

Original Article

The Effect of Therapeutic Touch on Pain and Fatigue of Cancer Patients Undergoing Chemotherapy

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Despite major advances in pain management, cancer pain is managed poorly in 80% of the patients with cancer. Due to deleterious side effects of pharmacology therapy in these people, there is an urgent need for clinical trials of non-pharmacological interventions. To examine the effect of therapeutic touch (TT) on the pain and fatigue of the cancer patients undergoing chemotherapy, a randomized and three-groups experimental study—experimental (TT), placebo (placebo TT), and control (usual care)—was carried out. Ninety patients undergoing chemotherapy, exhibiting pain and fatigue of cancer, were randomized into one of the three groups in the Cancer Center of Imam Khomeini Hospital in Tehran, Iran. Pain and fatigue were measured and recorded by participants before and after the intervention for 5 days (once a day). The intervention consisted of 30 min TT given once a day for 5 days between 10:00 a.m. and 10:30 a.m. The Visual Analogue Scale (VAS) of pain and the Rhoten Fatigue Scale (RFS) were completed for 5 days before and after the intervention by the subjects. The TT (significant) was more effective in decreasing pain and fatigue of the cancer patients undergoing chemotherapy than the usual care group, while the placebo group indicated a decreasing trend in pain and fatigue scores compared with the usual care group.

Keywords: cancer patients—chemotherapy—pain and fatigue—therapeutic touch

Introduction

over the last several years, hospitals have developed comfort and pain management programs that support minimizing pain and maximizing comfort for their patients (1). Despite the major advances in pain management, cancer pain is managed poorly in 80% of the patients with cancer (2). Early studies on under treatment cancer pain were focused on identification of the patients (3), providers (4) and system barriers (5) to optimize cancer pain management. There are two methods for pain relieving in cancer patients: pharmacological and non-pharmacological methods. Cancer patients have

misconceptions about tolerance, physical dependence and psychological addiction (3). The outpatients with cancer, with and without cancer pain, achieved an average score of only 60% on the Pain Experience Scale. In addition, another study results indicated that the patients are given too much pain medicine (6).

Fatigue is the most frequently reported symptom of cancer patients (7). Moreover, it is often reported that this symptom is the most distressing parameter that causes the greatest amount of interference with the patient's daily life (8). This symptom is also very common among the patients with advanced diseases who are receiving palliative treatment (9). In addition, many cancer survivors report continued fatigue that adversely impacts their quality of life (10). Most patients with severe cancer pain may develop others associated symptoms, commonly induced by opioids *per se*. Intensity of the pain has been found to be associated with a low

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level of function and higher intensity of symptoms. Pain control may indirectly improve some symptoms and other measures such as nausea and vomiting, well-being, mood and appetite. Fatigue and loss of appetite are correlated with pain intensity (11).

Therefore, to control pain and to decrease fatigue in the patients undergoing chemotherapy, it is essential to rigorously examine non-pharmacological interventions that are less likely to result in deleterious side effects that can elicit a relaxation response and can maintain quality of life. One such non-pharmacological intervention is therapeutic touch (TT).

Therapeutic Touch

TT was first described by Dora Kunz and researched by Dolores Krieger, co-founder of TT in 1973. TT is based on the assumption that the physical body is surrounded by an aura (energy not visible to normal vision) and is penetrated and kept alive by a universal energy called *prana* (a Sanskrit word meaning *vital force*) that flows through the body and is transformed by *chakras* or non-physical vortices. Energy imbalance supposedly results in illness, which can be intuitively assessed in a form of psychic diagnosis, and then treated hands-on (12). This view can be supported by the nursing theory of Martha Rogers (1970, 1990) based entirely on a field world view.

Rogers (1983) postulates that the human and environmental fields are identified by wave patterns, and that change is propagated by waves. Nursing interventions such as TT are directed towards promoting the rhythmic flow of energy waves that order and re-order the human field. Symptoms are viewed as energy blockages, congestion, dysrhythmias, or areas of imbalance in the field. As dysrhythmias are corrected by TT, the whole field becomes balanced. According to Rogers (1970, 1990), human being is a complex energy field. Our present technology does not allow the measurement of the human energy field, but to a trained sense, primarily touch, the human energy field can be perceived and assessed. One is able to develop this sensitivity through a process called 'centering', the attainment of a mental state in which the practitioner quiets the mind, detaches from inward and outward distractions, and focuses full attention and intention on helping the patient (13).

