

DİYABETİK AYAK VE BAKIMI

İsmail TOYGAR

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ÖNSÖZ

Diyabet ülkemizde ve dünyada görülme sıklığı dramatik bir şekilde artmakta olan kronik bir hastalıktır. Diyabetik ayak ise tüm diyabetli bireylerin yaklaşık %15'ini etkileyen bir komplikasyondur. Diyabetik ayak yönetimi birçok meslek branşını içeren ekip tarafından gerçekleştirilmektedir. Hemşirelik mesleği ise bu ekibin içerisinde önemli bir yere sahiptir. Bu kitap hemşireler ve hemşirelik öğrencileri için diyabetik ayak ve yönetimini ele almaktadır.

Bu kitapta diyabetik ayağın başlangıcından, amputasyona giden süreçte farklı aşamalarındaki yönetimi yer almaktadır. Bu kitabın yazımı da dâhil akademik yaşantımda desteğini her zaman hissettiğim başta doktora tez danışmanım sayın Prof. Dr. Aynur TÜREYEN olmak üzere, tüm Ege Üniversitesi Hemşirelik Fakültesi İç Hastalıları Hemşireliği Anabilim Dalı'na teşekkürü borç bilirim.

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KAYNAKLAR

1. American Diabetes Association. Diagnosis and Classification of Diabetes Mellitus. *Diabetes Care*, 2010;33(1):62–69.
2. World Health Organization. Global report on diabetes. World Health Organization. 2016, Erişim Tarihi: 30.07.2018, Erişim: <http://www.who.int/iris/handle/10665/204871>.
3. Satman I, Yilmaz T, Sengül A, Salman S, Salman F, Uygur S, et al. Population-based study of diabetes and risk characteristics in Turkey: results of the turkish diabetes epidemiology study (TUR-DEP). *Diabetes Care*, 2002;25(9):1551-1556.
4. Satman I, Omer B, Tutuncu Y, Kalaca S, Gedik S, Dinccag N, et al. Twelve-year trends in the prevalence and risk factors of diabetes and prediabetes in Turkish adults. *European journal of epidemiology*, 2013;28(2):169-180.
5. Rubeaan K, Al Derwish M, Ouizi S, Youssef AM, Subhani SN, Ibrahim HM, et al. Diabetic foot complications and their risk factors from a large retrospective cohort study. *PLoS One*, 2015;10(5):e0124446.
6. Elhadd TA, Al-Amoudi AA, Alzahrani AS. Epidemiology, clinical and complications profile of diabetes in Saudi Arabia: a review. *Annals of Saudi medicine*, 2007;27(4):241.
7. Abbott CA, Carrington AL, Ashe H, Bath S, Every LC, Griffiths J, et al. The North-West Diabetes Foot Care Study: incidence of, and risk factors for, new diabetic foot ulceration in a community-based patient cohort. *Diabetic medicine*, 2002;19(5):377-384.
8. Nather A, Bee CS, Huak CY, Chew JL, Lin CB, Neo S, et al. Epidemiology of diabetic foot problems and predictive factors for limb loss. *Journal of Diabetes and its Complications*, 2008;22(2):77-82.
9. Armstrong DG, Boulton AJ, Bus SA. Diabetic foot ulcers and their recurrence. *New England Journal of Medicine*, 2017;376(24):2367-2375.
10. Costa RHR, de Loiola Cisneros L, Luz AR. Diabetic Foot. In *Vascular Diseases for the Non-Specialist*, Springer International Publishing, 2017:151-165.
11. Elraiyyah T, Prutsky G, Domecq JP, Tsapas A, Nabhan M, Frykberg RG, et al. A systematic review and meta-analysis of off-loading methods for diabetic foot ulcers. *Journal of vascular surgery*, 2016;63(2):59-68.

