EURASIAN JOURNAL OF HEALTH SCIENCES
e-ISSN 2651-3501

Eurasian JHS 2024; 7(3): 233-240

Review Article/
Derleme Makalesi

Correspondence: Servet KALYONCUO
E-mail: servetkalyoncuo@erciyes.edu.tr

Acupressure and Nursing in Pain Management of Patients Undergoing Coronary Angiography (CAG)

Servet KALYONCUO

Department of Internal Medicine Nursing, Institute of Health Sciences, Erciyes University, Kayseri, TURKEY

ORCIDS: 0000-0001-8687-2229

ABSTRACT

Patients undergoing coronary angiography (CAG) experience pain during the withdrawal of the catheter inserted into the femoral artery, and as a result, vital signs and comfort levels of patients are negatively affected. It has been reported that if the pain experienced during femoral catheter withdrawal after CAG is not controlled, patients' ability to cooperate during catheter removal is adversely affected, haemostasis time is prolonged, vital signs may change and vasovagal reactions may develop. In addition, it is also known that pain experienced after CAG leads to anxiety and psychological disorders. Therefore, pain should be controlled during femoral catheter extraction after CAG. Although the use of pharmacological agents is recommended for the management of pain during femoral catheter extraction, analgesics do not reduce pain-related complications and are reported to be a costly method. Therefore, the use of non-pharmacological methods for the management of pain related to femoral catheter removal is of great importance. Acupressure is among the non-pharmacological methods that have an important place in the health care of nurses. Nurses can apply acupressure as a part of nursing care to reduce pain and anxiety of patients and to increase patient comfort. However, the number of studies on the effects of acupressure in the management of pain related to removal of femoral catheter after CAG is quite limited. In this review, it is aimed to contribute to the determination of the efficacy of acupressure, which is an integrated treatment method for pain relief in individuals who experience post-CAG pain.

Key words: Coronary angiography, Pain, Acupressure, Nursing.

Koroner Anjiografi (KAG) Uygulanan Hastaların Ağrı Yönetiminde Akupresür ve Hemşirelik

ÖZ

Koroner anjiyografi (KAG) yapılan hastalar, femoral artere yerleştirilen kateterin çekilmesi sürecinde ağrı yaşamakta, bunun sonucunda da hastaların vital bulguları ve konfor düzeyleri olumsuz yönde etkilenmektedir. KAG sonrası femoral kateter çekimi sırasında yaşanan ağrı kontrol altına alınmadığı takdirde hastaların kateter çıkarılması sırasında iş birliği yapma yeteneğinin olumsuz etkilendiği, hemostaz süresinin uzadığı, yaşam bulgularında değişiklik olabileceği ve vazovagal reaksiyonların geliştiği belirtilmektedir. Ayrıca KAG sonrası yaşanan ağrının anksiyete ve psikolojik rahatsızlıklara yol açtığı da bilinmektedir Bu nedenle KAG sonrası femoral kateter çekimi sırasında ağrının kontrol altına alınması gerekmektedir. Femoral kateter çekimi sırasında yaşanan ağrının yönetiminde farmakolojik ajanların kullanımı önerilse de analjeziklerin ağrı ile ilgili komplikasyonları azaltmadığı ve maliyetli bir yöntem olduğu bildirilmektedir. Bu nedenle femoral kateterin çıkarılması ile ilgili ağrının yönetimi için non-farmakolojik yöntemlerin kullanılması büyük önem taşımaktadır. Akupresür, hemşirelerin sağlık bakımı kapsamında önemli bir yer tutan non-farmakolojik yöntemler arasındadır. Hemşireler hastaların ağrı ve anksiyetesini azaltmak ve hasta konforunu artırmak için hemşirelik bakımlarının bir parçası olarak akupresür uygulayabilmektedirler. Bununla birlikte, KAG sonrası femoral kateterin çıkarılması ile ilgili ağrının yönetiminde akupresürün etkileri ile ilgili çalışma sayısı oldukça sınırlıdır. Bu derlemede KAG sonrası ağrı yaşayan bireylerde ağrının hafifletilmesi/giderilmesi için bütünleşik bir tedavi yöntemi olan akupresürün ağrıya ilişkin etkinliğinin belirlenmesine katkıda bulunmak amaçlanmaktadır.

