

# The effects of hypnotherapy during transrectal ultrasound-guided prostate needle biopsy for pain and anxiety

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## Abstract

**Introduction** Several studies evaluating the tolerance of transrectal ultrasound (TRUS)-guided needle biopsies showed that moderate-to-severe pain was associated with the procedure. Additionally, prebiopsy anxiety or rebiopsy as a result of a prior biopsy procedure is mentioned as factors predisposing to higher pain intensity. Thus, in this study, we investigated the effects of hypnotherapy during transrectal ultrasound-guided prostate needle biopsy for pain and anxiety.

**Materials and methods** Sixty-four patients presenting for TRUS-guided prostate needle biopsy were randomly assigned

to receive either 10-min presurgery hypnosis session ( $n = 32$ , mean age  $63.5 \pm 6.1$ ,  $p = 0.289$ ) or a presurgery control session ( $n = 32$ , mean age  $61.8 \pm 6.8$ ,  $p = 0.289$ ). The hypnosis session involved suggestions for increased relaxation and decreased anxiety. Presurgery pain and anxiety were measured using visual analog scales (VAS), Beck Anxiety Inventory (BAI), and Hamilton Anxiety Scale (HAS), respectively. In our statistics,  $p < 0.05$  was considered statistically significant.

**Results** Postintervention, and before surgery, patients in the hypnosis group had significantly lower mean values for presurgery VAS [mean 1 (0–8);  $p = 0.011$ ], BAI (6.0 vs 2.0;  $p < 0.001$ ), and HAS (11.0 vs 6.0;  $p < 0.001$ ).

**Conclusion** The study results indicate that a brief presurgery hypnosis intervention can be an effective means of controlling presurgical anxiety, and therefore pain, in patients awaiting diagnostic prostate cancer surgery.

**Keywords** Prostate needle biopsy · Pain · Anxiety · Hypnotherapy

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## Introduction

Hypnosis has been shown to be an effective means of reducing preprocedure distress in a variety of surgical settings, including gynecologic surgery and excisional breast biopsy [1, 2]. Patients presenting for transrectal ultrasound (TRUS)-guided needle biopsy typically have substantial levels of presurgical emotional distress, which has been shown to predict pain [3–5]. Although modern drug regimens are effective in eliminating pain and improving tolerability of minor surgical procedures, surgery continues to be associated with clinically significant side effects, including postsurgical pain, nausea, and fatigue [6, 7]. Non-pharmacotherapeutic manipulations of physiologic processes have

achieved success in decreasing pain and anxiety in many contexts [8, 9]. Hypnosis, a brief cognitive–behavioral technique with no specific side effects, is one such technique [10]. Hypnosis typically involves an introduction to the procedure during which the subject is told that suggestions for imaginative experiences will be presented. The hypnotic induction is an extended initial suggestion for using one's imagination and may contain further elaborations of the introduction. A hypnotic procedure is used to encourage and evaluate responses to suggestions. When using hypnosis, one person (the subject) is guided by another (the hypnotist) to respond to suggestions for changes in subjective experience and alterations in perception, sensation, emotion, thought, or behavior. Persons can also learn self hypnosis, which is the act of administering hypnotic procedures on one's own [10, 11]. Clinical research with different surgical populations has indicated that hypnosis can reduce the need for medication, reduce postsurgical symptoms, or enhance recovery (e.g., by reducing pain, nausea, and length of hospital stay) [9, 10]. In the literature, there is no controlled, randomized clinical trial to determine the effectiveness of hypnosis in transrectal ultrasound-guided prostate needle biopsy patients. Thus, we designed a randomized clinical trial of a brief presurgery hypnosis intervention compared with a control group in patients with the suspicion of prostate cancer. The aim of the present study was to determine whether a brief, presurgery, hypnosis intervention would be effective in reducing patients' presurgical anxiety in a sample of men scheduled for diagnostic prostate cancer surgery (TRUS-guided prostate needle biopsy) relative to control group. The hypothesis was that presurgical anxiety and therefore pain would be significantly lower in the hypnosis group than in the control group.

## Method

### Participants

This prospective study was approved by the ethics committee in February 2014. All the patients gave us a signed, written informed consent form prior to performing TRUS-guided needle biopsy. During the 6-month period from March 1, 2014 to August 31, 2014, 64 patients who satisfied the following criteria were enrolled in this study: (1) patients with increased levels of prostate-specific antigen (PSA) with or without an abnormal digital rectal examination; (2) patients with lesion suspected to be malignancy on TRUS with or without an abnormal digital rectal examination; (3) patients without a history of previous TRUS-guided prostate biopsy; (4) patients older than 40 year; (5) patients willing to be randomized to a study intervention group. Exclusion criteria were uncontrolled mental illness

and psychotropic medication use. The interventionist performed the prostate biopsies. All imaging was performed using a 5500BW ultrasound scanner (Sono Scape SSI).

