



Hypnosis for Pain Alleviation: Placebo or Nocebo?

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ABSTRACT

The use of hypnosis to alleviate pain had started to gain recognition. In the assessed papers, application of hypnosis has included childbirth, surgeries, and chronic pain. In childbirth, the use of self-hypnosis can reduce the use of analgesics from 78% to 45% of cases. The satisfaction of hypnobirthing—birth using hypnosis—reaches 96%. Hypnosis can decrease the use of anesthesia drugs during surgery, promotes healing, decreases bleeding and hospital stay. Hypnosis can alleviate pain and reduce the use of over the counter painkillers; also showed benefits for non-cardiac chest pain relief while also reduces medication. Currently, hypnosis had been the most prominent application for labour pain relief. There is a demand for more studies of bioinformatics and neuroscience.

Keywords: Hypnosis, procedural pain

ABSTRAK

Penggunaan hipnosis untuk mengurangi rasa sakit sudah mulai mendapat pengakuan. Banyak pustaka menjelaskan penerapan hipnosis pada proses melahirkan, operasi, dan nyeri kronis. Pada proses melahirkan, *self-hypnosis* dapat mengurangi penggunaan analgesik dari 78% menjadi 45% kasus. Kepuasan *hypnobirthing* – kelahiran menggunakan hipnosis - mencapai 96%. Hipnosis dapat mengurangi penggunaan obat anestesi, mempromosikan penyembuhan, mengurangi perdarahan dan lama rawat di rumah sakit pasca-operasi. Hipnosis bisa mengurangi penggunaan obat penghilang nyeri; juga menunjukkan manfaat untuk penderita nyeri dada non-jantung selain mengurangi konsumsi obat. Saat ini, aplikasi hipnosis yang paling menonjol untuk nyeri persalinan. Diperlukan studi bioinformatika dan *neuroscience* lebih lanjut. **Dias Rima Sutiono, Jeremy Putra Gunawan, Astrella Devina, Wibi Sindjaja, Jesslyn Pavita. Hipnosis untuk Mengatasi Nyeri: Plasebo atau Nosebo?**

Kata kunci: Hipnosis, nyeri prosedural

INTRODUCTION

According to the American Psychological Association, hypnosis is a therapeutic technique in which clinicians make suggestions to individuals who have undergone a procedure designed to relax them and focus their minds.¹ During this state of mind, a subject's critical or skeptical nature can be bypassed allowing for an acceptance of suggestion. A hypnotic state is usually characterized by focused attention, heightened receptivity for suggestions, a bypass of the normal critical nature of the mind, and delivery of acceptable suggestions.²

Hypnosis is used to be seen as occult-exclusive ability, usually used by shaman with magical ability to control minds, communicate with gods and spirits, or take a glimpse to the future. Franz Mesmer, an 18th century physician proposed the first rational basis for hypnosis with his "animal magnetism" or more known as "mesmerism" theory. His method

of transferring 'invisible natural force' from healer to patient through a 'mysterious etheric fluid' remained unconvincing to the rest of scientific audiences and thus once again was not able to clinically prove hypnosis. Only after doctors, physicians, and researchers tried to find the facts behind mesmerism at the end of 19th century, the validity of hypnosis was accepted. By the 20th century, the style of hypnosis changed to what we know now; a permissive style of trance induction based on subtly persuasive language patterns.³

The use of hypnosis is still considered controversial, however, most clinicians now agree that it can be a powerful therapy for a wide range of uses.¹ Hypnosis have gained popularity as an analgesic. Some experts have started some clinical trials on hypnosis intervention for breast cancer. This hypnosis would decrease intraoperative anesthesia and analgesic use and side effects associated with breast cancer surgery and that it would be

cost effective and is undergoing some clinical trials.⁴

HYPNOSIS AND THE BRAIN

Hypnosis induction will affect brain activity, in the form of either increasing or decreasing rCBF (Regional Cerebral Blood Flow) in various locations of brain. An increase of rCBF in both occipital lobes, which is stronger in warm stimulation condition, and also right lateral sulcus and its left insula, are reported. The frontal increase of rCBF extends to the central region through medial frontal and prefrontal areas, which is stronger when given painful stimulation. Increased rCBF is also found in middle, rostral, perigenual, and both hemispheres of anterior cingulate cortex. On the contrary, observation of right inferior parietal lobule, precuneus, and left posterior temporal brain cortices shows rCBF decrease.⁵

Two main mental characteristics are noted in hypnosis: absorption and relaxation.

