Kepler Universitätsklinikum

4CPS-100

VALIDITY, RELIABILITY AND USER-PRACTICABILITY OF A CLASSIFICATION TOOL FOR DRUG-RELATED PROBLEMS AND PHARMACIST INTERVENTIONS WITHIN AN UPPER AUSTRIAN HOSPITAL TRUST

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BACKGROUND AND IMPORTANCE

In order to fully capture the contribution of clinical pharmacists to pharmacotherapy, a standardized and validated classification tool for drug-related problems (DRP) and pharmacist interventions (PI) is essential. Therefore, "DokuTool" has been developed by an Upper Austrian hospital trust following the expansion of its clinical pharmacy services.

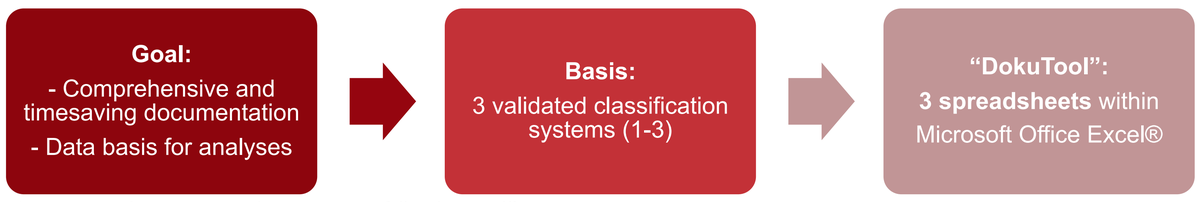

Fig. 1: *Development and structure of "DokuTool"*

"DokuTool" comprises **four main categories** and **39 subcategories** with fixed choices for **DRPs and PIs**. In addition, organisational and patient data is included (Tab. 1). Timekeeping and patient counts per day are documented in a separate spreadsheet.

Tab. 1: *Categories and samples within one Microsoft Office Excel® spreadsheet of "DokuTool"*

Category	Number of features	Example
Organisational (Date, Department, Clinical pharmacy service)	-	15.02.2023, Orthopaedic Surgery, Admission process
Patient data (gender, age)	2	m/f; age in numbers
Case description (Free text)	-	
Drugs involved	-	2 columns: Entry of up to 2 drugs (active substance)
Type of DRP	6	No/insufficient effect of treatment
Cause of DRP	16	Incorrect dosage; Interaction (avoid combination)
Planned PI	11	Instructions for use changed
Acceptance of PI	6	Intervention accepted and implemented
Red Flag	-	Optional to mark high risk DRPs

AIM AND OBJECTIVES

- To assess the reliability, validity and user-practicability of the Austrian classification system for DRPs and PIs, "DokuTool".
- To give recommendations for an updated version and to provide the Austrian hospital pharmacists with a validated, uniform system.

MATERIALS AND METHODS

A literature review identified 10 similar instruments. Based on the analysis of their validation process, the methodology of the project was developed.

Reliability and Validity

Clinical hospital pharmacists (n=29) classified 24 sample cases, adapted from Ganso et al., with "DokuTool" (4). Inter-rater reliability was determined by internal and external participants using the Fleiss' kappa statistic. Internal pharmacists reassessed ten of the previous cases and test-retest reliability was assessed by Cohen's Kappa.

Validity was determined by correlating the individual ratings of the 24 sample cases with a majority vote of five experts (= "gold standard") using contingency coefficient.

Usability

Acceptability, feasibility and user-practicability were assessed by an online survey (nine questions) with a 5-point Likert scale (1=strongly agree; 5=strongly disagree) and an open comment section for suggestions for improvement.

RESULTS

- 29 clinical pharmacist participated (13 internal, 11 external and five experts)
- Professional experience in clinical pharmacy: "1-5 years" (median)

Reliability

"DokuTool" achieved a **moderate inter-rater reliability** (Fig. 2) in the two main categories "Type of DRP" (κ = 0.528 [95 % confidence interval (CI): 0.514 – 0.541]) and "Cause of DRP" (κ = 0.594 [95 % CI: 0.587 – 0.601]). The category "Planned PI" showed **substantial** agreement with κ = 0.638 [95 % CI: 0.629 – 0.647]. Results were interpreted according to Landis and Koch (5).

