ORIGINAL ARTICLE

Gulhan Kocaman[1]
Neriman Cetin Benli[2]

[1]Karabuk University, Faculty of Dentistry, Department of Periodontology, Karabuk, Turkey.
[2]Ministry of Health, Bağlar Family Health Center, Safranbolu, Karabuk, Turkey

Corresponding Author:
Gulhan Kocaman
Karabuk University, Faculty of Dentistry, Department of Periodontology, Karabuk, Turkey
Tel: +90 505 770 54 25
E-mail: dentist25@hotmail.com

Received: 27.04.2019
Acceptance: 08.06.2019
DOI: 10.18521/ktd.570696

Konuralp Medical Journal
e-ISSN1309–3878
konuralptipdergi@duzce.edu.tr
konuralptipdergisi@gmail.com
www.konuralptipdergi.duzce.edu.tr

The Effects of Music Therapy on Vital Signs and Dental Anxiety Prior to Dental Surgery

ABSTRACT

Objective: Dental surgery is performed under local anesthesia and the patient's consciousness is clear during the surgery, resulting in increased anxiety in the patient and the development of surgical complications. To investigate the effects of music therapy on vital signs and dental anxiety prior to periodontal surgery.

Methods: Having received their informed consents prior to surgery, in the scope of this study, a questionnaire including Corah Dental Anxiety Scale was applied to 35 patients admitted to Oral and Dental Health Centre's Periodontology Clinic for periodontal surgery. Vital signs and mouth opening measurements including blood pressure, pulse and respiration were performed. Then the music therapy was performed. In the application of music therapy, the patients were asked to take the position they feel most comfortable in, couchant or seated, and close their eyes while the setting was kept quiet. With headphones, they were exposed to the soothing sound of water and reed flute. After the application, vital signs and mouth opening measurement were re-evaluated.

Results: In our study, 68.8% of the patients stated that dental treatment was not fearful but the rate of dental anxiety before dental surgery was found to be 85.7%. It was found that systolic blood pressure, diastolic blood pressure, pulse and mouth opening measurements of the patients were significantly affected ($p < 0.05$) and no statistically significant changes were observed in the respiratory system.

Conclusions: The music therapy performed before periodontal surgery was found to be a cost-effective, painless, non-adverse non-pharmacological sedative and anxiolytic on vital signs and mouth opening.

Keywords: Music Therapy, Dental Anxiety, Anxiety, Dental Surgery, Preoperative Sedation

Müzik Terapinin Dental Cerrahi Öncesi Dental Anksiyete ve Vital Bulgular Üzerine Etkisi

ÖZET

Amaç: Lokal anestezi altında yapılan dental cerrahiler hastada artan endişe ve cerrahi komplikasyonların gelişmesine neden olur. Bu çalışma periodontal cerrahi öncesi dental anksiyete düzeyini belirlemek ve uygulanan müzik terapinin vital bulgular ve üzerindeki etkilerini araştırmak için planlanmıştır.

Gereç ve Yöntem: Cerrahi öncesinde bilgilendirilmiş onamlarını almış olan bu çalışma Ağız ve Diş Sağlığı Merkezi Periodontoloji Kliniğine periodontal cerrahi kliniğine başvuran 35 hastaya Corah Dental Anksiyete Ölçeği içeren bir anket uygulanmıştır. Vital bulgular ve kan basıncı, nabız ve solunum dahil ağız açıklığı ölçümleri yapıldı. Sonra müzik terapisi yapıldı. Müzik terapisi uygulamasında, hastalardan en rahat hissedecekleri pozisyona geçmeleri, oturma yerlerinde oturmaları ve ayar sessiz tutulurken gözlerini kapatmaları istendi. Kulaklıklarla, sakinleştirici su sesine ve kamış flütüne maruz kaldılar. Uygulama sonrası vital bulgular ve ağız açıklığı ölçümü tekrar değerlendirildi.

Bulgular: Çalışmamızda hastaların% 68.8'i diş tedavisinin korkmadığını ifade etmiş ancak diş cerrahisi öncesi dental anksiyete oranının% 85.7 olduğu belirlendi. Hastaların sistolik kan basıncı, diyastolik kan basıncı, nabız ve ağız açıklığı ölçümlerinin anlamlı derecede etkilendiği ($p < 0.05$) ve solunum sisteminde istatistiksel olarak anlamlı bir değişiklik olmadığı tespit edildi.