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Absorption reflects an individual's cognitive capacity for involvement in sensory and imaginative experiences in ways that alter an individual's perception, memory, and mood with behavioral and biological consequences.⁶ Meditation practice focuses on stilling or emptying the mind⁷, which is a state of relaxation. Both states involve increase and decrease of activity in several parts of the brain.⁸

It is currently known that the use of hypnosis involves the anterior attentional system and some frontal lobe functions. Also, the effect to the dopamine system is very clearly implicated. The increase of dopamine leads to a heightened focus and attention¹³. Furthermore, hypnosis seems to not deactivate but instead arouses certain areas of the brain manipulating perception, and altering sensory processing.¹² However, we are still to discover a certain neurophysiological 'signature' of hypnosis.¹²

THE CURRENT POSITION OF HYPNOSIS IN MEDICINE

Hypnosis has started to gain recognition and the American Psychological Association stated that there is definite application of hypnosis in various fields of medicine in 1961.⁶ The National Institute of Health panel also issued a statement by the American Medical Association in 1966 indicating that there was strong evidence for the use of hypnosis in alleviating pain associated with cancer.¹ Several companies or institutes such as Blissborn and Hypnobirthing have already appeared in the public. They provide courses to teach people how to enter a relaxation state making birth easier, calmer and safer without analgesic agents.⁷ There are still hesitations on the efficacy of hypnosis to reduce pain. With increased understanding, all misconceptions of hypnosis will hopefully disappear and more people join the use of hypnosis.

HYPNOSIS AS AN ANALGESIC

In 1997, up to 70% western population uses some form of analgesics regularly for several kinds of pain such as headaches and febrile illnesses.¹³ The percentage of adults above 20 years using opioid analgesic in the past 30 days increased from 5.0% in 1999-2002 to 6.9% in 2003-2006 and remains stable (6.9%) until 2011 to 2012. Also, the use of opioid analgesic stronger than morphine is also on the rise

from 17% in 1999-2002 to 37% in 2011-2012.¹⁸ Opioid dependence and opioid-related deaths is a growing health issue shown with increasing opioid related death more than triples from 1999 to 2012.¹⁴ With such a high use of analgesic agents, the use of hypnosis should be considered seriously. A number of clinical trials and analyses had been done for several different analgesia application including in labor, surgery, and chronic pain.

Child delivery

A review by Patterson & Jensen stated that hypnosis is effective for pain reduction. There are two types of hypnosis: the first involves a hypnotist and a person who is hypnotized and the second involves self-hypnosis (hypnotizing oneself).¹⁵

Hypnosis gives positive results for analgesia in delivery. A British study found that self-hypnosis reduces the use of analgesics from 78% to 45% of childbirth and the need of other intervention such as caesarian, forceps and vacuum.¹⁶ A different study found that the use of hypnobirthing also results in better infant condition, and the mothers would also produce more milk with higher nutrients so that only 7% would need a supplementation by formula milk. Generally, the majority (96%) of mothers who have undergone hypnobirthing said that they would use it again in the future.¹⁷

Landolt covers the negative side of pain control methods used in child delivery. Popular anesthesia used is epidural anesthesia and low spinal anesthesia called saddle block. Both cause motor blockade, interfere with a woman's ability to push forcefully resulting in longer labor, an increased risk of hypotension and instrumental delivery. Narcotic analgesics such as meperidine and morphine sulfate may cause neurobehavioral depression in the

infant (e.g., poor sucking response, depressed respiration, decreased alertness and attention, poor muscle tone) that can last for several days. By using hypnosis in childbirth, the side effects of conventional analgesic drugs could be minimized.²³

Surgery

A paper by Kendrick, C. reviews on the impact of hypnosis before surgery. The author speculates that hypnosis has limited pain reducing power that it could give a positive result for minor surgery, inconsistent for burn pain, and insignificant for major surgery.¹⁸ In most studies, hypnosis is a powerful non-pharmacologic analgesic tool both relaxation and distraction for oral surgery. The basal pain threshold was respectively with a significant difference between the two ($p < 0.001$) in the RFP (Right first premolars) and the LFP (Left first premolars), showing the effectiveness of HFA (hypnotic focused analgesia).²⁴

Chronic pain

A placebo controlled study of 28 non-cardiac chest pain cases shows that hypnosis benefit in pain relief and also decrease medication (patients in both groups were taking beta blockers, calcium channel blockers, potassium channel activators, nitrates, aspirin, and statins) with the exception of statins.²⁰