Krieger (14) reviewed the most reliable clinical effects of TT and concluded that: 'Ranking highest in reliability... is the very rapid relaxation response in the healee'. This can be observed 2–4 min after the start of TT interaction. According to Krieger (14), the second most reliable clinical effect of TT is 'the amelioration or eradication of pain' (14).

Unlike Krieger, Meehan (15) has reported that TT is not statistically significant in pain reduction, and

similarly concluded TT does not significantly decrease postoperative pain during the first hour following the intervention (15).

Winstead-Fry and Kijek (16) have reviewed 13 out of the 18 published experimental studies on TT (Krieger/Kunz method), revealing inconsistent results for several reasons: small sample sizes; reliance on a single anxiety measure (State-Trait Anxiety Inventory); the use of healthy instead of ill participants; lack of consistent operational definitions; short treatment time (< 5 min), and single treatments with no follow-up measures over the time (16). Few of these researches have been tested using a placebo-controlled experimental design (Class I evidence). A more complete summary has been published by Doody *et al.* (17).

The present research attempted to study the effect of TT on pain and fatigue in the cancer patients undergoing chemotherapy by adequate sample size and placebo group. Our hypothesis was that TT would decrease the intensity of pain and fatigue in the patients under chemotherapy.

Methods

Ninety randomly assigned participants were allocated to one of the three groups (experimental, placebo and control) using a randomized clinical trial (RCT), and a three-group experimental pre-test/post-test design. The experimental group received TT, the placebo group received a mimic treatment that resembled TT to the naive observer, and the control group received routine care. The dependent variables were pain and fatigue, measured by the patients undergoing chemotherapy. TT intervention administered once daily for 5 days. During the study, pain and fatigue were recorded before and after the interventions daily for 5 days by self-report.

Sample and Setting

A convenience sample of cancer persons under chemotherapy and suffering from pain and fatigue, were selected from three special care units (with 14, 16 and 18 beds) when the patients were hospitalized for receiving the chemotherapy drugs. The patients themselves determined and recorded the intensity of pain and fatigue within 5 days.

Criteria for participation in this study included the residents who: (1) had a diagnosis of cancer; (2) had a normal level of consciousness (Glassco Coma Scale, GCS = 15); (3) aged 15–65 years, and (4) had resided in the unit for at least 5 days. The excluded residents were those who had any diseases leading to experience of pain (such as arthritis rheumatoid and osteo-sarcoma). Since the practitioner was female, therefore, to observe the cultural believes of the Moslems, all the subjects

were selected from among the females. The sample size was determined as 90 participants (30 persons for each group) according to the Nomogram's Altman (18) (clinical difference = 2, standard error = 3 and power $(1 - B) = 0.90$). After obtaining consent, all the participants were enrolled into the study. The participants were randomly allocated in three study groups. The study field was a referral center to which the cancer patients were referred for treatment. Forty cancer patients were confined to bed and intake of chemotherapy drugs; therefore, they were discharged after 5 days. Before the intervention, 90 cards numbered (1–90) were provided and three pockets were randomly selected for the study groups (A = control, B = placebo and C = experimental). The numbered cards were selected randomly and allocated in three pockets, respectively. At the time when the patients referred to the center, they were taken a number, respectively and, then, allocated in their groups according to the numbers in the pockets. The processes of selection and intervention were continued for 3 months.

Measures

The Visual Analogue Scale (VAS) of pain and the Rhoten Fatigue Scale (RFS) were used to measure pain and fatigue of the patients.

VAS

The VAS is a 10 cm line labeled 'no pain' at one end and 'the pain is as much as I can bear' at the other. Here, the patients were given an explanation of the line and asked to mark a point upon it which corresponded to their pain.

RFS

This scale developed by Rhoten in 1979, has 11-point self-rating graphic VAS with verbal anchors on each end. 'No fatigue' at one end and 'the fatigue is as much as I can bear' at the other. The clinical utility of the scale is very easy to use.

