reach a uniform procedure that could be used for each individual at different pathological conditions. Irrespective of what kind of methods employed, four basic factors below are consistent and also can be regarded as the interventional focuses: 1) types of pain; 2) individual expectation; 3) medical context; and 4) professional ability.

Pain Category

It is hard to find proper and standard methods to treat pain for all due to its property of multiple originalities plus difference in its duration, intensity and responsiveness to pharmacological analgesics. To have a clear description and avoid an extra complexity of the standardization of the psychological procedure in the types of pain, here two major types of pain, acute and chronic, are discussed. Acute pain is relatively easier to treat and generally resulted from traceable causes. However, chronic pain is refractory to pharmacological treatments and without assured causes. Although acute pain and chronic pain have different transduction pathways, they finally reach brain and then the perception is occur.

Individual Expectation

Individual expectation is the second factor that needs to be standardized. Everyone expects to have an effective method that can conquer the pain because of the unpleasant experience. Once a patient has such a hope, the psychological analgesia would play its role. However the psychological com-

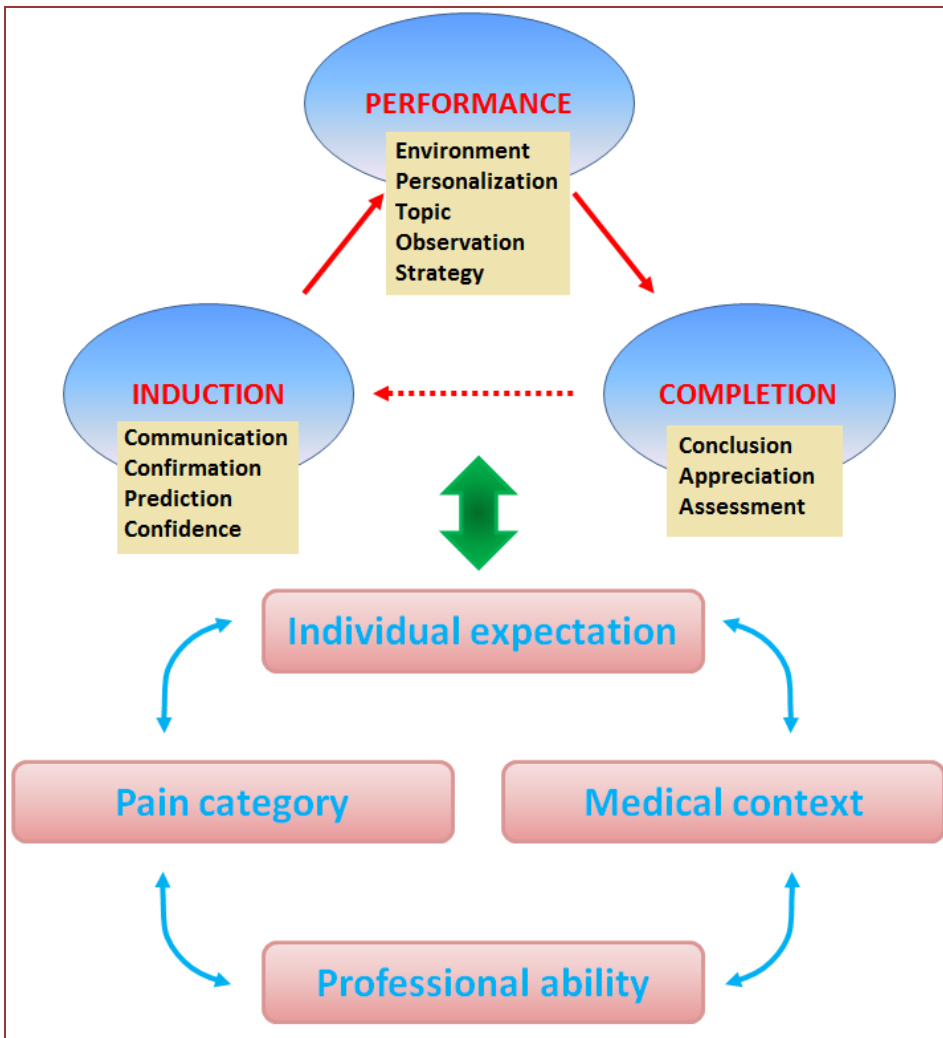


Figure 1. Schematic of Psychological Intervention of Pain.

