

Health economic considerations to effectively implement telemonitoring of diabetic foot ulcer

Ruben Willems

Department of Public Health and Primary Care, Interuniversity Center for Health Economic Research (i-Cher), Ghent University, C. Heymanslaan 10, 4K3 – Entrance 42, 9000, Ghent, Belgium

Global diabetes prevalence is estimated at 537 million people of which 45% are undiagnosed. Another 541 and 319 million people are presumed having impaired glucose tolerance and impaired fasting glucose levels, respectively,¹ and are at increased risk to progress to Type 2 Diabetes Mellitus.²

There are a number of diabetes-related health problems such as retinopathy, heart disease, nephropathy, and diabetic foot ulcer (DFU). The latter is an open sore or wound on the foot, often as a result from badly healed small injuries, which regularly causes complications such as infection and amputation, or even death.³ Meta-analysis demonstrated a global DFU prevalence of 6.3% among persons with diabetes. These people are in general older, have a lower body mass index, a longer diabetic disease history, suffer more from comorbidities such as hypertension and retinopathy, and are more often smokers.⁴ One fifth to one third of persons with diabetes will one day suffer from it.³

Diabetes imposes a substantial burden on healthcare budgets with 11.5% of global health expenditures spent on diabetes.¹ One third of diabetes-related expenditures relates to DFUs, and hospitalization is the most important direct cost driver.⁵ In *The Lancet Regional Health—Europe*, Dardari et al.⁶ therefore investigated the impact of the French TELEPIED trial on hospitalization days and related costs in 180 patients with diabetic foot ulcer or a recurrence of a previously healed ulcer (1:1 randomization to intervention and control group). TELEPIED compares telemedicine management by an expert nurse and diabetologist with a standard care procedure of outpatient follow-up visits. Each patient received daily home care of a community nurse but the intervention group was asked to send a picture of their DFU to the hospital-based expert nurse for evaluation on a weekly basis.⁶

The intervention group stayed almost half as many days in the hospital compared to the control group –7.1 days versus 13.4 days at 12 months— with a likewise impact on direct costs.⁶ Importantly, the authors did not collect data on hospitalization days and direct costs prior to the intervention period so cautiousness is advised when interpreting the results: healthcare resource use

could already have been lower in the intervention group. However, patients were randomized to an intervention arm and baseline characteristics did not differ, strengthening the hypothesis that the TELEPIED trial indeed lowered hospitalization costs.

Thus, telemonitoring might enhance follow-up care of DFU. One important and even crucial issue to successfully scale-up interventions such as TELEPIED is a fair remuneration strategy. Telemonitoring (and more widely, telemedicine) is already in use in daily practice but appropriate payment is falling behind in many countries.⁷ Countries providing remuneration for telemedicine often compensates via a fee-for-service system which comes with several challenges such as (i) possible supplier-induced overconsumption, (ii) the need to specify each and every medical act apart which leads to situations where not all telemedicine services are covered, (iii) complex regulations about when and whether telemedicine is more appropriate than a physical encounter, and (iv) difficult discussions whether telemedicine should be remunerated equivalent to in-person consultations. Capitation-based or hybrid payment systems appear to struggle less with these issues.⁷ Indeed, recent research showed that physicians point to alternative payment schemes than fee-for-service as one of the minimum required modalities to successfully implement telemonitoring.⁸ Moreover, they called for a fair remuneration of all healthcare professionals involved,⁸ which is of particular interest when keeping the central role of nurses in the TELEPIED trial in mind.⁶ Different healthcare professionals perform individual tasks and collaborate when needed: pay-for-coordination might be an option to integrate in a remuneration strategy.⁸ Remuneration of telemonitoring should also be adapted to whether the follow-up is sporadic or more continuous,⁸ with the latter, and thus DFU telemonitoring, requesting a more episodic payment (i.e., a fixed amount of money for a given time period).

Finally, apart from how to pay for telemonitoring, a few words on how to conduct a health economic evaluation of telemonitoring seems rightful. Dardari et al.⁶ focused on hospitalization costs but Raghav et al.⁹ argued that the economic burden should be examined more carefully. Several cost components should ideally be taken into account including primary care and the social impact on patients.⁹ It is not always easy to monetarize every single component and economic evaluations can differ widely in which components they



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E-mail address: Ruben.willems@ugent.be.

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have included, making it sometimes challenging to compare studies. It is therefore recommended to state the perspective taken and to transparently report on the costing. Generally speaking, every health economic evaluation should adhere to the Consolidated Health Economic Evaluation Reporting Standards 2022 (CHEERS 2022) statement.¹⁰ Only then it is possible to assess the value of a health economic study.

Contributors

Ruben Willems: conceptualisation, writing—original draft.

Declaration of interests

None to declare.

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