Procedure

Following the approval by the Ethical Committee at the Cancer Research Center of Imam Khomeini Hospital (Tehran, Iran) and explanation of the study to the participants, consent and demographic data were obtained. The researcher was introduced to the patients. The researcher who performed TT had received about 5 months of training by the specialist of TT. Pre-intervention data collection was conducted over a 5-day period before each intervention, to gather baseline data using VAS questionnaire of pain and fatigue, filled by the subjects (self-report) every day before (pre-test) and after (post-test) the intervention.

TT in the Experimental Group

TT was delivered for 5 days (once a day at the same time each day: between 10:00 a.m. and 10:30 a.m.). The intervention was conducted in the privacy of the participant's room. The participants were guided or gently led to their room prior to the beginning of the intervention. They were laid on their backs on their hospital beds for the treatment. Prior to the first treatment, they were instructed to relax as fully as possible and a brief explanation of TT procedures was given. The intervention consisted of *centering*, *assessment*, *TT administration* (directing human energies, modulating human energies, changing patterns in human energy field), *reassessment* of the patient's energy field and additional treatments as needed.

The intervention lasted for 30 min. Since, there was no previous research on which to base the length of intervention, the length of intervention was determined after expert consultation with the specialist of TT and the clinical expertise with cancer patients and considering the participant's psychological and physical status and restlessness.

Placebo Intervention

The placebo intervention consisted of mimic TT. Mimic treatments were provided to the placebo group by the practitioner. She performed the same movements used by the practitioner during the TT process (the duration was the same as the experimental group). However, instead of centering and holding the intent to help the subject, as the practitioner did in the TT intervention, here, she simply began the treatment and counted back from 100 by serial sevens during the whole treatment. Mimic treatments were given in the patients' rooms. As in the TT treatment, the patients laid on their back on the hospital beds for the treatment. Prior to the first treatment, they were instructed to relax as fully as possible and a brief explanation of what would be done during the mimic treatment was given.

Control Group

For the subjects in the control group, the practitioner did not do any intervention except routine interventions in the ward. The practitioner thanked the participants at the completion of each intervention. Post-intervention data collection was conducted in the same manner for 5 days immediately after each intervention.

Validity and reliability of measures for the dependent variables: pain and fatigue. Melzack (1975) has developed the VAS and found the correlation consistently 0.80 for pre-test and 0.85 for post-test measures. Winstead-Fry (19) has shown that the scale is correlated with the Lee Fatigue Scale ($r = 0.80$) as well as the Profile of Mood

States Scale (POMS) ($r = 0.63$) (19). In the present study, 20 of completed VAS and RFS questionnaires in the first day of pre-test were bisected using the split-half reliability technique and Pearson product moment correlation coefficients were calculated to ascertain reliability. The Pearson correlations for VAS and RFS were $r = 0.82$ and $r = 0.75$, respectively. We did not use test-retest technique because patients' pain and fatigue could vary in two different times.

Results

The sample consisted of 90 subjects divided into the three groups of experimental, placebo and control groups (30 patients in each group). The subjects were evenly distributed in the three groups according to the type and stage of cancer, narcotic analgesic use, numbers of chemotherapy period and interval between the two chemotherapy periods. Table 1 presents the demographic characteristics and some confounding variables for each group.

Table 1. Resident demographic characteristics for each group

Variable (group $n = 30$)	Experimental	Placebo	Control	P -value
Age				ANOVA
Mean (SD)	36.86 (13.15)	42.70 (11.41)	43.30 (12.83)	$P = 0.09$
Education				
No literacy	4 (13.3%)	10 (33.3%)	8 (26.7%)	χ^2
Primary	15 (50%)	16 (53.3%)	10 (33.3%)	$P = 0.21$
Diploma and High	11 (36.7%)	4 (33%)	12 (40%)	
Have career in home				
Yes	24 (80%)	21 (70%)	20 (66.7%)	χ^2
No	6 (20%)	9 (30%)	10 (33%)	$P = 0.25$
Social support resources				
Yes	11 (36.7%)	10 (33.3%)	9 (30%)	χ^2
No	19 (63.3%)	20 (66.7%)	21 (70%)	$P = 0.34$
Surgery treatment				
Yes	22 (73.3%)	21 (70%)	25 (83.3%)	χ^2
No	8 (26.7%)	9 (30%)	5 (16.7%)	$P = 0.45$
Chemotherapy sessions				ANOVA
Mean (SD)	17.5 (15.15)	16.7 (12.96)	21.8 (24.6)	$P = 0.51$
Stage of cancer (TNM criteria)				
II	8 (26.7%)	5 (16.7%)	3 (10%)	χ^2
III	6 (20%)	12 (40%)	12 (40%)	$P = 0.27$
IV	16 (53.3%)	13 (43.3%)	15 (50%)	
Suffering pain				
< 25 min	17 (60.7%)	15 (51.7%)	15 (50%)	χ^2
26–50 min	6 (21.4%)	10 (33.3%)	10 (33.3%)	$P = 0.7$
> 50 min	7 (17.9%)	5 (17.2%)	5 (17.9%)	