A single-center randomized controlled trial used a two-arm parallel group design comparing hypnosis and massage as control. Fifty-three patients were included (mean age: 80.6 ± 8.2), 14 men were having chronic pain for more than 3 months with impact on daily life activities, intensity of >4 on a numerical pain rating scale (0-10) at inclusion despite adequate analgesia; no cognitive impairment. Brief pain inventory was conducted; 26 gets hypnosis; 27 gets massage. Pain intensity decreased significantly in both groups after

Table. rCBF changes in brain pertaining mental states in hypnotic condition¹²

Mental states	Location of activities	
	Increase of rCBF	Decrease of rCBF
Absorption	Thalamus Rostral and perigenual ACC Frontal lobe Precentral region Right hemispheres of inferior parietal lobules	Left hemispheres of inferior parietal lobules Right precuneus Posterior cingulate cortex Both occipital lobes
Relaxation	Middle and perigenual ACC Precentral region Right precuneus Left inferior parietal lobule Bilateral occipital cortices	Mesencephalic tegmentum of the brain stem Right parietal operculum and lobule



each session. Average pain measured by the brief pain index is significantly lower in the hypnosis group during hospitalization. The intensity of the pain before each session decreased only in the hypnosis group ($P=0.008$). Depression scores improved significantly only in the hypnosis group ($P=0.049$). No long term effect found in treatment group.²¹

The evidences from various studies, review, and meta-analysis show that: In hypnosis, there are differences in brain activity according to difference of rCBF rate in different areas of the brain. The hypnosis causes different brain hormone regulation, the activity of serotonin is prolonged with its decreased reuptake and the dopamine is increased.²⁵

Hypnosis in child delivery is quite effective in lowering the use of analgesics and birth intervention. During surgery, hypnosis reduces pain reception in brain; in minor surgery, hypnosis could reduce the requirement of pain reducing anesthesia and also reduce postsurgical pain medication.²⁶ However, hypnosis could not reduce the anesthesia required for major surgery. For chronic pain, there is a significant decrease of pain level and pain medication intake. However, no long term effect is observed, meaning the hypnosis should be administered daily.⁴ The effect of hypnosis is quite big that economically, even one session of hypnosis could save over \$300

during hospitalization.¹⁹

The power of hypnoanalgesia could differ²⁸. Person with either high, medium, or low susceptibility to hypnosis elicit different reaction to hypnosis ($p<0.05$). The results demonstrate that hypnotic is an effective analgesics based on analyses of 27 effect sizes and more than 900 participants, indicating that the average participant treated with hypnosis demonstrated greater analgesic response than 75% of participants in standard and no-treatment control groups. The magnitude of the hypnoanalgesic effect did not differ for clinical and healthy volunteer samples, however, hypnoanalgesic effects seem to differ according to levels of hypnotic suggestibility, especially when people highest in suggestibility are compared to those lowest in suggestibility²⁸

THE FUTURE OF HYPNOSIS

Susceptibility and standardized method is not yet available, as it is important for the research to be reproduced. Susceptibility of the patient is very important and sample population may not be representative for the world population. The true mechanism of hypnosis has not been fully understood yet as well. Therefore, the approach of bioinformatics and neuroscience should be considered. We need to update the scales of hypnotic susceptibility by the use of novel factor analytic studies with psychological scales.

The new generation of hypnosis study could use microarray technologies for the measurement of gene expressions and proteins during a hypnotic state. The use of brain imaging technologies has started to be used and its use is expected to increase. Brain imaging technologies such as fMRI and PET should be used to assess the effectivity of hypnosis. The updated and modern technology upgrade can also fit into the previously made Weitzenhoffer's ideodynamic Action Hypothesis of Hypnosis; the ideodynamic action leads to activity-dependent gene expression or protein synthesis. This gene expression or protein synthesis leads to brain plasticity reconstructing several different psychological outcomes.²²

CONCLUSION

The use of hypnosis had started to gain recognition and is no longer considered as mystical. The use of hypnosis for childbirth or commonly called hypnobirthing is the most prominent application of hypnosis. More studies have to be conducted and should evolve into analytical studies with psychological scales by the use of gene and social behavior.²⁹ The increasing discoveries in hypnosis let us to believe that it does not deactivate but instead arouses the part of the brain. Further study will be needed to discover the true potency of hypnosis as pain reliever.

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