Sonuç: Periodontal cerrahi öncesi yapılan müzik terapisinin, yaşamsal belirtilerde ve ağız açıklığında, maliyet etkin, ağrısız bir farmakolojik olmayan yatıştırıcı ve anksiyolitik olduğu bulundu.

Anahtar Kelimeler: Müzik Terapi, Dental Anksiyete, Anksiyete, Dental Cerrahi, Preoperatif Sedasyon

INTRODUCTION

The dental surgical interventions performed under local anesthesia may cause fear and anxiety in the patient (1-3). Anxiety is a serious problem which is frequently encountered both in everyday life and in many areas of medicine and may cause several complications. Anxiety problem can be solved by increasing the probability of treatment of the patient and thus enhancing the healthiness of the patient and also by channeling the physician's focus on the treatment to attain success in a short time (4). Dental anxiety develops depending on the practice of dentistry and is more specific than general anxiety. Dentophobia includes feelings such as not wanting to go to the dentist, fear, disgust or dislike as part of a psychological bias. It is defined as the patient's responses stemming from the specific stresses they encounter during the dental treatment (5,6). Despite the modern technological applications in dentistry, the fear of anxiety and pain persists against the dental treatment and surgical applications. The basis of these emotions is the sound generated when working with various instruments in the mouth, the need to keep the mouth open or the fear of needles (7,8). In dental surgery, despite the application of local anesthesia, the sensation of touch-pressure continues throughout the procedure and causes the anxiety to continue as a conscious anxiety during surgery.

Dental fear and anxiety cause many physiological and behavioral responses in patients. The first and most important anxiety symptom observed in the patients is irregular breathing (9,10). Tightness in the jaws, tightening of the teeth, tension in the muscles and stiffness in the extremities, cold sweating and tremor, changes in blood pressure, arterial and pulse, syncope, hyperesthesia, paresthesias and dizziness may be observed at different degrees and severity in each individual (11,12). Anxiety can also be observed in every individual at different severity and degrees. Furthermore, the tolerance threshold for each individual may also vary (12).

In individuals with dental fear, postponement of dentist appointments and even avoidance of dentists are seen (13). It has been emphasized that anxiety can be an obstacle for the actual practice of dentistry and dental surgery and may increase the incidence of oral diseases. In patients with high levels of anxiety prior to surgery, more complications and delayed recovery were reported in the postoperative period (14). In addition to pharmacological treatments, non-pharmacological psychosedative techniques are used to eliminate anxiety prior to dental surgery (15).

Sound and music have been the subject of many pieces of research and studies with their effects on mood and vital functions (16). The positive and healing effect of music has been the subject of continuous curiosity from the past to the present and has been used frequently for treatment purposes. Especially Sufis, in Islamic civilization, used music and advocated that music had a healing effect (17). Today, music therapy is evaluated as an efficient, inexpensive and a safe anxiolytic (18). Music therapy is suggested to provide relaxation acting on the autonomic nervous system (19). Music played at a low pitch and slow tempo reduces the ability of the nervous transition which normally regulate emotions that cause discomfort and anxiety, thus affecting the limbic system of the brain, which is the center of emotion and excitement (20). In the literature, it is reported that the application of music therapy to the patient in the preoperative period will reduce the anxiety and perception of pain, prevent the complications that occur due to anxiety and thus accelerate the recovery (21).

The aim this study was to investigate the effectiveness of music therapy on regulating the vital signs and dental anxiety level before periodontal surgery performing under local anesthesia.

MATERIAL AND METHODS

This study was carried out with the approval from Karabük University Non-Interventional Clinical Research Ethics Committee on 01/11/2017 with the ethics committee approval numbered 10/7. The cross-sectional study was conducted between November 2017 and May 2018 in Karabuk Oral and Dental Health Centre's Periodontology Clinic. A total of 35 patients who were admitted to the Periodontology Clinic and who were in need of periodontal surgery and who met the research criteria were included in the study. On a voluntary basis, the patients in the study group were informed about the aims and benefits of the study and their role in it and were asked to fill in the data collection form and their informed consent was obtained.

