The quality of drug prescription for elderly patients in medical wards. A randomized controlled study to evaluate the effects of an e-learning educational program in elderly patients hospitalized in Internal Medicine and Geriatric wards.

G. Gussoni[1], C. Franchi[2], P.M. Mannucci[3], R. Bernabei[4], S. Bonassi[5], G. Onder[4], A. Valerio[1], D. Manfellotto[6], A. Nobili[2] on behalf of the ELICADHE Investigators

[1]FADOI Clinical Research Dept., Milan,
[2]Lab. for Quality Assessment of Geriatric Therapies and Services, Dept. of Neuroscience,IRCCS - Istituto di Ricerche Farmacologiche 'Mario Negri', Milan
[3]Hemophilia and Thrombosis Center, IRCCS Ca' Granda Maggiore Hospital Foundation, Milan
[4]Dept. of Geriatrics, Policlinico A. Gemelli, Catholic University of the Sacred Heart, Rome
[5]IRCCS - San Raffaele Pisana, Rome
[6]Dept. of Internal Medicine, Ospedale Fatebenefratelli-AFaR, Isola Tiberina, Rome

Objectives: Elderly people are usually frail and more susceptible to adverse drug reactions owing to changes in pharmacokinetics and pharmacodynamics. Polypharmacy has been associated with increased occurrence of adverse drug reactions and negative clinical outcomes, and increased risks of morbidity, mortality and multiple hospital admissions, namely in elderly people. Although many adverse drug reactions are unpredictable, others can be foreseen and prevented, such as those due to well established drug-drug interactions. Aim of this study, promoted by four Italian Scientific Societies (FADOI, SIMI, SIGG and SIGOs) and with the coordination of the 'Mario Negri' Research Institute, was to evaluate whether a web-based teaching was able to improve the quality of drug prescription in elderly patients hospitalized in Internal Medicine and Geriatric wards.
Methods: In this randomized, controlled study, 20 Internal Medicine and Geriatric Units were randomized to intervention (e-learning educational program) or control (basic geriatric pharmacology notions). The program delivered to clinicians of the wards randomized to intervention included notions of Comprehensive Geriatric Assessment and geriatric pharmacology, together with training for the use of a third generation assessment instrument. Logistic regression analysis was used in order to assess the effect of the intervention on the use of potentially inappropriate medication (primary outcome) at hospital discharge, and according to Beers criteria. Secondary outcomes were the prevalence of at least one potential drug-drug interactions, and potentially severe drug-drug interactions at discharge. Mortality rate and incidence of re-hospitalizations were also assessed at 12-month follow-up.
Results: A total of 697 patients (347 in the intervention and 350 in the control group) aged 75 or more were enrolled, being 7 the median number of drugs at baseline in both arms. There were no statistically significant difference in socio-demographic variables and risk factors. No statistically significant difference in the prevalence of potentially inappropriate medication at discharge was found comparing intervention and control arms (OR 1.29, 95%CI 0.87-1.91) as well as no significant decrease in the prevalence of drug-drug interactions (OR 0.67, 95%CI 0.34-1.28) and potentially severe drug-drug interactions (OR 0.86, 95%CI 0.63-1.15 - Intention-to-treat analysis). No differences between groups were also observed at 12-month follow-up for mortality and re-hospitalization (21.4% vs 20.4%, and 40.2% vs 36.7%, respectively).
Conclusions: In this study, an e-learning educational program had no clear effect on the quality of drug prescription and clinical outcomes in elderly patients hospitalized in internal medicine and geriatrics wards. A possible explanation for poor efficacy of this intervention is the low level of interactivity of the e-platform we used; our approach was a mix between passive and interactive learner systems, because static texts and pictures were delivered together with self-assessment exercises with feedback, including multiple-choice questions on a case-report simulating a prescription scenario. In addition, in our study, 42% of older people were discharged from the enrolled wards with at least one potentially inappropriate medication , 88% with at least one potential drug-drug interactions and 56% with at least one potentially severe drug-drug interactions . Finally only very few adverse drug reactions were reported, suggesting under-recognition of these important events. For these reasons more aggressive educational programs or other approaches should be evaluated in order to improve clinicians' prescription in the hospitalized elderly people (Study supported by the Italian Drug Agency).
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