12. Martins-Mendes D, Monteiro-Soares M, Boyko EJ, Ribeiro M, Barata P, Lima J, et al. The independent contribution of diabetic foot ulcer on lower extremity amputation and mortality risk. *Journal of Diabetes and its Complications*, 2016;28(5):632-638.
13. Driver VR, Fabbi M, Lavery LA, Gibbons G. The costs of diabetic foot: the economic case for the limb salvage team. *Journal of vascular surgery*, 2010;52(3):17-22.
14. Lavery LA, Peters EJ, Armstrong DG. What are the most effective interventions in preventing diabetic foot ulcers?. *International wound journal*, 2018;5(3):425-433.
15. Lavery LA, Peters EJ, Williams JR, Murdoch DP, Hudson A, Lavery DC. Reevaluating the way we classify the diabetic foot: restructuring the diabetic foot risk classification system of the International Working Group on the Diabetic Foot. *Diabetes care*, 2008;31(1):154-156.
16. Cavanagh PR, Bus SA. Off-loading the diabetic foot for ulcer prevention and healing. *Journal of Vascular Surgery*, 2010;52(3):37-43.
17. Scimeca CL, Bharara M, Fisher TK, Kimbriel H, Mills JL, Armstrong, DG. An update on pharmacological interventions for diabetic foot ulcers. *Foot & ankle specialist*, 2010;3(5):285-302.
18. Moulik PK, Mtonga R, Gill GV. Amputation and mortality in new-onset diabetic foot ulcers stratified by etiology. *Diabetes care*, 2003;26(2):491-494.
19. Boulton AJ, Vileikyte L, Ragnarson-Tennvall G, Apelqvist J. The global burden of diabetic foot disease. *The Lancet*, 2005;366(9498):1719-1724.
20. Kerr M, Rayman G, Jeffcoate WJ. Cost of diabetic foot disease to the National Health Service in England. *Diabetic Medicine*, 2014;31(12):1498-1504.
21. Keskek SO, Kirim S, Yanmaz N. Estimated costs of the treatment of diabetic foot ulcers in a tertiary hospital in Turkey. *Pakistan journal of medical sciences*, 2014;30(5):968.
22. Pscherer S, Dippel FW, Lauterbach S, Kostev K. Amputation rate and risk factors in type 2 patients with diabetic foot syndrome under real-life conditions in Germany. *Primary care diabetes*, 2012;6(3):241-246.
23. Akçay S, Satoğlu İS, Harman E, Kurtulmuş A, Kazımoğlu C. Diyabetik ayak ülserli hastalarda amputasyon oranı ve eşlik eden komorbiditelerin retrospektif analizi. *Medicine Science*, 2012;1(4):331-340.

24. Zammitt NN, Frier BM. Hypoglycemia in type 2 diabetes: pathophysiology, frequency, and effects of different treatment modalities. *Diabetes care*, 2005;28(12):2948-2961.
25. Cryer P. Hypoglycemia in diabetes: pathophysiology, prevalence, and prevention. American Diabetes Association, 3rd edition, 2016, ISBN: 9781580406499.
26. TEMD Diyabetes Mellitus Çalışma ve Eğitim Grubu, TEMD Diyabetes Mellitus ve Komplikasyonlarının Tanı, Tedavi ve İzlem Kılavuzu-2018, Mayıs 2018, Ankara, ISBN: 9786054011322.
27. Kitabchi AE, Umpierrez GE, Miles JM, Fisher JN. Hyperglycemic crises in adult patients with diabetes. *Diabetes care*, 2009;32(7):1335-1343.
28. Van der Does FE, De Neeling JND, Snoek FJ, Kostense PJ, Grootenhuys PA, Bouter LM. et al. Symptoms and well-being in relation to glycemic control in type II diabetes. *Diabetes care*, 1996;19(3):204-210.
29. Sarwar N, Gao P, Seshasai SR, Gobin R, Kaptoge S, Di Angelantonio et al. Diabetes mellitus, fasting blood glucose concentration, and risk of vascular disease: a collaborative meta-analysis of 102 prospective studies. *Emerging Risk Factors Collaboration. Lancet*. 2010; 26;375:2215-2222.
30. International Diabetes Federation. IDF Diabetes Atlas, 8th edn. Brussels, Belgium: International Diabetes Federation, 2017. Erişim Tarihi: 30.07.2018, Erişim: <http://www.diabetesatlas.org>.
31. International Diabetes Federation. IDF Country Report, Turkey, Erişim Tarihi: 30.07.2018, Erişim: <https://reports.instantatlas.com/report/view/704ee0e6475b4af885051bcec15f0e2c/TUR>.
32. American Diabetes Association. 2. Classification and diagnosis of diabetes: standards of medical care in diabetes—2018. *Diabetes Care*, 2018;41(1):13-27.
33. World Health Organization. Definition, diagnosis and classification of diabetes mellitus and its complications: report of a WHO consultation. Part 1, Diagnosis and classification of diabetes mellitus, Geneva: World health organization, 1999;(No. WHO/NCD/NCS/99.2).
34. Atkinson MA, Eisenbarth GS, Michels AW. Type 1 diabetes. *The Lancet*, 2014;383(9911):69-82.
35. Daneman D. Type 1 diabetes. *The Lancet*, 2006;367(9513):847-858.
36. Vijan S. Type 2 diabetes. *Annals of internal medicine*, 2010;152(5):ITC3-1.