Even though the currently available psychological regimens are not verified for their effectiveness in alleviating pain, it is still imperative to discuss its potential role in the management of pain by relying on cumulating data of this field. This recommended flowchart of psychological intervention is a derivative of the most current knowledge of psychological analgesia. Different clinical results might get from this regimen, and further verification and in-depth studies are necessary in evaluating its practical value when various presentations presented in individual patient. ■

plexity makes people doubt the real efficacy of the analgesia. Therefore, give a timely psychological intervention along with patients' expectancy is the best way for analgesia through matching their different time windows. Under this condition, careful assessment of patients' psychological status with proper means would give physicians more information on what, how and when a psychological stimulation could be employed. In fact, psychological intervention if given appropri-

ately at this moment exactly fills patients' psychological gap. If want take effective steps to control the pain, time communication with patients is the guarantee. So, the following flow is recommended: talk to confirm the expectancy → predisposition for psychological intervention → psychological preparation → increase confidence of conquering. During this process, the psychological support seems play a more important role than any other factors.

Medical Context

Medical context is the environment where the patients go and seek for pain management. Whether clinics could provide proper and humanistic care or not determines the final conclusion of psychological analgesia. Due to big difference in the contextual background, it is hard to standardize the consulting environment. Here just give a proposal that should at least be followed when administering psychological interventions for pain control: 1) avoiding negative stimuli; 2) establishing a comfortable setting; 3) patient-centered communication; 4) one-stop services. A trusting relationship between medical environment and patients could pave the way to a successful analgesia with psychological approaches.

Professional Ability

Professional ability works like the "software" that needs to be updated and improved gradually with practice. Personal morality is another crucial part that can give patients the taken-to-be-seriously feeling. Further, if the physician trained in psychological treatment, such professional knowledge in psychology would make the psychological analgesia more effective, and would produce the best efficacy in alleviating pain. This section, in fact, is the easiest one that can be improved after training and practice. Following is the suggestion on how to get better results in psychological analgesia: 1) take patients' claim into heart; 2) build friend relationship with patients; 3) serve with the best professional knowledge; 4) psycho-language communication; 5) unchangeable attitude; 6) performance in honesty.

The window of psychological alteration is very wide, which make it easy to be changed when each above-mentioned part cannot satisfy the expectancy. Besides, the prone-to-be-broken psychological state would be shattered by improper intervention. Therefore, patients with different types of pain have various expectancy of analgesia that needs to be treated

with optimal psychological procedures even at different clinics.

Therefore, following three-step procedures should be referred to when performing psychological analgesia:

First, induction:

- (1) Communicate without hint of psychological intervention;
- (2) Confirm patient's psychological state;
- (3) Predict patient's expectancy;
- (4) Increase confidence that is bound to succeed.

Second, performance:

- (1) Select a relatively quiet environment;
- (2) Build a kind talking ambient;
- (3) Give personalized linguistic intervention;
- (4) Choose an interesting topic;
- (5) Talk without constraint;
- (6) Observe psychological change during talking;
- (7) Fine regulation in communication strategies.

Third, completion:

- (1) Conclude what have been talked;
- (2) Thank patient's patience;
- (3) Assess pain intensity with appropriate tools.

Application of psychological linguistic suggestion should not be similar for one person at different visits, and the communicating environment should be changed time after time (Figure 1).

Concluding Remarks

Psychological activity is a complex emotional response that can be influenced by many aspects. Psychological analgesia itself also is a complex process that its efficacy is uncertain for different types of pain under different conditions. Therefore, individualized therapeutic regimen requires selecting personalized interventional methods and performing individualized procedures in patients with various psychological states. While we herein provided some procedures as recommen-

dations for psychological analgesia, it should be bear in mind that the procedures need to be changed for different patients under different medical contexts. ■

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Conflict of Interests

None

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