5.2 Wound care education from a podiatry perspective

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Abstract

Podiatrists have a key role in the diagnosis and treatment of wounds in the lower limb or feet, particularly among patients with diabetes, rheumatic conditions, and complications due to cancer treatment. The wound care is an essential part of patient-centered care especially in a multidisciplinary environment. Podiatry education provides a variety of competencies that are needed in wound care. A comprehensive understanding of wound etiology, healing process and care options are needed to identify, care and monitor (follow-up) wounds. The podiatry competences in biomechanics and offloading significantly contribute to the healing process. Podiatrists are educated to relief and distribute pressure in the wound area by making insoles, orthoses, and footwear modifications. In podiatry education, a multidisciplinary approach to wound care is highlighted and that is realized through collaborative learning and on-site learning with different health care professionals during clinical placements. Sustainability in wound care is emphasized in podiatry education to decrease the waste related to wound care and the overall care process. This article defines podiatry and describes the main wound care areas in podiatry. Then wound care competence areas are described with some curriculum-related examples. Finally, methods of teaching wound care in podiatry are provided and discussed in the light of multidisciplinary approach and green podiatry. Along these topics future research points are highlighted.

Keywords: collaborative learning, foot, lower limb, off-loading, podiatry, podiatry education, sustainability, wound care

Introduction

Podiatrists have a central role in the diagnosis and treatment of wounds in the lower limb or feet. The important combination of biomechanical, off-loading, and wound care competences is essential in the treatment of these wounds as often pressure is one of the underlying mechanisms that

impairs wound healing (Bus, 2023). Podiatrists are skilled to identify, care and monitor (follow-up) wounds. They are educated to relief and distribute pressure in the wound area by making felt paddings, insoles, orthoses, and footwear modifications. And therefore, can offer a broad range of therapeutic interventions to improve wound healing or prevent ulceration or re-ulceration (TRIEPodD–UK , 2012; Saxion University of Applied Sciences, 2022).

Over the years the focus changed from treatment of wounds towards prevention of ulceration. It started with the use of the risk stratification system for the prevention of diabetic foot disease. It is commonly used by podiatrists as they have a leading role in the prevention of diabetic foot ulceration (Bus, 2023; Federatie Medisch Specialisten, 2021; Zorgmodule preventie diabetische voet ulcera, 2019). From that point on the basic principles, knowledge and experience gained in the field of diabetic foot disease are transferred towards the care for patients with other wound etiology (Korda & Bálint, 2004; Lacouture, et al., 2018). Podiatrists are trained to diagnose and classify feet at risk for ulceration, are capable of recognize signs of pre-ulceration and adapting treatment options based on a patient centered care principle. Research indicates that engagement of patients in the choice for therapeutic shoes for plantar pressure reduction enhances adherence (Liang, 2012; Tan, Horobin, & Tunprasert, 2019; Kielo, Suhonen, Salminen, & Stolt, 2019). Besides therapeutic interventions for the reduction of plantar pressure, podiatrists also provide skin care and debridement of callus in feet in high risk of ulceration (Bus, 2023).

The ability that one person can offer to provide preventative treatment, wound care and biomechanical offloading highlights the importance of a podiatrist as member or leading clinician in a multidisciplinary wound care team.

Wound care competence in podiatry

The global definition of the podiatry is formulated by the International Federation of Podiatrists (FIP) as: “a profession of health sciences concerned with research, prevention, diagnosis and treatment of deformities, pathologies, and injuries of the foot and associated structures – in relation with the body as well as the manifestations of systemic diseases – by

all appropriate systems and technologies using scientific and professional specialized knowledge ((FIP), 2023).” This definition is used as a guideline for the curricula and the competences in podiatry education. However, the educational degree differs from country to country. Therefore, the scope of the profession and the place within the healthcare system can be different.