37. Chatterjee S, Khunti K, Davies MJ. Type 2 diabetes. *The Lancet*, 2017;389(10085):2239-2251.
38. Kim C, Newton KM, Knopp RH. Gestational diabetes and the incidence of type 2 diabetes: a systematic review. *Diabetes care*, 2002;25(10):1862-1868.
39. Carpenter MW, Coustan DR. Criteria for screening tests for gestational diabetes. *American Journal of Obstetrics & Gynecology*, 1982;144(7):768-773.
40. Bellamy L, Casas JP, Hingorani AD, Williams D. Type 2 diabetes mellitus after gestational diabetes: a systematic review and meta-analysis. *The Lancet*, 2009;373(9677):1773-1779.
41. Eppens MC, Craig ME, Cusumano J, Hing S, Chan AK, Howard NJ, et al. Prevalence of diabetes complications in adolescents with type 2 compared with type 1 diabetes. *Diabetes care*, 2006;29(6):1300-1306.
42. Porte D, Schwartz MW. Diabetes Complications--Why Is Glucose Potentially Toxic?. *Science*, 1996;272(5262):699-699.
43. Orban JC, Van Obberghen E, Ichai C. Acute Complications of Diabetes. In *Metabolic Disorders and Critically Ill Patients*, Springer, 2018:341-363.
44. Kurt M, Atmaca A, Gürlek A. Diyabetik nefropati. *Hacettepe Tıp Dergisi* 2004; 35: 12-17.
45. Yararcan M. Diyabetik Retinopatide Sistemik ve Genetik Risk Faktörleri Ders Notları. İstanbul, 1998:240-247.
46. Chiasson JL, Aris-Jilwan N, Bélanger R, Bertrand S, Beauregard H, Ékoé JM, et al. Diagnosis and treatment of diabetic ketoacidosis and the hyperglycemic hyperosmolar state. *Canadian Medical Association Journal*, 2003;168(7):859-866.
47. Wolfsdorf J, Glaser N, Sperling MA. Diabetic ketoacidosis in infants, children, and adolescents: a consensus statement from the American Diabetes Association. *Diabetes care*, 2006;29(5):1150-1159.
48. Chiasson JL, Aris-Jilwan N, Bélanger R, Bertrand S, Beauregard H, Ékoé JM, et al. Diagnosis and treatment of diabetic ketoacidosis and the hyperglycemic hyperosmolar state. *Canadian Medical Association Journal*, 2003;168(7):859-866.
49. Stoner GD. Hyperosmolar hyperglycemic state. *Am Fam Physician*, 2005;71(9):1723-30.
50. Nugent BW. Hyperosmolar hyperglycemic state. *Emergency medicine clinics of North America*, 2005;23(3):629-48.

51. Stoner GD. Hyperosmolar Hyperglycemic State. American family physician, 2017;96(11).
52. Pasquel FJ, Umpierrez GE. Hyperosmolar hyperglycemic state: a historic review of the clinical presentation, diagnosis, and treatment. Diabetes Care, 2014;37(11):3124-3131.
53. Tentolouris N, Katsilambros N. Lactic Acidosis in Diabetes. Diabetic Emergencies: Diagnosis and clinical management, 2011:133-147.
54. English P, Williams G. Hyperglycaemic crises and lactic acidosis in diabetes mellitus. Postgraduate medical journal, 2004;80(943):253-261.
55. Cryer PE, Davis SN, Shamon H. Hypoglycemia in diabetes. Diabetes care, 2003;26(6):1902-1912.
56. Cryer PE, Arbeláez AM. Hypoglycemia in diabetes. Textbook of Diabetes, 2017:513-533.
57. Cryer PE. Glycemic goals in diabetes: trade-off between glycemic control and iatrogenic hypoglycemia. Diabetes, 2014;63(7):2188-2195.
58. Fowler MJ. Microvascular and macrovascular complications of diabetes. Clinical diabetes, 2008;26(2):77-82.
59. Tervaert TWC, Mooyaart AL, Amann K, Cohen AH, Cook HT, Drachenberg C, et al. Pathologic classification of diabetic nephropathy. Journal of the American Society of Nephrology, 2010;ASN-2010010010.
60. Molitch ME, Defronzo RA, Franz MJ, Keane WF. Nephropathy in diabetes. Diabetes care, 2007;27(1):79-83.
61. Gross JL, De Azevedo MJ, Silveiro SP, Canani LH, Caramori ML, Zelmanovitz, T. Diabetic nephropathy: diagnosis, prevention, and treatment. Diabetes care, 2005;28(1):164-176.
62. Fong DS, Aiello L, Gardner TW, King GL, Blankenship G, Cavallerano JD, et al. Retinopathy in diabetes. Diabetes care, 2004;27(suppl 1):s84-s87.
63. Ateş O, Kiki I, Bilen H, Keleş M, Kocer I, Kulaçoğlu DN, et al. Association of mean platelet volume with the degree of retinopathy in patients with diabetes mellitus. Eur J Gen Med, 2009;6(2):99-102.
64. Russell JW, Berent-Spillon A, Vincent AM, Freimann CL, Sullivan KA, Feldman EL. Oxidative injury and neuropathy in diabetes and impaired glucose tolerance. Neurobiology of disease, 2008;30(3):420-429.