Anahtar kelimeler: Koroner anjiorafi, Ağrı, Akupresür, Hemşirelik.

DOI: 10.53493/avrasyasbd.1444019 Received: 27.02.2023 Accepted: 11.06.2024

INTRODUCTION

Cardiovascular diseases are among the leading causes of death in the world and in our country. Among cardiovascular diseases (CVD), coronary artery disease (CAD) remains an important health problem with high rates of mortality and morbidity (Virani 2020). Coronary angiography (CAG) is one of the commonly used revascularization methods in the treatment of CAD. Although the transradial route has become popular in recent years due to the low incidence of complications, increased patient comfort and early mobilization, the transfemoral method is still frequently used in CAGs due to its ease of application and high experience (Jhand et al. 2021; Özyurtlu et al. 2022). The majority of patients experience pain during compression during removal of the catheter placed in the femoral region after CAG (Bayındır et al. 2017; Heidaranlu et al. 2021). It has been reported that if the pain experienced during femoral catheter withdrawal after CAG is not controlled, patients' ability to cooperate during catheter removal is negatively affected, hemostasis time is prolonged, changes in vital signs may occur, and vasovagal reactions develop (Bayindir et al. 2017; Ghods et al. 2022; Heidaranlu et al. 2021). In addition, it is also known that post-CAG pain causes anxiety and psychological disorders. Therefore, it is necessary to control the pain during femoral catheter extraction after CAG. Although the use of pharmacologic agents is recommended for the management of pain during femoral catheterization, analgesics do not reduce pain-related complications and are reported to be a costly method (Paul et al. 2022). Therefore, the use of non-pharmacologic methods for the management of pain related to femoral catheter removal is of great importance. Non-pharmacological approaches include acupressure, music therapy, reflexology, relaxation technique, aromatherapy, guided imagery and yoga (Godley and Smith 2020; İster and Altınbaş 2022; Li et al. 2021; Mehta et al. 2016; Rizi et al. 2017; Topdemir and Sarıtaş 2021; Vagharseyyedin et al. 2022).

Acupressure application is a complementary and integrated treatment method that increases the independent functions of nurses and improves nurse-patient interaction, although it is an application included in the Nursing Intervention Classification (NIC) (Godley and Smith 2020; Topdemir and Sarıtaş 2021). Acupressure has an important place within the scope of nurses' health care. Nurses can apply acupressure as part of their nursing care to reduce patients' pain and anxiety and increase patient comfort. As a whole, acupressure is a manual, non-invasive, non-costly and non-pharmacological healing intervention to improve the well-being of patients (Godley and Smith 2020; Rizi et al. 2017; Topdemir and Sarıtaş 2021). The role of acupressure has been very important in Chinese medicine for over 2000 years and the fact that it is still in use today is a testament to its effectiveness in treating disease and symptoms. At its core, acupressure is a method of signaling the body to turn on self-healing or regulatory mechanisms. Acupressure is a therapy method used to manage various symptoms. It is based on the belief that vital energy (Chi/Qi) in the body circulates along 12 main meridians. Approximately 365 points have been identified on these channels and each of these points affects the performance of a specific body part (Li et al. 2021; Mehta et al. 2016). Furthermore, acupressure is reported to reduce anxiety by regulating the concentration of neurotransmitters and reducing the concentration of 5-hydroxytryptamine and adrenocorticotropic hormone in neural pathways (Mehta et al. 2016). In addition to reducing anxiety, acupressure is also used to relax patients and relieve different types of pain treated with analgesics. In the literature, many randomized controlled trials, systematic reviews and meta-analysis studies have shown that acupressure reduces pain levels and provides relief (Godley and Smith 2020; Li et al. 2021; Mehta et al. 2016; Rizi et al. 2017). In the literature, it has been reported that acupressure is effective in reducing pain levels in patient groups such as cancer, post-op period, biopsy, laparoscopic intervention and hemodialysis (Godley and Smith 2020; Lee and Park 2019; Li et al. 2021; Mehta et al. 2016; Rizi et al. 2017; Topdemir and Saritas 2021). However, the number of studies on the effects of acupressure in the management of pain related to femoral catheter removal after CAG is quite limited. In this review, it is aimed to contribute to the determination of the efficacy of acupressure, which is an integrated treatment method for pain relief in individuals experiencing post-CAG pain.

