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WEB PAPER

Cross-year peer tutoring on internal medicine wards: Effects on self-assessed clinical competencies – A group control design study

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Abstract

Background: Peer-assisted learning (PAL) has become a well-accepted teaching method within medical education. However, descriptions of on-ward PAL programmes are rare. We introduced a PAL programme with a focus on clinical competencies on internal medicine wards.

Aims: To assess the effects of an on-ward PAL programme on self-assessed clinical competencies.

Method: A total of 168 medical students were randomly assigned to one of the seven intervention wards or one of the seven control wards. During their 5-week ward-placement, the intervention group (IG; $n=88$) received 10 patient-centred tutorials lead by final year tutors: (I) history taking, (II) physical examination, (III) blood withdrawal, (IV) infusion, (V) patient files, (VI and VII) ECG, (VIII–X) chart rounds. The control group (CG; $n=80$) did not take part in the PAL programme. Clinical competencies were self-assessed pre- and post-intervention.

Results: For five of the ten assessed clinical competencies, increases in self-confidence ratings were significantly higher in the IG as compared to CG.

Conclusions: Results provide preliminary evidence to suggest that PAL programmes on internal medicine wards and with final year students as peer tutors may represent a valuable additional tool within medical clerkships. However, the findings must be confirmed and clarified in further research.

Introduction

Peer-assisted learning (PAL) has become an established and well-accepted teaching method in medical education (Santee & Garavalia 2006; Cate & Durning 2007) that offers a variety of advantages for both learners (Santee & Garavalia 2006) and peer-tutors (Sobral 2002; Dandavino et al. 2007). Positive effects of PAL programmes have been demonstrated in controlled designs in the field of gross anatomy (Nnodim 1997), problem-based learning (Kassab et al. 2005), communication skills training (Nestel & Kidd 2005), clinical examination (Field et al. 2007) and resuscitation training (Perkins et al. 2002). For the teaching of clinical skills, Tolsgaard et al. (2007) were able to show that trained student teachers can be equally as effective as associate professors. Nonetheless, descriptions and evaluations of on-ward PAL programmes on clinical skills training are rare.

Alford und Currie (2004) described a model in which medical students shadowed an experienced student performing normal clinical duties for 1 day in every 6 weeks over the period of a year. A qualitative analysis revealed that the model enabled students to gain important insights into the everyday practice of medicine, the process of becoming a doctor,

Practice points

- The PAL has become an established and well-accepted teaching method in medical education.
- A PAL programme on internal medicine wards with final year students as peer tutors is practicable.
- On-ward PAL leads to increased tutee self-confidence with respect to important clinical competencies.
- Further research is needed to confirm and clarify presented findings and to demonstrate the effectiveness of an on-ward PAL programme using objective performance measures.

providers of health care, the nature of real interaction with patients and the highly relevant clinical 'tools of the trade' which they had yet to proficiently acquire.

As far as we are aware, this article represents the first description of a PAL programme conducted on internal medicine wards and utilizing final year students as peer tutors. Using a controlled design, the study aimed to evaluate the effects of the PAL programme on medical students' self-assessed clinical competencies.

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Methods

Tutees, peer tutors and intervention and control wards

In the summer semester of 2007, all 168 medical students currently in their sixth semester took part in the study. Students were allocated to one of the 14 wards at the University of Heidelberg Medical Hospital in Germany for a 5-week ward placement. Based on the evaluations of final year medical students who had carried out ward-placements in the previous 3 years ($n=415$), the wards were divided into two comparable groups of seven intervention wards and control wards. Medical students were randomly assigned to either an intervention ward with final year tutors or a control ward without final year tutors. A total of 88 medical students finally worked on the seven intervention wards (intervention group; 51 female, 37 male; mean age 23.6 years) and 80 medical students on the seven control wards (control group; 58 female, 22 male; mean age 23.2 years). Both participation in tutorials and completion of the evaluation questionnaire were voluntary.

A total of 14 interested final year students (8 female, 6 male; mean age 26.2 years) who were working on the intervention wards during the summer semester of 2007 volunteered to serve as tutors. Peer tutors participated in a half-day tutor-training programme comprising content aspects specific to the field of internal medicine, feedback training and instruction in didactic methods. Furthermore, peer tutors

were provided with an extensive tutor manual, weekly supervision and a financial remuneration of 150 euros. At the time of the study, final year students were also working on the control wards.