65. Feldman EL. Oxidative stress and diabetic neuropathy: a new understanding of an old problem. *The Journal of clinical investigation*, 2003;111(4):431-433.
66. Işık C, Sarman H, Şahin AA, Kargı E, Sarman Z, Erkuran MK. Diabetes mellitus and peripheral organs involvement: Current treatment options. *Journal of Clinical and Experimental Investigations*, 2014;5(2):329-335.
67. Baktıroğlu, S. Diyabetik ayak infeksiyonları: Genel bilgiler ve cerrahi tedavi. *ANKEM Dergisi*, 2012;26(2):204-211.
68. Kanatlı U. Diyabetik ayak enfeksiyonları. *Türk Ortopedi ve Travmatoloji Birliği Derneği Dergisi*, 2011;10(4):296-305.
69. Aumiller WD, Dollahite HA. Pathogenesis and management of diabetic foot ulcers. *American Academy of Physician Assistants*, 2015;28(5):28-34.
70. Shukla V, Mani, R. Emerging trends in diabetic foot ulcer management in India. *The International Journal of Lower Extremity Wounds*, 2015;9(3):111-112.
71. Yerat RC, Rangasamy VR. A clinicomicrobial study of diabetic foot ulcer infections in South India. *International Journal of Medicine and Public Health*, 2015;5(3):236- 237.
72. Falanga V. Wound healing and its impairment in the diabetic foot. *The Lancet*, 2005;366(9498):1736-1743.
73. Bowering CK. Diabetic foot ulcers. Pathophysiology, assessment, and therapy. *Canadian Family Physician*, 2001;47(5):1007-1016.
74. Alavi A, Sibbald RG, Mayer D, Goodman L, Botros M, Armstrong DG, et al. Diabetic foot ulcers: Part I. Pathophysiology and prevention. *Journal of the American Academy of Dermatology*, 2014;70(1):1-e1.
75. Lavery LA, Armstrong DG, Wunderlich RP, Mohler MJ, Wendel CS, Lipsky BA. Risk factors for foot infections in individuals with diabetes. *Diabetes care*, 2006;29(6):1288-1293.
76. Oyibo SO, Jude EB, Tarawneh I, Nguyen HC, Harkless LB, Boulton AJ. A comparison of two diabetic foot ulcer classification systems: the Wagner and the University of Texas wound classification systems. *Diabetes care*, 2001;24(1):84-88.
77. Schaper NC. Diabetic foot ulcer classification system for research purposes: a progress report on criteria for including patients in research studies. *Diabetes/Metabolism Research and Reviews*, 2004;20(S1):90-95.
78. Weck M, Slesacek T, Paetzold H, Muench D, Nanning T, Von Gern G, et al. Structured health care for subjects with diabetic foot