PAIN IN PATIENTS UNDERGOING CORONARY ANGIOGRAPHY

Pain Definition, Physiology and Theories

The International Association for the Study of Pain (IASP) defines pain as an adverse sensory and emotional experience that accompanies actual or potential tissue damage, or both (IASP 2022). The best clinical statement is that "pain is what the patient says it is, and if the patient says it, it exists". In addition, pain is described as the "5th vital sign" and should be evaluated as important as the other four vital signs (Şenyüz and Koçaşlı 2017).

Pain stimuli are expressed by people as a subjective evaluation of physical symptoms and the way in which the subjective experience is evaluated differs depending on the individual. Although the way each individual evaluates pain is different, the fact that pain is a protective mechanism cannot be denied. With pain, individuals ensure that tissue damage is detected by reacting and investigating to eliminate this stimulus. This situation continues as the occurrence of pain, feeling pain, suffering pain, and behavior in response to the painful stimulus (Yağcı and Saygın 2019). Pain is a sensation that has receptors in the skin and some internal tissues that perceive it, such as touch or hearing, and is transmitted to the higher center in four steps. These are; feeling of pain (transduction), perception by receptors called nociceptors. Transmission of pain is the sending of the nerve impulse from the spinal cord to the brain. Pain regulation (modulation) is the regulation or modification of pain impulses. Perception of pain (perception) is the experience of pain by the individual (Yağcı and Saygın 2019).

Along with many assumptions put forward to define pain, the physiological mechanism has been explained by pain theories. Knowledge of these theories can bring different perspectives to nursing practices in the approach to the patient with pain.

Specificity Theory: René Descartes, one of the first western philosophers to describe a detailed bodily-sensory pathway in humans, defined pain as a perception that exists in the brain in 1644. He explained that pain caused by any stimulus is transmitted to the pain center in the brain by direct nerve conduction and thus pain occurs as a reflex event (Khan et al. 2015). Between 1894 and 1896, Max Von Frey explained that there were different somatosensory receptors with experiments that developed this theory. He suggested that nerve conduction is provided by these receptors that perceive hot, cold, touch and pain sensations on the skin (Trachsel and Cascella 2019).

Pattern Theory: According to this theory created by Goldscheider; it is stated that intense stimulation of any of the peripheral nerve fibers will cause the perception of pain. In other words, painful stimuli must accumulate above a certain threshold in the spinal cord for pain to be felt (Trachsel and Cascella 2019).

Gate Control Theory: Melzack and Wall (1965) examined the shortcomings of the two dominant theories of the period, specificity and pattern theories, and provided a model that could explain these seemingly contradictory phenomena. The gap between these theories was attempted to be bridged by a framework based on aspects of each theory supported by physiological data. According to the gate control theory, pain is controlled by the gate mechanism in the spinal cord before it reaches the brain (Eti Aslan 2020; Trachsel and Cascella 2019). This gating mechanism is provided by activation in thick and thin fibers. Thick fibers close the gate and pain does not reach the brain, while thin fibers open the gate and pain is felt. This theory has allowed health professionals to apply various pain prevention methods (Eti Aslan 2020; Khan et al. 2015).

Endorphin Theory: Endorphins are synthesized primarily by the pituitary gland in response to physiological stressors such as pain. Endorphins are proteins among brain chemicals known as neurotransmitters, which function to transmit electrical signals within the nervous system. These proteins function through various mechanisms in both the central and peripheral nervous system to relieve pain when they bind to opioid receptors. Stress and pain are the two most common factors that negatively affect endorphin release. With high endorphin levels, less pain is felt (Eti Aslan 2020; Khan et al. 2015). With this theory, research to increase endorphin levels in the body has gained momentum. In particular, it has been tried to provide pain control by increasing endorphin release with skin stimuli such as massage, acupressure and

transcutaneous electrical nerve stimulation (TENS) (Eti Aslan 2020; Khan et al. 2015).