Podiatry education provides a variety of competencies that are needed in wound care. A comprehensive understanding of wound etiology, healing process and care options are needed to identify, care, and monitor (follow-up) wounds. The podiatry competences in biomechanics and offloading significantly contribute to the healing process. Podiatrists are educated to relief and distribute pressure in the wound area by making felt paddings, insoles, orthoses, and footwear modifications (TRIEPodD–UK , 2012; Saxion University of Applied Sciences, 2022). Although the competences in biomechanics, offloading and wound care are leading within this area of expertise, the other competences in the curricula support and add important basic knowledge, skills, and professional attitude (Saxion University of Applied Sciences, 2022). For example, motivational interviewing is part of podiatrists' communication competence. Motivational interviewing is applicable in patient education during ~~a~~ the wound consultation but can also be widely used for positive communication and behavioral change in general.

The majority of the bachelor's and master's degrees have wound care, biomechanics and offloading principles in their curricula. At other lower educational levels these competences are not combined, or the podiatrist is not allowed to provide wound care in their home country due to restrictions in their healthcare system. In this case the podiatrist is involved in only a part of the wound care process.

The role of the bachelor and master-level trained podiatrist in a multidisciplinary team is often a leading position or coordinating role in the care of the patient with ulceration. Podiatrists are trained to diagnose the cause of ulceration or impaired healing. Depending on this outcome, podiatrists either monitor the healing process or refer the patient to physician for further consultation. Management of the wound, including sharp wound debridement, choice of wound dressing, design or creating an

offloading device and enhancing therapeutic adherence are part of the competences. A smaller group of podiatrists is also trained in prescription of medicine and is allowed to prescribe without supervision of a physician (TRIEPodD–UK , 2012; Federatie Medisch Specialisten, 2021; Zorgmodule preventie diabetische voet ulcera, 2019).

Podiatrist do not only treat patients with impaired wound healing at the lower limb due to diabetes mellitus but also a variety of underlying conditions that affect wound healing. For example, the podiatrist also provides wound care or preventative treatment for patients with peripheral arterial disease, neurological disorders, and rheumatic condition. Furthermore, podiatrist takes also part to cancer treatment-related ulcer care (Korda & Bálint, 2004; Lacouture, et al., 2018). In several countries health care professionals acknowledge these skills of the podiatrist. Podiatrists are successfully included in the multidisciplinary teams or labeled as leading clinicians. This led to changes in guidelines and also caused financial contribution by insurance companies for preventative patient programs (Federatie Medisch Specialisten, 2021; Zorgmodule preventie diabetische voet ulcera, 2019). Patients profit from this patient-centered approach. The benefits of a podiatrist and the expected reduction of cost while preventing ulceration seems to be a logical consequence. However, to be able to reach out to policymakers and insurance companies research is needed to establish the reduction of cost and the importance of podiatry services for every patient with a wound.

As a result of the shift from wound care toward preventative treatment, the focus within the podiatry competences slightly changed. The unique situation that a podiatrist provides the care for the patients from preventative treatment and monitoring towards wound care if needed, supports the idea patient-centered care. The relationship between the patient and the podiatrist evolves during the regular consultations. Therefore, it becomes easier to relate to personal beliefs and recognize barriers to wound care treatment and adherence. Patient-centered care is an important part when it comes to preventative treatment and adherence (Moore, 2014). The use of motivational interviewing in these consultations needs to be further explored in research, as well as the barriers to wound care or preventative treatment (Keukenkamp, Merkx, Busch-Westbroek, & Bus, 2018).

Patient education is a very important competence area for a podiatrist. For example, in patients with diabetes, education about lifestyle and encouragement of even small lifestyle changes have a positive effect on glucose levels and reduces the risk of long-term complications. Studies on education and adherence to offloading devices have shown clearly that therapeutic patient education promotes adherence to footwear and early identification of foot ulceration (Liang, 2012; Coppola, 2023). Therefore, patient education is a basic skill for podiatrists.