### Measures

For this study, the patients were invited for a single interview in which the sociodemographic data and the clinical history of the patients were recorded before surgery. The patients were given the following measures: (1) the Beck Anxiety Inventory and (2) the Hamilton Anxiety Scale (HAS).

#### *Beck Anxiety Inventory*

It is a self-assessment tool used to determine frequency of anxiety symptoms experienced by an individual, which was developed by Beck et al. in 1988. It includes 21 items, which are rated by a three-point Likert-type scale. Turkish reliability and validity studies were performed by Ulusoy et al. in 1998. In this tool, 8–15 points is considered as mild anxiety, while 16–25 points and 26–63 points are considered as moderate and severe anxiety, respectively [12].

#### *Hamilton Anxiety Scale*

The HAM-A is a 13-item scale administered by an interviewer that measures the severity of general anxiety. Symptom severity is rated between 0 and 4. The original test was developed by Hamilton. The Turkish version of HAM-D has been shown to be a reliable and valid instrument by Yazıcı et al. in 1998 [13].

#### *Visual analog scale items*

One of the pain-relieving techniques do not act on patients were evaluated by a single investigator responsible for measuring the primary pain outcome by use of a visual analog scale (VAS) [14]. The VAS was used to evaluate the pain generated by the transducer introduction and the pain generated by biopsy. Pain was classified as follows: absence of pain, score of 0; mild pain, score of 0.1–3; moderate pain, score of 3.1–7; and severe pain, score from 7.1–10. VAS scores have been shown to provide a reliable and valid measure of mood in a wide variety of patient populations including breast cancer and are ideally suited to busy surgical settings where time is of the essence [9, 14, 15].

### Procedures

Patients who were scheduled for TRUS-guided prostate needle biopsy were referred by their surgeon. Then, their surgeon described the study and obtained written informed

consent. Consenting participants completed the sociodemographic data before surgery. All patients were given oral antibiotics as a prophylactic, and they were not given painkillers. Participants were randomly assigned to either a hypnosis group or a control group. The hypnosis intervention sessions were standardized to last 10 min. The hypnosis intervention included (1) debunking common misconceptions about hypnosis; (2) giving the patient an opportunity to ask questions about hypnosis; (3) presenting a scripted hypnotic induction involving a relaxation-based induction, guided imagery, deepening, and specific surgery-related suggestions for decreased pain and anxiety; and (4) providing instructions for how participants could reenter hypnosis on their own, at will. Patients in the control group were allowed by the interventionist to guide the conversation, and the interventionist provided empathic listening, supportive/empathic remarks. Both the hypnosis intervention and control sessions were asked by their surgeon to complete the entire measures before the intervention to assess differences in baseline anxiety levels. Before surgery, participants were also asked to complete the VAS items immediately after the 10-min intervention. After surgery, both hypnosis intervention and control groups were given the measures again.

### Statistical analysis

All statistical evaluations were done by SPSS 15.0 package program. Mann–Whitney test was used to show the relation of pain with parameters. We used the Wilcoxon test and student *t* test for parameter's analysis. Student *t* tests were performed for making comparison of age, PSA levels and the pain scores between two groups. In our statistics,  $p < 0.05$  was considered statistically significant.

### Results

Table 1 contains information on age, BMI, prostate weight, PSA variables, and mean values for presurgery VAS of each group ( $p > 0.05$ ). There were no significant between-group differences on age ( $p = 0.289$ ), BMI ( $p = 0.676$ ), prostate weight ( $p = 0.143$ ), and PSA ( $p = 0.773$ ) variables. There were no significant differences on BAI and HAS total score in the control group after treatment ( $p > 0.05$ ). Analyses of variance revealed a significant intervention effect such that hypnosis group participants experienced significantly less presurgical anxiety after the intervention than control group patients. Postintervention, and before surgery, patients in the hypnosis group had significantly lower mean values for presurgery VAS [mean 1 (0–8);  $p = 0.011$ ], BAI (6.0 vs 2.0;  $p < 0.001$ ) and HAS (11.0 vs 6.0;  $p < 0.001$ ). Changes in BAI and HAS scores hypnotherapy compared

**Table 1** Pretreatment comparisons of treatment groups

	Hypnotherapy <i>n</i> = 32	Control <i>n</i> = 32	<i>p</i>
Age	63.5 ± 6.1	61.8 ± 6.8	0.289
BMI	26.8 ± 2.8	26.5 ± 3.3	0.676
Prostate weight	45 (16–100)	37.5 (23–104)	0.143
PSA	7.2 (2.5–30.2)	7.5 (3.5–101)	0.773
VAS	1 (0–8)	3 (0–9)	0.011

*p* values < 0.05 were considered statistically significant

BMI Beck Anxiety Inventory, PSA prostate-specific antigen, VAS visual analog scale

to the control group were found to be significantly higher ( $p < 0.001$  and  $p < 0.001$ , respectively) (Table 2).