Treatment and Management of Pain

The majority of patients experience pain during compression applied to the femoral region during femoral catheter removal after catheter insertion (Bayindir et al. 2017; Ghods et al. 2022; Heidaranlu et al. 2021). Ghods et al. (2022) found that patients experienced moderate pain (5.56±3.08) during femoral catheter removal (Ghods et al. 2022). It has been reported that if the pain experienced during femoral catheter extraction after CAG is not controlled, the ability of patients to cooperate during catheter removal is negatively affected, hemostasis time is prolonged, changes in vital signs may occur, and vasovagal reactions develop (Bayındır et al. 2017; Ghods et al. 2022; Heidaranlu et al. 2021). In addition, it is known that the pain experienced after CAG causes anxiety and psychological disorders. In a study examining the anxiety and related factors experienced by patients undergoing CAG, it was found that the most common source of anxiety experienced by patients after the procedure was due to pain and physical limitation at the intervention site. Therefore, it should be controlled by using pharmacologic and non-pharmacologic methods in pain management. Nonsteroidal anti-inflammatory drugs (NSAIDs), opioids, and adjuvant analgesics are used pharmacologically in pain management. Opioid analgesics are generally used for moderate to severe acute pain. Opioids exert their effect by binding to μu receptors in the central nervous system and intestines (Bluth and Pincus 2016; Paul et al. 2022). Non-pharmacological methods such as massage, music therapy, meditation, acupressure, acupuncture, hypnosis, hot-cold application can be used in pain management (İster and Altınbaş 2022; Vagharseyyedin et al. 2022). Pain management after coronary angiography is one of the important tasks of nurses. Uncontrolled pain may cause the development of complications by affecting hemodynamics. Achieving optimal effect in pain management requires a collaborative approach based on the cooperation of patients experiencing pain, their families and healthcare team members (Hinkle and Cheever 2018; Şenyüz and Koçaşlı 2017). The multidisciplinary healthcare team involved in treatment should meet on a common ground regarding analgesics and non-pharmacologic methods used to manage pain. Nurses play an important role in coordinating a comprehensive, evidence-based approach to meet the needs of individuals in all settings where they provide care (Hinkle and Cheever 2018).

Mechanism of Action of Acupressure and Pain Pathogenesis

Acupressure is an ancient massage technique using hands and fingers and stimulatory tools, formed by the combination of the words shi=finger and atsu=pressure. Acupressure is called a complementary and integrated form of treatment applied in the form of stimulation to certain points of the body in order to relieve various symptoms such as pain, fatigue, sleep problems and discomfort (Dincer et al. 2022; Schlaeger et al. 2017).

The points applied in acupressure, which has a long history, are the key points of the body and there is a special area corresponding to each symptom. These key points are called pressure points. The specified pressure points are the points on the body meridians that help manage pain and uncomfortable symptoms with stimulation (Dincer et al. 2022; Durmuş İskender and Eren 2020; Schlaeger et al. 2017).

According to acupressure philosophy, there are 14 imaginary meridian lines in the body, 12 double and 2 single, which are not anatomically located. These meridians are symmetrically distributed and located on both halves of the body. On the meridians; there are 365 points that provide energy flow. The life energy called "Qi" flows on these points and circulates in the organism 24 hours a day without interruption. This energy plays an active role as a determinant in all processes from birth to death (Durmuş İskender and Çalışkan 2020; Durmuş İskender and Eren 2020; Schlaeger et al. 2017).

Qi energy is shaped by two basic elements called "Ying and Yang". Ying and Yang work in opposition to each other, thus helping to establish balance in the organism. Ying is located in the anterior central canal part of the body, while Yang is located in the posterior canal. Ying meridians consist of the heart, kidney, liver, spleen, pancreas and lung, which are called secretory or storage organs. The main organs of Yang are the active organs such as the small and large intestine, stomach, bladder and gall bladder. The philosophy of acupressure is

based on maintaining the balance between Ying and Yang and ensuring the flow of energy between organs. When the flow of energy is not maintained for any reason, other unpleasant symptoms arise due to blockages in the meridians, which reduce the comfort level and quality of life of the organism. Acupressure is a complementary and integrated form of treatment that is painless, painless, economical, safe and without side effects. In addition, one of the advantages of the acupressure technique is that patients can practice acupressure on their own, as they can be taught how to do it. In this way, patients can apply acupressure to themselves whenever they are convenient, providing energy flow in the body and creating a healing power in the organism (Dincer et al. 2022; Durmuş İskender and Eren 2020; Schlaeger et al. 2017).