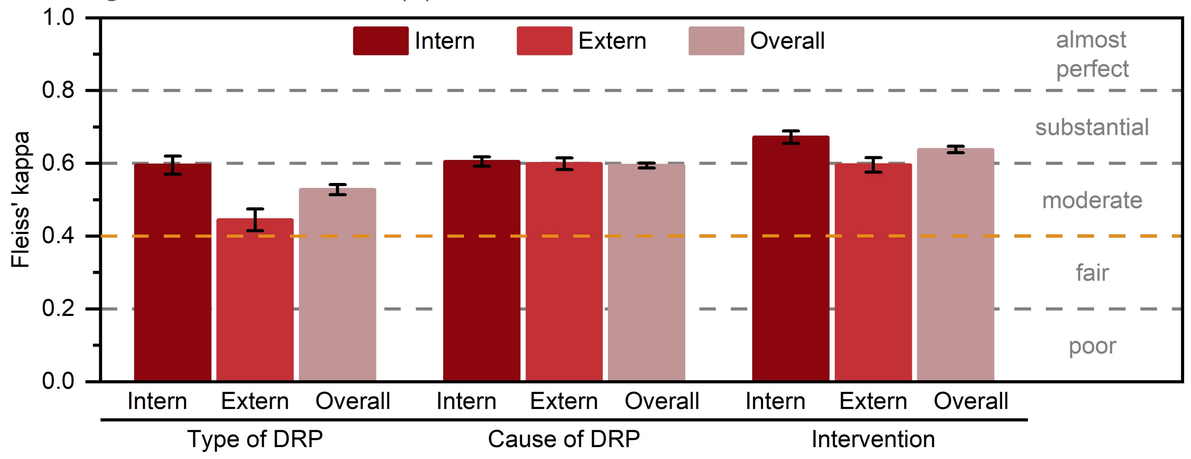

Fig. 2: *Inter-rater reliability using Fleiss' kappa coefficients for the three main categories (orange line: κ>0.4; minimum requirement of a clinical classification tool)*

Test-retest reliability achieved **substantial to almost perfect** agreement for all three main categories: "Type of DRP" (κ = 0.825 [95 % CI: 0.734 – 0.915]), "Cause of DRP" (κ = 0.896 [95 % CI: 0.825 – 0.967]) and "Planned PI" (κ = 0.891 [95 % CI: 0.819 – 0.964]).

Validity

The median rater-specific contingency coefficient for the three main categories was 0.84 [range: 0.75 – 0.89], 0.95 [0.94 – 0.96] and 0.93 [0.91 – 0.94], indicating a **strong correlation** between gold standard and raters.

Usability

Users (n=28) rated "DokuTool" as comprehensive (median: 2 [interquartile range: 1.75]) and user-friendly (2 [1]) but the completeness of the categories was rated neutral to negative (3 [2]) (Fig. 3). The time required was considered reasonable (3 [1]).

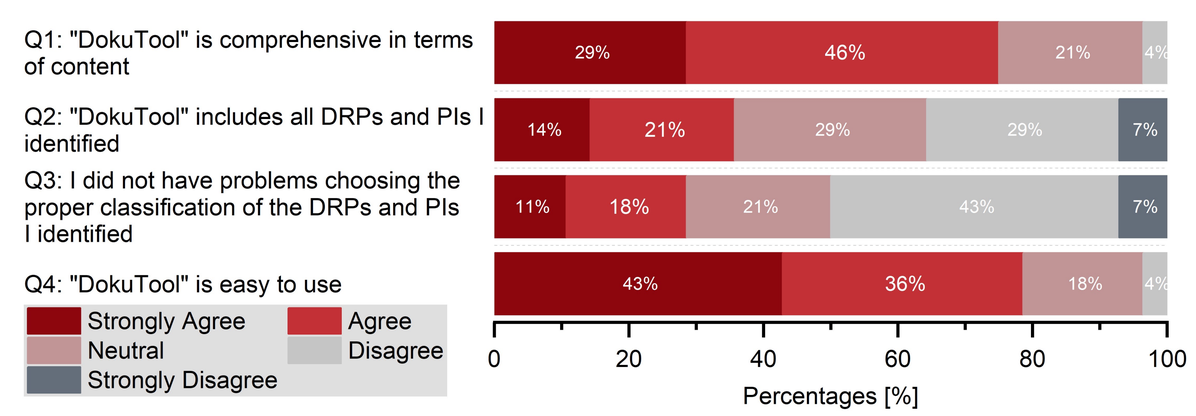

Fig. 3: *Excerpt from the usability survey (four questions and results)*

In addition, the quantitative content analysis of the commentary section revealed unclear categories and a need for structural optimisation such as:

- **User manual** → improvement in consistency; mandatory for nationwide use
- **Columns for involved drugs** → facilitates evaluation; shortens documentation time

CONCLUSION AND RELEVANCE

"DokuTool" has proven to be reliable and valid. Pharmaceutical interventions can be documented easily, reproducibly and in a time-saving manner. The use of a validated system contributes to efficient information transfer, performance documentation as well as to quality assurance. Therefore, a template as well as an user manual will be made available to Austrian hospital pharmacists.

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