Efficacy: Pain Scores

Pain scores of the experimental group were reduced compared to placebo and control groups' pain scores significantly. Since, the scales were administered several times over the 5-day period (10 times to be precise), the repeated measured ANOVA was used for the pain and fatigue scores. The repeated measured ANOVA (the means of difference between the VAS pain scores before and after intervention) showed that there are significant differences between three groups within the 5 days of intervention ($F = 2.01$, $df = 8$, $P = 0.04$, $n = 90$) (Figure 1).

The Tukey HSD test was conducted to locate the differences. The Tukey test of the means of difference between the VAS pain scores before and after the intervention showed that there was a significant difference between the experimental and placebo groups in the first ($P < 0.001$), second ($P < 0.0001$), third ($P < 0.04$), fourth ($P < 0.0001$) and fifth days ($P < 0.006$) and between the experimental and control groups in the first ($P < 0.001$), second ($P < 0.0001$), third ($P < 0.001$), fourth ($P < 0.0001$) and fifth days ($P < 0.0001$). There was no significant difference between the placebo and control groups in the first day ($P < 0.14$), but the differences between the placebo and control groups in the second ($P < 0.0001$), third ($P < 0.005$), fourth ($P < 0.008$) and fifth days ($P < 0.001$) were statistically significant. Figure 1 shows these values for 5 days.

Efficacy: Fatigue Scores

Fatigue scores of the experimental group were reduced compared to placebo and control groups'

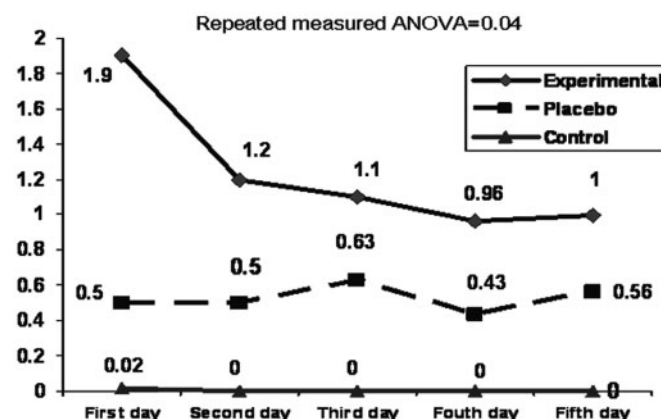


Figure 1. Means of difference between before and after intervention of VAS pain score in three study groups for 5 days. Tukey HSD test: Exp. & Pla. 1 day ($P < 0.001$), 2 days ($P < 0.0001$), 3 days ($P < 0.04$), 4 days ($P < 0.0001$), 5 days ($P < 0.006$); Exp. & Con. 1 day ($P < 0.001$), 2 days ($P < 0.0001$), 3 days ($P < 0.001$), 4 days ($P < 0.0001$), 5 days ($P < 0.001$); Pla. & Con. 1 day ($P < 0.14$), 2 days ($P < 0.001$), 3 days ($P < 0.005$), 4 days ($P < 0.008$), 5 days ($P < 0.001$).

fatigue scores significantly. The repeated measured ANOVA (the means of difference between the RFS fatigue scores before and after the intervention) showed that there were significant differences between the three groups within the 5 days of intervention ($F = 3.18$, $df = 8$, $P = 0.002$, $n = 90$) (Figure 2).

