


MEDICAL AND PHARMACY STUDENTS' KNOWLEDGE AND SKILLS ON PHARMACOLOGY AND PHARMACOTHERAPY

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INTRODUCTION

- Collaboration of pharmacists and physicians for medication reviews has increased interest over the years.¹
- Better results on level of patient care.²
- Both professionals have own specialists' knowledge and skills.³


1. Geurts MM, Br J Clin Pharmacol 2012; Jul 74(1): 16-33.
 2. Sorensen L, Br J Clin Pharmacol 2004; Dec: 58(6): 648-64.
 3. Gallagher RM, Adv Health Sci Educ Theory Pract 2012; May; 17(2):247-57.



INTRODUCTION


- Only few studies on actual differences
 - professionals: -
 - students: pharmacy > medical students on knowledge on interactions and on recognizing prescription errors.^{4,5}

4. Watholak TL, Am J Pharm Educ 2011; Mar 10; 75(2):24.
 5. Harrington AR, Am J Pharm Educ 2011; Dec 15; 75(10):199.



AIM

to study if pharmacy and medical students differ on pharmacology and pharmacotherapy (P&P) knowledge and skills.



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METHODS

Design cross-sectional design

Population pharmacy and medical students
after graduating bachelors degree

Instrument formative assesment on knowledge and skills
level bachelors degree
50 questions (60 min)

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METHODS

Design assessment

- Based on core

What is the first pass effect?

Domain (3)

Basic knowledge (25 multiple choice)	a 80 year old women with renal failure and a complicated urinary tract infection is presented to the family doctor. What is the best treatment for the UTI in this woman?	interactions/side effects
Case based knowledge (24 multiple choice)	prescribing	groups
Skill (open questions)	You've just visited mr de Jong, suffering end-stage lung carcinoma. The dyspnoea has increased and you decide to start morphine. Write the recipe for him.	interactions/side effects

6. Maxwell S. Br. J Clin Pharmacol 2003; Jun;55(6):496-503.
7. Nierenberg DW. J Clin Pharmacol 1991; Apr;31(4):307-11.

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METHODS

Validity assessment

- construct: based on literature, expert group
- concurrent: compared to expert group, 91% vs 71%, (p<0.001)

Reliability assessment

- item-rest correlation (r_r) no questions excluded
- internal consistence: Guttman labda: 0,5-0,7 (ideally > 0.7)⁸


8. Sijtsma K. Psychometrika 2009; Mar;74(1):107-20.

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METHODS

Data collection

- All students in a mandatory course on pharmacology and pharmacotherapy
 - pharmacy students
 - medical students
- Voluntary participation
- Debriefing with interactive lecture afterwards



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METHODS

Analyses

- T test on mean score in percentages
- ANCOVA, covariates age, sex, previous study, study duration, inclusion year
- Effect size calculations (Cohens δ)⁸
 - > 0,2 small
 - > 0,5 medium
 - > 0,8 large

8. Cohen J. Psychol Bull 1992; Jul;112(1):155-9

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RESULTS

		Medical students (n=451)	Pharmacy students (n=151)	P-value*
age	median (range)	22 (19-45)	23 (20-40)	0.000
gender	female (%)	75	72	0.355
year of inclusion	2010-2011 (n)	222	41	0.000
	2011-2012 (n)	229	110	
start study	median (range)	2007 (2005-2009)	2006 (1998-2008)	0.000
duration study (incl date-start study)	median (range)	3 yr 8 m (1 y 11 m- 6 yr 9 m)	4 yr 10 m (3 yr 2 m - 12 yr 7 m)	0.000
previous relevant study	not or not relevant (n)	411	142	0.166
	relevant (n)	40	8	

*chi square and Mann-Whitney U

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RESULTS

Category	Medical (%)	Pharmacy (%)	Effect Size (δ)
basic knowledge	68.2	77.0	0.88
case based knowledge	72.2	73.8	0.15
skill/recipe	68.6	50.7	0.57


* t-test: p<0.05
† ANCOVA: p<0.05

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RESULTS



Skill	Medical (%)	Pharmacy (%)
1. pharmadynamics	69	74
2. pharmacokinetics	70	79
3. interaction/side effects	72	77
4. ATC groups	64	78
5. prescribing	65	66
6. prescribing special groups	73	75
7. regulations	79	83
8. recipe writing	72	77

* p < 0.05 in ANCOVA
† δ > 0.5 (medium effect)

 **DISCUSSION**

- First study to show differences between both health professional students on different domains of knowledge
- Both students appear to have reciprocal knowledge
- Collaborations can be useful, at least at the level of education
- However,
 - mono-center
 - students are not the same as professionals
 - rather low reliability assessment ⁸

8. Schmitt N. Psychological Assessment 1996;8(4):350-3.

 **CONCLUSION** 

- Pharmacy students have better basic knowledge
- Medical students have better skills
- On case base knowledge differences are too small to be relevant
- Therefore, they can complement each other
- Interdisciplinary collaborations can be useful on the level on education

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