The data collection form consists of three parts. The first part included the sociodemographic information of the patients; the second part included the Dental Anxiety Scale developed by Corah and the last part consisted of the patient follow-up form to register the vital signs of these patients. The Corah Dental Anxiety Scale (22) is a five-point Likert-type scale designed to measure how anxious and worried people feel about themselves in dental procedures. The highest score that can be obtained from the scale is 20 and the lowest is 4. The high score indicates that the person has a high level of anxiety. The total dental anxiety score obtained by summing all the points given to the four questions was evaluated as 4-7 points = no anxiety, 8-20 points = anxiety.

The demographic information and anxiety scales were taken prior to the periodontal surgery and systolic and diastolic blood pressures and pulses of the patients were measured using a digital

sphygmomanometer (Omron, Matsusaka Ca Ltd, Japan). Before the study, the device was calibrated. Patients' respiration rates, 1-minute diaphragm movement number were taken, and mouth opening was measured by a single standard investigator with the help of a caliper. The patients were then asked to sit on a dental unit or lay down, to take the position they felt most comfortable and to close their eyes. The setting was kept quiet. Through headphones, patients were exposed to the relaxing sounds of water and reed flute, in a low tone for 30 minutes. Following the music therapy application, vital signs and mouth opening measurements were re-evaluated.

Whether there were statistically significant differences between the groups in the statistical evaluation was analyzed by Student's t-test, and the non-normally distributed continuous variables were evaluated by Mann Whitney U test. Repeated measures of variance analysis were used for intra-group measurements, Bonferroni-correction multiple comparison test was performed in cases where this analysis was found to be significant. Whether there were significant differences in the intra-group repeating OAA / SS measurements was evaluated by means of the Friedman test, and the Bonferroni-correction and Wilcoxon signed rank tests were performed when it was found statistically significant. Categorical variables were evaluated by Pearson's Chi-Square and Fisher's exact result probability test. P was taken as <0.05 in all evaluations.

RESULTS

The sociodemographic attributes of the patients are given in Table 1. The socio-demographic characteristics of the patients such as age, gender, educational status, and income status are presented in Table 1. Of the 35 cases in the study, 60% were female and 40% were male and the mean age was 42.48 years. 80% of the participants were married and 20% were single. 37.1% of the participants were primary education graduates, 25.7% high school, 37.1% had a bachelor and higher degree, 51.4% had low-income status, 48.6% came from middle and high-income group. 80% of the patients live in the nuclear family while 60% reside in an urban area. While 34.3% of the patients participated in the study had systemic disease, 40% had continuous medication use. The rate of patients who underwent surgery under local anesthesia was 34.3% and the rate of patients who previously underwent dental surgery was 31.4 %. 31.4% of the participants find dental treatment fearful.

Table 1. Sociodemographic attributes of the patients

		N	%
Age 42,48±11,5 (min=22, max=72)			
Gender	Female	21	60.0
	Male	14	40.0
Marital status, n (%)	Married	28	80.0
	Single	7	20.0
Educational status	Primary school	13	37.1
	High school	9	25.7
	University and higher	13	37.1
Income status	Low	18	51.4
	Middle and high	17	48.6
Type of family	Nuclear	28	80.0
	Extended	7	20.0
Place of residence	Town-district	14	40.0
	City	21	60.0
Do you have any systemic disease?	None	23	65.7
	Available	12	34.3
Do you use any continuous medication?	No	21	60.0
	Yes	14	40.0
Have you ever undergone surgery under local anesthesia?	No	23	65.7
	Yes	12	34.3
Have you ever had dental surgery before?	No	24	68.6
	Yes	11	31.4
Do you find dental treatment a fearful experience?	No	24	68.6
	Yes	11	31.4
Total		35	100

Anxiety values of the participating before periodontal surgery are given in Table 2. While anxiety was not present in 14.3% of the patients participating before periodontal surgery, the presence of anxiety was evaluated in 85.7% of the patients.