The relaxing effect of acupressure application can be explained according to the gate control mechanism and endorphin theory (Gönenç and Terzioglu 2020; Mehta et al. 2016). With the pressure applied to the acupressure points, the balance in the body is maintained by relieving oxygenation and blood flow in the area where blood flow and oxygenation are restricted. Stimuli generated as a result of pressure applied to acupressure points are transmitted to the brain four times faster than painful stimuli. According to the gate control theory, the application of pressure to the pressure points closes the nerve gates and prevents pain impulses from reaching the brain. The applied pressure activates the small myelin nerves in the muscles and the impulses are transmitted to the nerve centers via the spinal cord, midbrain (mesencephalon), hypothalamus and pituitary. Thus, the body's pain perception threshold is increased and painful stimuli reaching the cortex is reduced (Gönenç and Terzioglu 2020; Mehta et al. 2017). According to the endorphin theory, as a result of pressure application, endorphin and serotonin transmission to the brain and organs via nerves and meridians increases and a physiological response occurs. Acupressure applied to meridian points helps to reduce stress hormones and lactic acid concentration. In addition, acupressure activates myelinated neural fibers that stimulate the hypothalamus and pituitary gland, releasing b-endorphin from the hypothalamus to the cerebrospinal fluid and from the pituitary to the bloodstream, respectively. β-endorphin shows analgesic and sedative effects in individuals (Gönenç and Terzioglu 2020; Mehta et al. 2017). In addition, cortisol production, which is a stress response, occurs with the activation of the hypothalamic-pituitary-adrenocortical axis. Acupressure application is also an auxiliary application in lowering the cortisol level in the body (Mehta et al. 2017). Acupressure is also used to relieve different types of pain treated with analgesics. When we look at the literature, it is seen in many randomized controlled trials, systematic reviews and meta-analysis studies that acupressure application reduces the level of pain and thus provides relief (Li et al. 2021; Topdemir and Saritas 2021).

Literature Review on the Effect of Acupressure on Pain

In the Randomized Controlled Trial (RCT) conducted by Topdemir and Sarıtaş (2021) in which the effect of acupressure and reiki application on the pain and comfort level of the patient after laparoscopic cholecystectomy was examined, patients were divided into 3 groups as reiki (n:44), acupressure (n:44) and control (n:44) groups. Patients in the acupressure group were applied to GB 24, GB 34, GB 37, GB 42, LI 2, LI 4 and PC 6 points, and patients in the reiki group were applied to 7 chakra regions for a total of 28 minutes, and patients in the control group did not undergo any intervention. As a result of the study, it was found that the pain level decreased, comfort level increased and the difference between the groups was significant ($p<0.05$) in patients who received reiki and acupressure (Topdemir and Sarıtaş 2021). In the study by Li et al. (2021) titled Clinical efficacy and safety of acupressure in low back pain: a systematic review and meta-analysis, they investigated 23 RCTs published between 0-2020 that included the terms "acupressure" and "low back pain" and included 1200 patients with low back pain who met the inclusion criteria. According to the results of the study, it was determined that the decrease in pain scores was significantly significant in patients in the acupressure group compared to patients in the other group (manual-electro acupuncture, tuina massage, routine care) (Li et al. 2021). In a randomized controlled trial conducted by İster and Altınbaş (2022), the efficacy of acupressure on anxiety and pain was evaluated in patients undergoing CAG procedure. The intervention group received 11 minutes of acupressure on Hegu, Shenmen and

