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Improving medication administration skills of patients

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Medication administration is error-prone. Particularly in primary care, where the patient is entrusted with this task, correct administration especially depends on the patient's knowledge and skills. While causes and error prevention strategies in the inpatient setting are well researched, nature and etiology of administration errors and according prevention strategies in primary care have been rarely investigated. Considering lack of knowledge as the principal cause of administration errors, patient education seems most promising to improve medication administration skills of patients. Comprehensive knowledge of error risks in the administration process of individual dosage forms, consideration of individual causes, and provision of comprehensible information were considered as key elements of effective patient education. Therefore, first a systematic literature review was conducted on administration errors with therapeutic systems applied as a transdermal patch revealing that errors occur at every step in the administration process and often due to lacking knowledge (Project I). Subsequently, focus group discussions with patients, family caregivers, and nurses investigated individually perceived causes of administration errors (Project II). In these discussions, the open question, whether having any problem with medication administration, demonstrated that the included patients were considerably unaware of potential pitfalls in the administration process. In addition, patients principally believed that the medicinal product was causing difficulties rather than scrutinizing their own administration skills. As a first measure to provide these patients with low-threshold access to information on correct medication administration, patient leaflets were developed and tested for comprehensibility (Project III). The leaflets contained information on the swallowing of capsules, splitting of tablets, correct administration of eye drops, transdermal patch use, dosing of oral liquids with a measuring device or a dropper, and correct reconstitution and administration of dry syrups. First, readability was determined with a readability formula and suitability for patient education was assessed by systematic analysis of critical aspects of high quality written material. The desk-based assessments were amended by pilot-testing of the leaflets in 45 patients that validated a comprehensible and attractive presentation of information. Subsequently, the leaflets were integrated into two educational interventions during drug prescribing in the outpatient pain clinic of Heidelberg University Hospital (Project IV) and during drug dispensing in community pharmacies (Project V). Both interventions included an assessment of individual knowledge and skills by asking targeted questions about published transdermal patch administration errors (Project IV) or observation of patients during administration of eye drops, oral solutions with a dropper, oral liquids with a measuring device, or transdermal patches (Project V). In the outpatient setting, a clinical pharmacist who provided education on correct transdermal patch administration including written patient information improved knowledge of patients comparably to delivering the leaflets during routine patient-physician consultation (Project IV). In the community pharmacy, comprehensive patient education included assessments of administration skills, provision of tailored counseling and delivery of patient leaflets followed by evaluation of teaching success (teach-back). The educational intervention sustainably improved eye drops administration skills. While at baseline 6 % of the patients administered their eye drops correctly,

significantly more patients administered their eye drops correctly after one month (35 %) and after six months (67 %) (Project V).

In conclusion, a prerequisite to patient-centered interventions that aim at improving medication administration is the thorough analysis of individual causes. This could be assessed by observing the patient during medication administration or asking targeted questions about published administration problems rather than open generated questions. Both educational interventions reduced knowledge-based medication administration errors. Because patients frequently reported that the medicinal product influences the correct administration of drugs, health care professionals should address product characteristics known to complicate administration while prescribing and dispensing drugs.