Table 2. Anxiety values of the patients before periodontal surgery.			
Corah's Dental Anxiety Scale			
	No Anxiety	**Have Anxiety**	**Total**
n (%)	5 (14.3)	30 (85.7)	35 (100.0)

The comparison of patient's vital signs before and after music therapy are given in Table 3. The mean pre-music therapy systolic blood pressure (SBP) of the patients was found 136,85 ± 21,11 mmHg and the mean post-music therapy SBP was found to be 128,20 ± 18,09 mmHg and the difference was found statistically very significant (p <0.01). The mean pre-music therapy diastolic blood pressure (DBP) was found 84.85 ± 10.94 mmHg and the mean post-music therapy DBP was found to be 80.57 ± 9.8 mmHg and the difference was found statistically very significant (p <0.00). The mean pulse rate of the patients before the music therapy was 83.45 ± 7.36 minutes and the mean the pulse rate after the music therapy was recorded 82.22 ± 7.42 minutes and the difference was statistically significant (p <0.05). The mean respiration rate of the patients before the music therapy was 15.48 ± 1.59 minutes and the mean the respiration rate after the music therapy was found to be 15.31 ± 1.30 minutes and the difference was not found statistically significant (p>0.05). The mean pre-music therapy mouth opening rate was found 44.31 ± 5.35 mmHg and the mean post-music therapy mouth opening rate was found to be 44.88 ± 5.22 mmHg and the difference was found statistically very significant (p <0.01).

Table 3. Comparison of patient's vital signs before and after music therapy

Vital signs	Before music therapy	After music therapy	P-value
Systolic blood pressure (mmhg)	136.85 ± 21.11	128.20 ± 18.09	**.000**
Diastolic blood pressure (mmhg)	84.85 ± 10.94	80.57 ± 9.68	**.004**
Pulse (min)	83.45 ± 7.36	82.22 ± 7.42	**.027**
Respiration (min)	15.48 ± 1.59	15.31 ± 1.30	.226
Mouth opening	44.31 ± 5.35	44.88 ± 5.22	**.003**

P < 0,05 was taken as significant; Paired t test Data mean ± were shown as sd

DISCUSSION

The aim of this study was to investigate the effects on vital signs of pre-operative music therapy and anxiety levels of patients who came for dental surgery. Fear of dental treatment is common and may affect more than half of the general population. Anxiety is an important issue in the dental care of adults, children and adolescents and dental anxiety affects 10-20% of adults and 43% of children and adolescents (1,2). Surgical applications in dentistry are strongly alarming. High levels of anxiety have been reported for pain before periodontal scaling / surgical treatment in patients on periodontal therapy (3). The periodontal surgery process and recovery time is rarely life-threatening, but the physical and psychological impact makes it a stressful condition.

Corah Dental Anxiety Scale (CDAS) is one of the most frequently used dental anxiety scales used to determine dental anxiety levels in adults. CDAS, which aims to determine the dental anxiety level, was introduced by Corah in 1969 (22). A total of four questions, the sum of the responses to the numerical answers of the person gives information about the level of dental anxiety. Corah Dental Anxiety Scale evaluates the relationship between score and dental anxiety. Corah Dental Anxiety Scale is an assessment scale with ease of application and adequate psychometric properties (4). In our study, dental anxiety before periodontal surgery was identified in 85.7% of the patients Local surgical procedures and open consciousness during surgery are the main reasons for increased anxiety. According to the study conducted by Muglali et al. in 2008, 30% of patients undergoing oral surgery had mild, 40% moderate, 14% high, and 11% very high levels of anxiety and only 5% of patients with no anxiety were reported (23).

Dental anxiety can often be managed by pharmacological interventions, non-pharmacological interventions, or both. Pharmacological interventions include benzodiazepines, nitrous oxide, general anesthesia and other agents (chloralhydrate and hydroxyzine). Conscious sedation practice in dentistry has increased the cost of dental treatment as well as various undesirable effects and risks. Inhalation includes sedation (nitrogen oxide), conscious intravenous sedation and oral sedation, and their cost is high. The cost of professional dental care is very important for compliance with treatment. And pharmacological managements disadvantages reduce nausea, vomiting, respiratory depression, heart rate and blood pressure. As a result, the importance of alternative therapies with sedative effect has increased. Non-pharmacological interventions include virtual reality, audiovisual distraction, musical distraction, strengthening, show - tell and so on (5,6).

In recent years, it has been stated that there is a close relationship between music and health care systems, which is a complementary treatment, and it is a cheap, safe, painless treatment method (24). The music used in therapy is regulated by slow tempo, repetitive rhythm, soft lines and strings (7,8). Music therapy is a non-pharmacological treatment that aims to maintain the well-being of people (25).