Yintang acupoints. After the intervention, it was found that the pain intensity of the acupressure group was less (İster and Altınbaş 2022). In a randomized controlled trial conducted by Vagharseyyedin et al. (2022) examining the effect of ear acupressure on back pain after CAG, the mean pain score in the group that received ear acupressure immediately and 20 minutes after the procedure was found to be lower than the control group (Vagharseyyedin et al. 2022). In the study by Monson et al. (2019) investigating the effect of acupressure on pain and anxiety scores, it was determined that there was a significant difference in the scores of the patients before and after acupressure, and the pain scores decreased significantly after the intervention (Monson et al. 2019). Rizi et al. (2017) examined the effect of acupressure on pain, anxiety and physiological indices in cancer patients undergoing bone marrow biopsy and found that pain scores decreased significantly in the acupressure group after the intervention compared to the sham and control group (Rizi et al. 2017). In the review conducted by Durmuş İskender and Eren (2020), in which theses made with acupressure application for pain were examined, it was found that acupressure was effective on pain (Durmuş İskender and Eren 2020). Similarly, İster and Karaca (2019) examined the nursing theses conducted by applying acupressure and found effective results on many symptoms including pain (İster and Karaca 2019). Hsu et al. (2022) measured the results of acupressure applied in thoracoscopic surgery with VAS and reported that it was effective in relieving postoperative pain (Hsu et al. 2022). Godley and Smith (2020) stated in their systematic review that acupressure is a feasible, effective, safe, low-cost, low-cost, non-pharmacologic method for reducing pain (Godley and Smith 2020). Narimani et al. (2018) described that acupressure on LI 4 points before the procedure was effective for pain relief in coronary artery surgery patients (Narimani et al. 2018).

Acupressure and Nursing in Pain Management of Patients Undergoing Coronary Angiography (CAG)

Patients undergoing coronary angiography (CAG) experience pain during the removal of the catheter placed in the femoral artery, which negatively affects the vital signs and comfort levels of patients (Bayındır et al. 2017; Lu and Chuang 2018). In addition, the pain experienced during removal of the femoral artery catheter or the pressure applied on the artery affects the vagus nerve. It is observed that the affected vagus nerve causes an intense parasympathetic stimulation and initiates a vasovagal reaction and syncope develops. Therefore, it has been reported that it is important to reduce the pain experienced by patients undergoing CAG (Xu and Huang 2021).

TBTs, which have been increasingly used in recent years, are used to support medical treatment. Since they are among the interventions that nurses can apply independently and constitute a new area of responsibility and research in nursing, the interest in TBTs is gradually increasing. Acupressure, which is included in the Classification of Nursing Interventions and approved by the American Holistic Nurses Association as a valid nursing intervention in patient care, is among the effective methods for holistic nursing care practices. These methods, on the one hand, provide nurses with an evidence-based and independent nursing practice, and on the other hand, improve the patient and nurse relationship (Durmuş İskender and Çalışkan 2020; Topdemir and Saritas 2021).

According to the results of meta-analysis, systematic review and randomized controlled trials with high level of evidence, it is stated that acupressure application, which is among TBTs, can be easily integrated into nursing care by nurses, has no side effects, and is an easy, economical and effective method. In the literature review, it was concluded that acupressure is an effective method in reducing pain level (Durmuş İskender and Eren 2020; Godley and Smith 2020; Hsu et al. 2022; İster and Altınbaş 2022; İster and Karaca 2019; Monson et al. 2019; Rizi et al. 2017; Narimani et al. 2018; Vagharseyyedin et al. 2022). Considering these results, more studies with high methodological quality should be conducted in order to include acupressure among nursing care practices, these practices, which are determined to be effective in symptom control, should be taught to nurses and patients should be taught to contribute to the management of their own symptoms.

CONCLUSION

It is known that acupressure applications have a positive effect on pain management and help to increase the general well-being and satisfaction of the patient. However, the number of studies on the effects of acupressure on pain

management in patients undergoing CAG is quite limited. Since acupressure, which is one of the non-pharmacological methods, has been widely used by patients in recent years, it is important that health professional nurses, who provide primary care and education to the patient, have knowledge about acupressure applications in order to increase its use and awareness in patient care, to inform about acupressure course certificate programs, to ignore side effects/allergy conditions, and to prevent unconscious use. In order for acupressure to be reflected in nursing care practices, it is thought that studies with high methodological quality are needed, research on the subject and contribution to the literature should be made. In addition, it is recommended to provide training on acupressure, which is one of the non-pharmacological methods in in-service trainings, to expand certificate programs for acupressure application, to increase awareness by sharing the results of studies on the effects of complications caused by drug treatment on economy, health and workload in the health care process and the advantages of using acupressure with health professionals.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

FINANCIAL DISCLOSURE

The authors received no financial support for this research.