### Discussion

Transrectal ultrasound-guided prostate biopsy is an essential diagnostic modality for making the preoperative diagnosis of patients with a suspected malignancy [16]. Unfortunately, patients generally experience significant pain during the procedure. Because of the patient's fear of a potential diagnosis of cancer, fear of using the anal route, and the examined organ being part of the male sexual system, the pain was experienced during TRUS-guided prostate biopsy [17, 18]. The effectiveness of hypnosis for controlling side effects of other types of surgery (e.g., breast reduction, gynecologic surgery, coronary artery bypass) has been established in the broader literature; however, this study is, to our knowledge, the first trial with prostate cancer surgical patients that was sufficiently powered to demonstrate these beneficial effects [9, 19–21].

For an increasing number of biopsies, investigators are now showing an increased interest in the risk factors for experiencing pain during TRUS-guided prostate biopsy. However, few of the risk factors for pain have been established. A younger age, anxiety, the number of cores taken, and repeat biopsy appear to be the risk factors for a painful biopsy [19, 22, 23].

The present study demonstrated that patients who received a brief (10-min) hypnosis session before TRUS-guided prostate needle biopsy experienced lower levels of presurgical anxiety than patients who were in the control condition. More specifically, patients who received hypnosis before their surgery were significantly less anxious and were significantly more relaxed before surgery (posthypnosis) than patients who were in the control condition. The present study demonstrates that a brief behavioral procedure can bring substantial relief to prostate biopsy patients at a particularly stressful time, similar to that seen with

**Table 2** Groups according to the distribution of different anxiety scale scores

	Hypnotherapy <i>n</i> = 32			Control <i>n</i> = 32				
	Before	After	<i>p</i> *	Before	After	<i>p</i> *	<i>p</i> †	<i>p</i> ‡
BAI	6 (0–28)	2 (0–23)	<0.001	9 (0–28)	8 (0–34)	0.158	0.001	<0.001
HAS	11 (2–29)	6 (0–22)	<0.001	11.5 (0–31)	11.5 (1–38)	0.155	0.005	<0.001

BAI Beck Anxiety Inventory, HAS Hamilton Anxiety Scale

\* Comparing the results before and after intra-group transactions

† Comparing the results between groups after the procedure

‡ Between groups, intra-group comparison of time-dependent change

pharmacologic (e.g., benzodiazepines) and non-pharmacologic techniques (e.g., acupuncture) used to manage presurgical distress [24–26].

The results of the present study suggest that the hypnosis intervention is helpful for the vast majority of prostate biopsy patients. Patients' previous experience with hypnosis should similarly be explored as a moderator of intervention effects in future research. The present study also has implications for research on the contribution of psychological distress to patients' experiences of postsurgery side effects.

There are several limitations in our study. First, although the study design was prospective, the way or attitude in which the investigator handled the questionnaire with interviewing patients may have induced some bias because the investigator knew the patients' prostate volume. So, a double-blinded randomized study could show more objective results. A second limitation of this study is that a formal assessment of the effectiveness of blinding of research or clinical staff was not conducted. Thirdly, as this was a randomized trial, between-group differences on either variable (hypnotic susceptibility, hypnosis experience) are unlikely, and therefore, neither variable is likely to account for the present results.

Additionally, a few studies have accessed the relationship between prostate volume and biopsy pain. According to recent reports, higher prostate volumes do not necessarily increase the pain associated with the procedure [22, 23]. However, one of the recently study findings have indicated that the patients with larger prostate volumes were found to experience higher degrees of pain during and after TRUS-guided prostate biopsy. According to his findings, the researchers suggest that additional analgesic strategies may be necessary for performing TRUS-guided prostate biopsies of larger prostates. In the present study, there was no significant relation between prostate volume and biopsy pain.

## Conclusion

In conclusion, the results of the present study reveal that a brief hypnosis session prior to surgery is effective in decreasing presurgical anxiety prior to TRUS-guided prostate needle biopsy.

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## Compliance with ethical standards

**Conflict of interest** No conflict of interest was declared by the authors.

**Ethics committee approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

**Informed consent** Written informed consent was obtained from patients who participated in this study.

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