- ulcers results in a reduction of major amputation rates. *Cardiovascular diabetology*, 2013;12(1):45.
79. Schaper NC. Diabetic foot ulcer classification system for research purposes: a progress report on criteria for including patients in research studies. *Diabetes/Metabolism Research and Reviews*, 2004;20(S1):S90-S95.
 80. Frykberg RG, Zgonis T, Armstrong DG, Driver VR, Giurini JM, Kravitz SR, et al. Diabetic foot disorders: a clinical practice guideline (2006 revision). *The journal of foot and ankle surgery*, 2006;45(5), S1-S66.
 81. Armstrong DG, Lavery LA, Harkless LB. Validation of a diabetic wound classification system: the contribution of depth, infection, and ischemia to risk of amputation. *Diabetes care*, 1998;21(5):855-859.
 82. Fard AS, Esmaelzadeh M, Larijani B. Assessment and treatment of diabetic foot ulcer. *International journal of clinical practice*, 2007;61(11):1931-1938.
 83. Bowering CK. Diabetic foot ulcers. Pathophysiology, assessment, and therapy. *Canadian Family Physician*, 2001;47(5):1007-1016.
 84. Boulton A, Armstrong D, Albert S, Frykberg R, Hellman R, Kirkman M, et al. Comprehensive foot examination and risk assessment. *Endocrine Practice*, 2008;14(5):576-583.
 85. Desalu OO, Salawu FK, Jimoh AK, Adekoya AO, Busari OA, Olokoba AB. Diabetic foot care: self reported knowledge and practice among patients attending three tertiary hospital in Nigeria. *Ghana medical journal*, 2011;45(2):60-65.
 86. American Diabetes Association. Standards of medical care in diabetes—2015 abridged for primary care providers. *Clinical diabetes: a publication of the American Diabetes Association*, 2015;33(2):97.
 87. Baranoski S, Ayello EA. *Wound care essentials: Practice principles*. Lippincott Williams & Wilkins, 2008, ISBN: 1469889137.
 88. Janis JE, Attinger CE. The basic science of wound healing. *Plastic and reconstructive surgery*, 2006;117(7 Suppl):12-34.
 89. Barrientos S, Stojadinovic O, Golinko MS, Brem H, Tomic-Canic M. Growth factors and cytokines in wound healing. *Wound repair and regeneration*, 2008;16(5):585-601.
 90. Diegelmann RF, Evans MC. Wound healing: an overview of acute, fibrotic and delayed healing. *Front Biosci*, 2004;9(1):283-289.
 91. Guo SA, DiPietro LA. Factors affecting wound healing. *Journal of dental research*, 2010;89(3):219-229.

92. Ekmekçi P, Bostancı S. Yara İyileşmesi. Türkiye Klinikleri Journal of Dermatology, 2002;12(2):114-120.
93. Özkorkmaz EG, Yusuf Ö. Yara İyileşmesi Ve Yara İyileşmesinde Kullanılan Bazı Bitkiler. Türk Bilimsel Derlemeler Dergisi, 2009;(2):63-67.
94. Aksoy H, Bingöl Özakpınar Ö. Yara iyileşmesi ve oksidatif stres.
95. Falanga, V. (2005). Wound healing and its impairment in the diabetic foot. The Lancet, 2014;366(9498):1736-1743.
96. Brem H, Tomic-Canic M. Cellular and molecular basis of wound healing in diabetes. The Journal of clinical investigation, 2007;117(5):1219-1222.
97. Guo SA, DiPietro LA. Factors affecting wound healing. Journal of dental research, 2010;89(3):219-229.
98. Navarro JF, Mora C. Diabetes, inflammation, proinflammatory cytokines, and diabetic nephropathy. The Scientific World Journal, 2006;6, 908-917.
99. Hehenberger K, Hansson A, Heilborn JD, Abdel-Halim SM, Östensson CG, Brismar K. Impaired proliferation and increased L-lactate production of dermal fibroblasts in the GK-rat, a spontaneous model of non-insulin dependent diabetes mellitus. Wound Repair and Regeneration, 1999;7(1):65-71.
100. Gabbiani G. The myofibroblast in wound healing and fibrocontractive diseases. The Journal of Pathology: A Journal of the Pathological Society of Great Britain and Ireland, 2003;200(4):500-503.
101. Greenhalgh DG. Wound healing and diabetes mellitus. Clinics in plastic surgery, 2003;30(1):37-45.
102. Süntar IP, Akkol EK, Yilmazer D, Baykal T, Kırmızıbekmez H, Alper M, et al. Investigations on the in vivo wound healing potential of Hypericum perforatum L. Journal of ethnopharmacology, 2010;127(2):468-477.
103. Çapoğlu İ, Yenidünya MO, Ünüvar N. Diyabetik ayağın Değerlendirilmesi. Atatürk Üniversitesi Tıp Fakültesi Dergisi 2001;33:39-42.
104. Game FL, Apelqvist J, Attinger C, Hartemann A, Hinchliffe RJ et al. International Working Group on the Diabetic Foot (IWGDF). IWGDF guidance on use of interventions to enhance the healing of chronic ulcers of the foot in diabetes. Diabetes/metabolism research and reviews, 2016;32:75-83.
105. Tatsioni A, Balk E, O'Donnell T, Lau J. Usual care in the management of chronic wounds: A review of the recent literature. Journal of the American College of Surgeons, 2007;205(4):617-624.

