

# Comprehensibility of a standardized medication plan

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## Introduction and Aim

- A standardized, national **medication plan** (MP) for patients has been implemented in Germany by law as part of the German Action Plan for Medication Safety issued by the Federal Ministry of Health.
- The MP depicts all medicines taken (Rx and OTC) including active ingredient, brand name, strength, form, dosage, unit, instructions for use, and indication.

- However, patients' understanding of this MP has never been explored.

The purpose of this study was

- to evaluate the comprehensibility of the national MP by general internal medicine (**GIM**) and patients with chronic heart failure (**CHF**) who took at least 5 medicines.

## Methods

We conducted 90 structured face-to-face interviews to analyze patients' comprehensibility of the standardized MP template [Figure 1].

- N=50 patients with CHF; recruited and interviewed in the hospital (Saarland University Medical Center).
- N=40 GIM patients; recruited and interviewed in 7 community pharmacies [Table 1].

Active ingredient	Brand name	Strength	Form	Unit	Instructions	Indication
Magnesium oxide	Magnesium-Diasporal® 150	250mg	Caps	0 0 1	Pcs	Cramps
Metoprolol succinate	Metoprololsuccinat - 1A (Pharma®)	95mg	Tabl	½ 0 0	Pcs	Heart failure
Omeprazole	Antra MUPS® 20mg	20mg	Tabl	1 0 1	Pcs	Heart burn
Methotrexate	MTX HEXAL® 10mg	10mg	Tabl	once a week Monday	Pcs	At night with a glass of water Joint inflammation
Metamizole (dipyrone)	Novaminsulfon 500 mg Lichtheim	500mg/ml	Drops	30 30 0 30	Drops	Pain
Combination product	Baldigarant® zur Beruhigung		Tabl	1 1 1 1	Pcs	Restlessness

Figure 1. Mock-up MP; unauthorized English translation (dummy data; does neither represent a real patient's medication nor clinical guidelines).

## Interviews

- A mock-up MP [Figure 1] listing 6 example drugs was handed out.
- Additionally, patients got the six medication packages filled with placebos.
- Patients were asked to fill the pill boxes, according to the MP for 2 days.
- The filled pill boxes were photographed for documentation purposes.
- For CHF patients, we also tested for signs of depression (PHQ-9), level of self-care (EHFScB-9), and cognitive impairment (Mini-Cog).

## Evaluation

### Evaluation Tool to test the handling of the Medication Plan (ET-MP)<sup>1</sup>

- To objectively evaluate the filled pill boxes.
- Rates patients' medication management skills. Score ranges from 0-100%.
- Cut-off for patients' comprehension set at 90%.

## Results

### Filled pill boxes / ET-MP<sup>1</sup> score [Figures 2A and 2B]

The mean ( $\pm$  SD) ET-MP scores

- for the CHF cohort:  $78 \pm 23\%$   
38% achieved a score >90% (understood the MP)
- for the GIM cohort:  $86 \pm 19\%$  (p=0.16)  
50% achieved a score >90% (p=0.29)



Figure 2A. Patient A: correctly filled pill boxes for 2 days. Figure 2B. Patient B: incorrectly filled pill boxes.  
 Note: morgens=morning; mittags=noon; abends=evening; nachts=night/at bedtime

## Variables

- We found a moderate correlation between the ET-MP score and the level of **education** ( $r=0.45$ ;  $p<0.002$ ) and
- a moderate correlation between the ET-MP score and **age** ( $r=-0.46$ ;  $p<0.002$ ).
- Cognitively impaired** CHF patients ( $n=23$ , 46%) achieved a lower score ( $69 \pm 25$  vs.  $85 \pm 18\%$ ,  $p=0.03$ ).
- CHF patients in a worse disease state (**NYHA III/IV**) scored lower ( $64 \pm 21\%$ ) than patients in NYHA class I/II ( $82 \pm 22\%$ ,  $p=0.006$ ).
- In the CHF cohort, signs of depression (PHQ-9  $\geq 10$ : 26%), a reduced LVEF (<40%) or a lower level of self-care behaviour (EHFScB-9 sum score <median) were not associated with a lower score.

Table 1. Descriptive characteristics of the study groups; mean  $\pm$  SD or n (%).

Characteristic	GIM (N=40)	CHF (N=50)	All (N=90)	p value
Age (years)	69 $\pm$ 13	69 $\pm$ 14	69 $\pm$ 13	0.85
Female	22 (55)	20 (40)	42 (47)	0.16
Highest completed education				
none	4 (10)	5 (10)	9 (10)	
8/9 years	12 (30)	30 (60)	42 (47)	
10 years	8 (20)	9 (18)	17 (19)	0.004
12/13 years	4 (10)	4 (8)	8 (9)	
college/university	12 (30)	2 (4)	14 (16)	
Living situation: alone	14 (35)	16 (32)	30 (33)	0.76
Number of drugs <sup>a</sup>	8 $\pm$ 3	8 $\pm$ 3	8 $\pm$ 3	0.63
Possession of a medication list <sup>a,b</sup>	30 (75)	41 (86)	71 (79)	0.42
Usage of a pill box <sup>a</sup>	29 (73)	40 (80)	69 (77)	0.40
Diabetes	13 (33) <sup>a</sup>	17 (34)	30 (33)	0.62
NYHA class				
I/II		39 (78)		
III/IV		11 (22)		
LVEF <40%		11 (22)		
eGFR <60 ml/min		39 (78)		

<sup>a</sup>According to the patient; <sup>b</sup>partly self-made and outdated.  
 eGFR=estimated glomerular filtration rate; LVEF=left ventricular ejection fraction.

## Discussion and Conclusions

- The ET-MP is suitable to quantitate patients' comprehensibility of the MP.
  - Less than 50% reached a score >90% (cut-off for comprehension).
  - Higher age (>75y) and lower level of education (<10y) but not the diagnosis of CHF correlated with lower ET-MP scores, indicating lower medication management skills.
- Apart from providing a standardized written MP, a significant number of patients might benefit from further counselling and continuous care.

## Reference:

[1] Botermann L et al. Patients' handling of a standardized medication plan: a pilot study and method development. Patient Prefer. Adherence 2016; 10: 621–30.

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