During preoperative dental anxiety in order to combat the stress of the organism, it has been reported that blood pressure increases, heart rate and breathing are accelerated and muscles are stretched. In the studies, it is stated that music therapy causes physical and psychological reactions in the body by acting on the limbic system and stimulates the parasympathetic nervous system and causes changes in physiological findings such as blood pressure, pulse and respiration (16). According to the study results, before and after music therapy systolic and diastolic blood pressure values were compared, there was found a significant decrease in the systolic blood pressure (SBP) and diastolic blood pressure (DBP) scores, which were previously found in high levels when they were compared together, and the difference was found statistically significant. ($p < 0.01$, Table 3). These results demonstrate that music therapy applied before periodontal surgery is effective in reducing SBP and DBP.

Loomba et al. stated that in meta-analysis of investigating the effects of music on the patient's life findings, music therapy had beneficial effects on the reduction of SBP, DBP and pulse in various clinical settings such as preoperative environment and intensive care unit and these physiological changes may be the result of patient anxiety relief (26). Rubalcava et al. reported that music therapy had a positive effect on the control of dental anxiety and significant differences in salivary cortisol concentration, systolic-diastolic pressure, heart rate, body temperature, and stimulated saliva flow (11). Wong et al., in their study, found that patients' exposure to 30-minute with tape recorder music therapy resulted in a decrease in their SBP values (27). In this respect, it may be argued that music therapy is an independent intervention that can be applied to decrease the blood pressure value (27).

In the study, pulse rate averages were re-measured after music therapy and the difference was statistically significant ($p < 0.05$, Table 3). Korhan et al., the study investigating the effects of music therapy on physiological symptoms of anxiety in patients receiving mechanical ventilator support, found a decrease in the pulse rate values of the participants was reported, yet; no statistically significant difference was found the significantly lower respiratory rates, and systolic and diastolic blood pressure of the patients during a comparison of study and the control groups (28). Angela et al., in their study on the effects of music therapy on vital signs in patients on mechanical ventilator support, had the experiment group exposed to music for 30 minutes and their pulse rates were measured 5 times during the intervention. As a result of the study, it was determined that there was a decrease in the experimental group compared to the control group (29). In a study carried out by Almerud et al. on the patients who received mechanical ventilator support in intensive care unit, the experiment group received music therapy for 60 minutes and pulse rate values were obtained during the intervention. At the end of the study, it was reported that there was a significant decrease in the pulse rate values of the experimental group (30). In our study, similarly, it was found to be effective in decreasing the increased pulse values due to anxiety before dental surgery.

The mean mouth opening before and after the music therapy was compared and the difference was found statistically significant ($p < 0.01$, Table 3). The limitation in mouth opening is due to the response of the muscles of mastication to stress. Restricted jaw with reduced mouth opening will make the operation all the more difficult both for the patient and the physician. The sedative effect of the music therapy which is applied prior to the surgery will create positive results for the patient and the surgeon during the treatment.

In conclusion; according to the results of the study designed to examine the effect of music therapy on vital signs of the patients before periodontal surgery, it was observed that music therapy had a positive, significant contribution to the vital signs of the patients. Considering the useful results proposed in the literature, we argue that music therapy is an inexpensive, pain-free and non-adverse non-pharmacological method which can be used to relieve anxiety prior to surger

REFERENCES

1. Suchetha A, Tanwar E, Darshan B, Bhat ASD. Post-operative complications after periodontal surgery. Anxiety. 2018;15:16.
2. Boyar R, Cross M. Temperament and trait anxiety as predictors of child behavior prior to general anesthesia for dental surgery. Pediatr Dent. 1997;19(19):427-431.
3. Cohen S, Fiske J, Newton J. Behavioural dentistry: The impact of dental anxiety on daily living. Br dentl j. 2000;189(7):385.
4. Hill K, Hainsworth J, Burke F, Fairbrother K. Evaluation of dentists' perceived needs regarding treatment of the anxious patient. Br dent j. 2008;204(8):E13.