Educational methods to support the development of wound care competence in podiatry

For podiatrist in wound care competences are essential. It requires the application of knowledge, skills and professional attitude in combination with a multidisciplinary approach and thereby the consideration of different perspectives on wound healing. An effective learning strategy to develop these competences is blended learning. In comparison to traditional learning, it combines face-to-face learning with e-learning and demonstrates consistently better effects on knowledge outcomes (Kang & Kim, 2021; Vallée, Blacher, Cariou, & Sorbets, 2022; Rowe, Frantz, & Bozalek, 2012). Single interventions studies show in nursing show that it even has a positive effect on problem-solving ability and self-directed learning (Kang & Kim, 2021).

A second method to improve these skills is interdisciplinary learning. In podiatry education, a multidisciplinary approach to wound care is highlighted and that is realized through collaborative learning and on-site learning with different health care professional during clinical placements. Collaborative learning is promoted within an interdisciplinary student-led clinic. It facilitates a broader perspective on healthcare, gains knowledge about practical roles and referral pathways of other disciplines and enhances the development of inter-professional communications skills (Hopkins, Bacon, & Flynn, 2021; Kent F, 2014). During clinical placement these skills can be further optimized and applied in a working environment. Important skills that are essential in the preparation for working in a multidisciplinary wound care setting, for example in a high-risk diabetic foot clinic.

Thirdly, especially in wound care, simulation-based education is useful for training debridement of callus from the skin or wound edge. This method provides a safe learning environment, improves the skills of debridement and enhances the self-confidence of the student and prepares them for their work in university clinic or clinical placement (Grollo, Morphet, & Shields, 2018; Banwell, Causby, Crozier, Nettle, & Murray, 2021). To evaluate students wound care competence in podiatry, validated instruments are rare. However, C/WoundComp instrument was developed and tested among nursing and podiatry students providing one possible instrument to measure wound care competence (Kielo-Viljamaa, et al., 2021). The use of this kind of assessment instrument could develop the research of wound care competences in podiatry which has been rather limited (Kielo E. S., 2018).

Wound care in for patients with diabetic foot disease in podiatry curriculum – An example from Finland and the Netherlands

In the podiatry curriculum the wound care education is embedded in the courses of diabetes. For example, in Finland, across the Nordic countries and in the Netherlands the podiatry degree includes several modules related of diabetes. Although the subjects of the modules are similar, due to differences in university education models, timing of the modules during the course differ. This is a consequence of the variation in educational models used at the various universities. Therefore, the amount of European Credit Transfer and Accumulation System (ECTS) corresponding with the module also changes. Educational methods such as blended, interdisciplinary and simulation-based learning are used within these modules to enhance the development of wound care competences.

These modules start with a theoretical module focusing on high-risk foot disorders and foot ulcer management and treatment. Following this module, the students are able to explain the basic functions of metabolism, digestion, hormonal functions and also understands their significance in the function of the organ system (Saxion University of Applied Sciences, 2022; Metropolia University of Applied Sciences, 2023). The students will also be able to describe the aetiology, symptoms, treatment principles and mechanism of diabetes, main rheumatological diseases and lower extremity vascular disorders, and the mechanism of lower extremity

problems caused by long-term health problems. In addition, the students will be aware of the national treatment and prevention programs as well as recommendations related to these previously mentioned health problems. At the end of this theoretical module the students will need to pass a written exam to proceed with the course (Saxion University of Applied Sciences, 2022; Metropolia University of Applied Sciences, 2023).

After they have passed the theoretical module, the students will begin to learn the clinical examinations related to diabetes and vascular disorders related to lower extremities. Students will not only be able to perform the examinations related to these disorders but will also be able to interpret the results of the examinations. These examinations include specific tests for the at-risk foot like motor neuropathy tests, autonomic neuropathy, sensory neuropathy (for example monofilament test & vibration test) and vascular test (like ankle brachial index test etc.) After learning these examinations, the students will then need to pass a practical exam (Saxion University of Applied Sciences, 2022; Metropolia University of Applied Sciences, 2023).