The Tukey HSD test was conducted to locate the differences. The Tukey test of the means of difference the RFS fatigue scores between before and after intervention showed that there was a significant difference between the experimental and placebo groups in the first ($P < 0.001$), second ($P < 0.0001$), third ($P < 0.03$), fourth ($P < 0.0001$) and fifth days ($P < 0.0001$) and also between the experimental and control groups in the first ($P < 0.001$), second ($P < 0.0001$), third ($P < 0.001$), fourth ($P < 0.001$) and fifth days ($P < 0.001$). There was no significant difference between the placebo and control groups in the first ($P < 0.18$), fourth ($P < 0.43$) and fifth days ($P < 0.68$), while there was a significant difference between the placebo and control groups in the second ($P < 0.05$) and third days ($P < 0.001$). Figure 2 shows these values for 5 days.

Discussion

Complementary and alternative medicine (CAM) use among people is generally high. Goldstein *et al.* (20) found that those reporting a diagnosis of cancer and those who report other chronic health problems indicate a similar level of visits to CAM providers (20).

CAM therapies have been shown to decrease anxiety and depression, to minimize pain and to boost immune functioning. A systematic review of the evidence for the efficacy of CAM in treating pain, dyspnea and nausea and vomiting for patients near the end of life was conducted. The efficacy of various CAM modalities was

evaluated in 21 studies of symptomatic adult patients. The review found that acupuncture, transcutaneous electrical nerve stimulation, supportive group therapy, self-hypnosis and massage therapy may provide some pain relief for patients with cancer and/or patients who are dying (1).

The present trial aimed at testing the efficacy of TT (as a CAM) in the cancer patients suffering from chronic pain and fatigue. The results demonstrated that TT is significantly more effective on the pain and fatigue of the experimental group than on the placebo and control groups. RCT studies for TT are frequently quoted in support of this result. Ekes Peck (21) showed that the TT decreased the pain in elders suffering from degenerative arthritis (in this study, the comparative group was undergoing progressive muscle relaxation and the TT periods were six times) (21). The findings by Abbot *et al.* (22) showed that spiritual healing, as a therapy for chronic pain, significantly decreased pain intensity during the sessions of therapies (22). Also, Denison (23) found that TT decreased the intensity of pain in the patients with Fibro-Myalgia Syndrome during the six sessions of TT. Wez *et al.* (24) found that the healing by gentle touch decreased pain in the clients with cancer within the six sessions of treatment.

Post-White *et al.* (25), by a study on 'Therapeutic Massage and Healing Touch and Symptoms in Cancer', demonstrated that massage touch lowered anxiety and healing touch lowered fatigue, and that both lowered total mood disturbance. Pain ratings were lower after massage touch and healing touch, when using less non-steroidal anti-inflammatory drugs for 4 weeks (25). The significant results are encouraging, since three different individuals in three different facilities administered the TT in the experimental group. These results suggest that treatment is not dependent on the individual attributes of the intervention.

The significant difference between the control and placebo groups is of interest. A distinct positive linear trend of decreasing pain and fatigue scores was noted when the experimental group was compared to the control group. Therefore, these differences indicated the independent effect of TT on the pain and fatigue of the cancer patients. The trend of decreasing pain and fatigue in the placebo group when compared to the control group indicated a placebo effect in TT.

Practitioner's presence with distraction may have a positive effect on the pain and fatigue of the patients. Controversy exists on whether the TT intervention itself produces the desired response or if the patient responds to the presence of a caring professional. Presence procedure is an important nursing intervention, helpful in reducing anxiety. Several studies have used presence procedure to control the intent of the practitioner as a placebo effect (26, 27).