5. Leutgeb V, Übel S, Schienle A. Can you read my pokerface? A study on sex differences in dentophobia. Eur j oral sci. 2013;121(5):465-470.
6. Dorofeev A. Assessment of Pain Perception of Elderly Patients with Different Levels of Dentophobia during Surgical Dental Appointment. Asian J Pharm. 2018;12(03).
7. Economou GC. Dental anxiety and personality: investigating the relationship between dental anxiety and self-consciousness. J Dent Educ. 2003;67(9):970-980.
8. Asl AN, Shokravi M, Jamali Z, Shirazi S. Barriers and drawbacks of the assessment of dental fear, dental anxiety and dental phobia in children: a critical literature review. J Clin Pediatr Dent. 2017;41(6):399-423.
9. Fukayama H, Yagiela JA. Monitoring of vital signs during dental care. Int dent j. 2006;56(2):102-108.
10. Hmud R, Walsh LJ. Dental anxiety: causes, complications and management approaches. J Minim Interv Dent. 2009;2(1):67-78.
11. Christian LM, Graham JE, Padgett DA, Glaser R, Kiecolt-Glaser JK. Stress and wound healing. Neuroimmunomodulation. 2006;13(5-6):337-346.
12. Appukuttan DP. Strategies to manage patients with dental anxiety and dental phobia: literature review. Clin Cosmet Investig Dent. 2016;8:35.
13. Crego A, Carrillo M, Armfield JM, Romero M. From public mental health to community oral health: the impact of dental anxiety and fear on dental status. Front Public Health. 2014;2:16.
14. Wilson TD, McNeil DW, Kyle BN, Weaver BD, Graves RW. Effects of conscious sedation on patient recall of anxiety and pain after oral surgery. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2014;117(3):277-282.
15. Ng SK, Chau AW, Leung WK. The effect of pre- operative information in relieving anxiety in oral surgery patients. Community Dent Oral Epidemiol. 2004;32(3):227-235.
16. Hosseini SE, Hosseini SA. Therapeutic Effects of Music: A Review. Report of Health Care. 2018;4(4):1-13.
17. Tolunay T, Bicici V, Tolunay H, et al. Rhythm and orthopedics: The effect of music therapy in cast room procedures, a prospective clinical trial. Injury. 2018;49(3):593-598.
18. Thaut MH. The future of music in therapy and medicine. Ann N Y Acad Sci. 2005;1060(1):303-308.
19. Tomaino CM. Music therapy and the brain. Music therapy handbook.Guilford press.Newyork, London. 2015:40-50.
20. Smith FS. Music Therapy: A PACU Evidence-Based Practice Project. J Perianesth Nurs. 2017;32(4):e54.
21. Koch ME, Kain ZN, Ayoub C, Rosenbaum SH. The sedative and analgesic sparing effect of music. Anesthesiology. 1998;89(2):300-306.
22. Corah NL, Gale EN, Illig SJ. Assessment of a dental anxiety scale. J Am Dent Assoc (1939). 1978;97(5):816-819.
23. Muglali M, Komerik N. Factors related to patients' anxiety before and after oral surgery. J Oral Maxillofac Surg. 2008;66(5):870-877.
24. Bradt J, Teague A. Music interventions for dental anxiety. Oral diseases. 2018;24(3):300-306.
25. Goettems ML, Zborowski EJ, dos Santos Costa F, Costa VPP, Torriani DD. Nonpharmacologic intervention on the prevention of pain and anxiety during pediatric dental care: A systematic review. Acad Pediatr. 2017;17(2):110-119.
26. Loomba RS, Arora R, Shah PH, Chandrasekar S, Molnar J. Effects of music on systolic blood pressure, diastolic blood pressure, and heart rate: a meta-analysis. Indian Heart J. 2012;64(3):309-313.
27. Wong H, Lopez-Nahas V, Molassiotis A. Effects of music therapy on anxiety in ventilator-dependent patients. Heart Lung. 2001;30(5):376-387.
28. Korhan EA, Khorshid L, Uyar M. The effect of music therapy on physiological signs of anxiety in patients receiving mechanical ventilatory support. Clin J Oncol Nurs. 2011;20(7- 8):1026-1034.
29. Lee OKA, Chung YFL, Chan MF, Chan WM. Music and its effect on the physiological responses and anxiety levels of patients receiving mechanical ventilation: a pilot study. Clin J Oncol Nurs. 2005;14(5):609-620.
30. Almerud S, Petersson K. Music therapy—a complementary treatment for mechanically ventilated intensive care patients. Intensive Crit Care Nurs. 2003;19(1):21-30.