106. Dumville JC, Deshpande S, O'Meara S, Speak K. Hydrocolloid dressings for healing diabetic foot ulcers. Cochrane Database of Systematic Reviews 2013, Issue 8. Art. No.: CD009099. Hydrocolloid dressings for healing diabetic foot ulcers. Cochrane Database of Systematic Reviews 2013, Issue 8. Art. No.: CD009099. DOI: DOI: 10.1002/14651858.CD009099.pub3.
107. Lam, G., Fontaine, R., Ross, F. L., & Chiu, E. S. (2017). Hyperbaric oxygen therapy: exploring the clinical evidence. *Advances in skin & wound care*, 30(4), 181-190.
108. Zhao, D., Luo, S., Xu, W., Hu, J., Lin, S., & Wang, N. (2017). Efficacy and safety of hyperbaric oxygen therapy used in patients with diabetic foot: a meta-analysis of randomized clinical trials. *Clinical therapeutics*, 39(10), 2088-2094.
109. Kranke, P., Bennett, M. H., James, M. S., Schnabel, A., Debus, S. E., & Weibel, S. (2015). Hyperbaric oxygen therapy for chronic wounds. Cochrane Database of Systematic Reviews, 6.
110. Özkayın, N., Erdem, M., & Tiftikcioğlu, Y. Ö. (2017). Negatif basınçlı yara tedavisi ve ortopedi pratiğinde kullanımı. *TOTBİD Derg*, 16(3), 203-8.
111. Samancıoğlu S, Esen A, Ercan G, Mansoub NH, Vatansever S, İnce İ. A new dressing material in diabetic wounds: Wound healing activity of oleuropein-rich olive leaf extract in diabetic rats. *Gaziantep Med J*, 2016;22(1), 14-21.
112. Gökçe S. (Danışman: Türeyen A.) Diyabetik ayak için deneysel bir çalışma: diyabetik sıçanlarda hypericum perforatum- klinoptilolit-hidrokolloid örtünün yara iyileşmesine etkisi. Ege Üniversitesi Sağlık Bilimleri Enstitüsü İç Hastalıkları Hemşireliği Anabilim Dalı. Doktora Tezi. İzmir, 2015.
113. Ersoy S. (Danışman: Türeyen A.) Diyabetik Ayak Bakımında İn Vivo Çalışma: Gülyağından Elde Edilen Geraniol Pansumanının Diyabetik Yara İyileşmesine Etkisi. Ege Üniversitesi Sağlık Bilimleri Enstitüsü İç Hastalıkları Hemşireliği Anabilim Dalı. Doktora Tezi. İzmir, 2017.
114. Toygar İ. (Danışman: Türeyen A.) Deneysel Diyabet Modelinde Allicinin Yara İyileşmesine Etkisi. Ege Üniversitesi Sağlık Bilimleri Enstitüsü İç Hastalıkları Hemşireliği Anabilim Dalı. Doktora Tezi. İzmir, 2018.
115. Karadakovan A, Eti Aslan F. Dahili Cerrahi Hastalıklarda Bakım, Akademi Kitabevi, 2018.

116. Kır Bıçer E., Olgun N. Diyabetik Ayak Ülserlerinden Korunma ve Yara Bakımı. Hemflirelikte Eğitim ve Araştırma Dergisi 2007; 4 (1): 28-31
117. Yüksel A. Diyabette Ayak Bakımı içinde Diyabet Hemşireliği Derneği, Diyabet Hemşireliği Derneği Kitabı. SS: 127-140. Erişim Adresi: http://www.tdhd.org/dhd_kitab.php
118. Türsen, Ü. (2013). Ülser Tedavisinde Yara Örtüleri/Wound Dressing in Ulcer Treatment. Turk Dermatoloji Dergisi, 7(2), 61.