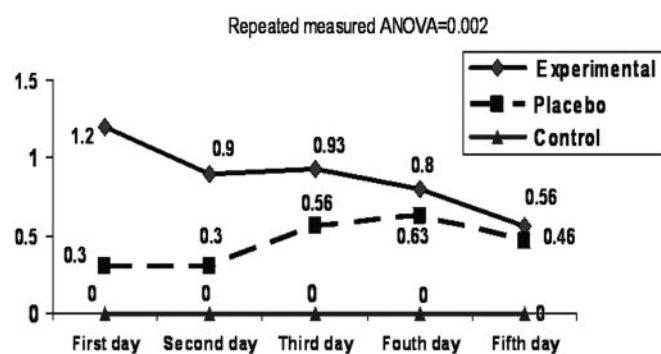


Figure 2. Means of difference between before and after intervention of RFS fatigue score in three groups for 5 days. Tukey HSD test: Exp. & Pla. 1 day ($P < 0.001$), 2 days ($P < 0.0001$), 3 days ($P < 0.03$), 4 days ($P < 0.0001$), 5 days ($P < 0.0001$); Exp. & Con. 1 day ($P < 0.001$), 2 days ($P < 0.0001$), 3 days ($P < 0.001$), 4 days ($P < 0.001$), 5 days ($P < 0.001$); Pla. & Con. 1 day ($P < 0.18$), 2 days ($P < 0.05$), 3 days ($P < 0.001$), 4 days ($P < 0.43$), 5 days ($P < 0.68$).

TT is set apart from many other alternative healing modalities, as well as, from scientific medicine, by its emphasis on the healer's intention. Whereas, the testing of most therapies requires controlling for the placebo effect (often influenced by the recipient's belief about efficacy), TT theorists suggest that the placebo effect is irrelevant (28). The placebo TT may be interpreted as compassionate touch, one-one social interaction or nursing presence, all of which are known to have positive effects (29). If the placebo intervention is interpreted as any of these three categories of intervention, it may explain a decrease in pain and fatigue of cancer patients in the placebo group.

Limitations of the Study

Conducting a study in three group trials presents several challenges, for there are numerous factors over which the researcher has no control. All of the facilities used in the present study were considerable for the practitioner, although an effort was made to maintain consistent facilities and environmental conditions, but some conditions such as room temperature and noise were uncontrollable. In addition, the study may be limited by the participation of the principal investigator in the intervention in one of the facilities. However, a larger sample in a future studies could verify this positive trend.

Implications for Research

The positive findings of this study support a growing body of evidence that non-invasive, non-pharmacological interventions such as TT are effective for decreasing pain and fatigue of the cancer patients undergoing chemotherapy with none of the untoward side effects of psychotropic medications. One future thrust for researches examining the effect of TT on pain and fatigue of the cancer patients undergoing chemotherapy is to examine physiological correlates to shed some light on the mechanism of action of TT. This information can provide valuable knowledge regarding the conditions under which TT is most effective. Some questions include: Is there a time of day that determines the degree of effect? Is there a 'loading dose' requirement? What is the optimal length of treatment for determining dose-response? Future studies could test varying length of intervention for optimal effect.

Additional questions are: What is the best specific protocol for administering TT for the cancer patients undergoing chemotherapy who have pain and fatigue? Can therapeutic touch also be used to decrease depression, anxiety and stress in these patients?

Implications for Practice

Nursing is intimately involved with human care. TT is one modality to convey caring. A paucity of information related to the specific interventions for pain and fatigue in the cancer patients undergoing chemotherapy exists, suggesting that TT can be used to decrease pain and fatigue of such patients and could be included in a total philosophy of care for the people with cancer that focuses on compassionate care.

Nurses are responsible for providing and managing the care of cancer patients undergoing chemotherapy in many settings: long-term care, adult day care, assisted living and at home. At a time when cost containment is a consideration in health care, TT is a modality that is non-invasive, readily learned, and can provide a non-pharmacological intervention for the selected pain and fatigue of the these patients. TT can be applied in many different settings such as home or day care, and requires no specialized equipment. This non-pharmacological intervention warrants further nursing researches especially in vulnerable populations (such as neonates and the frail elderly), for whom invasive therapies are problematic.

Acknowledgments

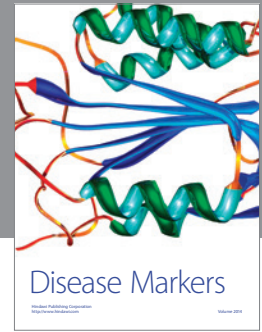
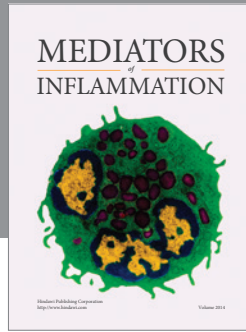
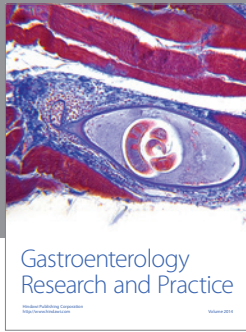
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