Following previously described module, the student has obtained knowledge of the current practices in wound care and is able to classify, document, and assess the wounds being treated. The students are able to describe the causes as well as healing and treatment principles of different types of wounds. The students will be able to utilizes evidence-based information in wound care and understands the significance of multi-professional collaboration in the comprehensive care process of a patient with a wound. The student will also gain competence to become a specialist for lower extremity wound care in different workgroups and networks. They are also able to educate the client, or the people close to the client in wound care prevention. The students specifically manage the different aspects of foot wounds and the treatment principles (Saxion University of Applied Sciences, 2022; Metropolia University of Applied Sciences, 2023).

After completing the previous module, a student continues to module of podiatric orthotic therapy or offloading. As a learning outcome of this module the student is able to describe the indicators for therapeutic footwear, know the manufacturing process and is able to instruct a client in

the use of therapeutic footwear. The student will understand the acquisition process of medical orthotic devices. They also know the preparation methods, casting techniques and indicators of usage for the orthosis. The student will be able to choose different preparation methods and is prepared to use different techniques for orthosis in a client-oriented manner. On practical level, the student will also be able to design, prepare, and assess pressure relieving and pressure equalizing orthosis utilizing different preparation methods (Saxion University of Applied Sciences, 2022; Metropolia University of Applied Sciences, 2023).

The module of podiatric orthotic therapy or offloading promotes students' competency in the assessment of the need for custom orthosis or therapeutic footwear. They are able to assess the impact of the orthosis, footwear or pressure relieving applications on lower extremity biomechanics whilst also able to use different kinds of offloading and gather feedback on their functionality with the use of digital systems. The students have knowledge and skills to apply orthotic therapy as a part of client's overall podiatric therapy. Once the students have passed all these modules, they are able to go to clinical practice to continue their studies and apply developed competences (Saxion University of Applied Sciences, 2022; Metropolia University of Applied Sciences, 2023).

Sustainability in wound care

Wound care requires application of care products and equipment. However, relatively little attention has been paid to sustainability in wound care. Overuse of wound care products may lead to increased health care emissions and thus contribute the climate change. Worldwide health care climate footprint is estimated to be almost 5 % of global net emission. Health care is a significant contributor to the climate crisis, and it is necessary to take responsibility for our climate footprint (Health Care's Climate Footprint., sd). Therefore, it is very important to focus on sustainability already in education to increase the awareness of the ethical responsibility of future professionals and healthcare organizations (Macpherson, Hill, & 1, 2017).

The majority of health care emissions are from energy and resource consumption and the import of greenhouse gases into the environment (Health Care's Climate Footprint., sd). When creating suitable health care

system, it is important to decrease serious health problems, like wounds. Thus, one of the major topics are reduce consumption of health services by preventing these issues. This target could be achieved if sustainable development runs through the curriculum and the modules. It is important to raise low consumptions methods as a keen competence. Very suitable treatment choices in wound care are patient education and ulcer prevention.

In podiatry education, being aware of our high carbon footprint is an important aspect that needs to be considered, especially working in wound care because of the frequent use of materials such as dressings and materials for offloading. To decrease medical waste, it is important to educate professionals and patients to work with those materials in a sustainable way. In addition, in education recycling of materials during lessons should be encouraged. Lecturers need to take this into account when designing the concept of the lesson or practical workshop. Therefore, sustainability in wound care is emphasized in podiatry to decrease the waste related to wound care treatment and the overall care process. In addition, recycling of materials during lessons should be encouraged.

Conclusions

Podiatrists' competence in wound care includes knowledge, skills, and performance in anatomy and physiology, diagnosis in wound etiology, biomechanics, off-loading, footwear therapy, callus and ulcer debridement, and patient education. In podiatry education multiprofessional collaboration is highlighted already during the studies, for example in clinical placement. Leading to enhanced competences in collaborative multidisciplinary work. Wound care management is a multiprofessional approach where podiatrists have all the competences to play a in central role in the prevention and management of ulceration at the lower limb.

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