REFERENCES

Bayındır, S. K., Çürük, G. N., ve Oguzhan, A. (2017). Effect of ice bag application to femoral region on pain in patients undergoing percutaneous coronary intervention. Pain Research and Management, 1-7. doi: 10.1155/2017/6594782

Dincer, B., İnangil, D., İnangil, G., Bahçecik, N., Ayaz, E.Y., Arslanoğlu, A., ... Özkan, G. (2022). The effect of acupressure on sleep quality of older people: A systematic review and meta-analysis of randomized controlled trials. Explore (NY), 18(6), 635-645. doi: 10.1016/j.explore.2021.11.010

Durmuş İskender, M., ve Eren, H. (2020). Türkiye'de ağrıya yönelik akupresur uygulaması ile ilgili yapılmış hemşirelik tezlerinin incelenmesi. Geleneksel ve Tamamlayıcı Tıp Dergisi, 3(1), 40-46. doi: 10.5336/jtracom.2020-73529

Durmuş İskender, M., ve Çalışkan, N. (2020). Konstipasyon yönetiminde akupresur uygulaması ve hemşirenin rolü. Van Tıp Derg, 27(1), 103-108. doi: 10.5505/vtd.2020.65002

Eti Aslan, F. (2020). Ağrı. A. Karadakovan, & F. Eti Aslan içinde, Dahili ve Cerrahi Hastalıklarda Bakım (Güncellenmiş 5. b., Cilt 1, s. 127-148). Ankara: Akademisyen Kitabevi.

Ghods, A. A., Roshani, A., Mirmohammadkhani, M., & Soleimani, M. (2022). Effects of valsalva maneuver on pain and vasovagal reaction during the removing of femoral arterial sheath after percutaneous coronary intervention: A randomized controlled trial. Journal of PeriAnesthesia Nursing, 37(6), 900-906. doi: 10.1016/j.jopan.2022.01.016.

Godley, E., & Smith, M.A. (2020). Efficacy of acupressure for chronic low back pain: a systematic review. Complementary Therapies in Clinical Practice, 39, 101146. doi: 10.1016/j.ctcp.2020.101146.

Gönenç, İ.M., ve Terzioğlu, F. (2020). Effects of massage and acupressure on relieving labor pain, reducing labor time, and increasing delivery satisfaction. J Nurs Res, 28(1), e68. doi: 10.1097/jnr.0000000000000344

Heidaranlu, E., Goyaghaj, N. S., Moradi, A., & Ebadi, A. (2021). The efficacy of an intervention program for pain intensity reduction in patients undergoing arterial sheath removal after coronary artery angioplasty. The Journal of Tehran University Heart Center, 16(3), 102-108. doi: 10.18502/jthc.v16i3.8186.

Hinkle JL, & Cheever KH. (2018). Brunner and Suddarth's textbook of medical-surgical nursing. 14 th ed. China: Wolters kluwer india Pvt Ltd, 225.

International Association of Study of Pain (IASP). Erişim adresi: https://www.iasp-pain.org/wpcontent/uploads/2022/04/revised-definition-flysheet_R2.pdf.

İster, E. D., ve Altınbaş, Y. (2022). The effect of acupressure on anxiety and pain among patients undergoing coronary angiography: A randomized controlled trial. Holistic Nursing Practice, 36(6), E57-E63. doi: 10.1097/HNP.0000000000000553

Jhand, A., Atti, V., Gwon, Y., Dhawan, R., Turagam, M. K., Mamas, M. A., ... Velagapudi, P. (2021). Metaanalysis of transradial vs transfemoral access for percutaneous coronary intervention in patients with ST elevation myocardial infarction. The American Journal of Cardiology, 141, 23-30. doi: 10.1016/j.amjcard.2020.11.016

Khan, M.A, Raza, F., Khan, I.A. (2015). Pain: History, culture and philosophy. AMHA-Acta medico-historica Adriatica, 13(1), 113-130.

Li, T., Li, X., Huang, F., Tian, Q., Fan, Z. Y., & Wu, S. (2021). Clinical efficacy and safety of acupressure on low back pain: A systematic review and meta-analysis. Evidence-Based Complementary and Alternative Medicine, 2021, 8862399. doi: 10.1155/2021/8862399

Lu, Y.Z., & Chuang, P.Y. (2018). Reducing the incidence of back pain in post-percutaneous coronary intervention patients with femoral sheath. Hu Li Za Zhi, 65(4), 94-101. doi: 10.6224/JN.201808_65(4).12

Mehta, P., Dhapte, V., Kadam, S., & Dhapte, V. (2016). Contemporary acupressure therapy: Adroit cure for painless recovery of therapeutic ailments. Journal of Traditional and Complementary Medicine, 7(2), 251-263. doi: 10.1016/j.jtcme.2016.06.004

Monson, E., Arney, D., Benham, B., Bird, R., Elias, E., Linden, K., & Waggy, D. (2019). Beyond pills: Acupressure impact on self-rated pain and anxiety scores. The Journal of Alternative and Complementary Medicine, 25(5), 517-521. doi: 10.1089/acm.2018.0422

Narimani, M., Ansari Jaberi, A., Negahban Bonabi, T., Sadeghi, T. (2018). Effect of acupressure on pain severity in patients undergoing coronary artery graft: A randomized controlled trial. Anesthesiology and Pain Medicine, 8(5). 82-92. doi: 10.5812/aapm.82920

Özyurtlu, F., Özdemir, İ. H., Çetin, N., ve Yavuz, V. (2022). Comparison of access site complications after early or late sheath removal in patients with PCI, regardless of ACT levels. Anatolian Journal of Cardiology, 26(8), 654-661. doi: 10.5152/AnatolJCardiol.2022.1733

Paul, A. K., Smith, C. M., Rahmatullah, M., Nissapatorn, V., Wilairatana, P., Spetea, M., ... Dietis, N. (2021). Opioid analgesia and opioid-induced adverse effects: A review. Pharmaceuticals, 14(11), 1091. doi:10.3390%2Fph14111091

Rizi, M.S., Shamsalinia, A., Ghaffari, F., Keyhanian, S., & Nabi, B.N. (2017). The effect of acupressure on pain, anxiety, and the physiological indexes of patients with cancer undergoing bone marrow biopsy. Complementary Therapies in Clinical Practice, 29, 136-141. doi: 10.1016/j.ctcp.2017.09.002

Schlaeger, J.M., Gabzdyl, E.M., Bussell, J.L., Takakura, N., Yajima, H., & Takayama, M. (2017). Acupuncture and acupressure in labor. J Midwifery Womens Health, 62, 12-28. doi: 10.1111/jmwh.12545

Şenyüz, K.Y., ve Koçaşlı, S. (2017). Cerrahi sonrası ağrıda multimodal analjezi ve hemşirelik yaklaşımı. Sağlık Akademisyenleri Dergisi, 4(2), 90-95. doi: 10.5455/sad.13-1491818424.

Topdemir, E. A., ve Saritas, S. (2021). The effect of Acupressure and Reiki application on Patient's pain and comfort level after laparoscopic cholecystectomy: A randomized controlled trial. Complementary Therapies in Clinical Practice, 43, 101385. doi: 10.1016/j.ctcp.2021.101385.

Trachsel, L.A., & Cascella, M. (2019). Pain Theory. Treasure Island (FL): StatPearls Publishing.

Vagharseyyedin, S. A., Kardan, M., Rahimi, H., BahramiTaghanaki, H., & Azdaki, N. (2022). The effects of ear acupressure on back pain after coronary angiography: A randomized controlled trial. Traditional and Integrative Medicine, 7(2), 180-186. doi: 10.18502/tim.v7i2.9917.

Virani, S. S., Alonso, A., Benjamin, E. J., Bittencourt, M. S., Callaway, C. W., Carson, A. P., ... Tsao, C.W. (2020). Heart disease and stroke statistics-2020 update: A report from the American Heart Association. Circulation, 141(9), e139-e596. doi: 10.1161/CIR.0000000000000757.

Xu, J.P., & Huang, J.Y. (2021). Nitrates and risk of vasovagal reaction in femoral sheath removal after percutaneous intervention: A retrospective observational study. Herz. 46(1), 130-134. doi: 10.1007/s00059-020-04916-0.

Yağcı, Ü., ve Saygın, M. (2019). Ağrı fizyopatolojisi. SDÜ Tıp Fakültesi Dergisi, 26(2), 209-220. doi: 10.17343/sdutfd.444237.