PAL programme and internal medicine curriculum

The PAL programme was developed in line with recommendations made by Wadoodi and Crosby (2002) and Ross and Cameron (2007). About 1.5 h of patient-centred tutorials were held twice a week by final year tutors on the intervention wards. Tutorial size ranged from three to eight medical students. Tutorial learning goals focussed on the following competencies: (I) history taking/building relationships with patients, (II) physical examinations, (III) blood withdrawal/applying in-dwelling catheters, (IV) infusion/blood transfusion, (V) completing patient files, (VI and VII) ECG writing and (VIII–X) chart rounds (Table 1). Tutorials primarily took place at the bedside or served as preparation for duties in direct contact with the patient. To this end, additional meetings between tutors and students were possible and expressly desired.

An accompanying credit-point system which required tutees to collect 50 points over the course of the semester (e.g. application of in-dwelling catheter = 1 point) was in place on both intervention and control wards. In addition to their on-ward activities, all medical students also attended symptom-oriented lectures, daily interactive small-group seminars for individual internal medicine sub-specialties,

Table 1. Self-assessed competencies measured pre-/post-intervention: intervention group (IG; $n = 88$) and control group (CG; $n = 80$; scale ranges from 1 = low self-assessed competence to 6 = high self-assessed competence); means, standard deviation (SD), p -value of ANOVA.

Session I–X: Learning goals	IG/CG	Pre intervention		Post intervention		p
		Mean	SD	Mean	SD	
I: History taking/ Building relationships with patients	IG	3.61	±1.01	4.34	±0.67	<0.905 ^b
	CG	3.32	±1.03	3.91	±0.73	
II: Physical examinations	IG	3.11	±1.21	3.87	±0.68	<0.018 ^a
	CG	3.18	±1.00	3.51	±0.88	
III: Blood withdrawal/ Applying in-dwelling catheters	IG	3.04	±0.97	4.00	±0.53	<0.004 ^a
	CG	2.92	±0.96	3.31	±0.91	
IV: Infusion/ Blood transfusion	IG	3.36	±1.17	3.94	±0.92	<0.314 ^b
	CG	3.43	±1.15	3.59	±1.26	
V: Completing patient files	IG	1.71	±1.63	2.96	±1.31	<0.314 ^b
	CG	1.83	±1.63	2.49	±1.36	
VI and VII: ECG writing (2 sessions)	IG	2.03	±1.48	2.93	±1.27	<0.002 ^a
	CG	2.28	±1.50	2.19	±1.58	
VIII–X: Chart rounds (3 sessions)	IG	1.50	±1.50	2.73	±1.28	<0.003 ^a
	CG	1.35	±1.46	1.73	±1.46	
	IG	2.56	±1.47	3.48	±0.91	<0.001 ^a
	CG	2.29	±1.46	2.12	±1.46	
	IG	1.86	±1.54	3.69	±1.08	<0.459 ^b
	CG	1.85	±1.64	3.17	±1.33	
	IG	2.18	±1.29	3.03	±0.91	<0.358 ^b
	CG	2.12	±1.13	2.66	±0.94	

^aPost hoc comparisons revealed significantly higher post-intervention scores for IG as compared to the CG, whereas the two groups did not differ pre-intervention.

^bBoth IG and CG improved, with no significant interaction effect.

lessons in problem-based learning (Huwendiek et al. 2007), a skills-lab training course (Nikendei et al. 2005) and a communication training programme with standardized patients (Schultz et al. 2007).

Evaluation and statistical analysis

Subjective competencies were assessed pre- and post-intervention using self-administered questionnaires with a Likert-scale format (ranging from 1 = low self-assessed competence to 6 = high self-assessed competence). Differences in self-assessment measures were analysed using an ANOVA with the between factor 'Group' (intervention group vs. control group) and the within factor 'Time' (pre-intervention evaluation vs. post-intervention evaluation). Main effects were further examined using *post hoc* tests. The resulting data are presented as mean \pm SD.

Results

Questionnaire return rate

Questionnaire return rate was 86% (pre) vs. 81% (post) in the intervention group and 90% (pre) vs. 74% (post) in the control group.

Self-assessed competencies pre- and post-intervention

Improvements in self-assessed competencies from pre-intervention to post-intervention are shown in Table 1. Significant *post hoc* tests indicating higher post-intervention scores for the intervention as compared to the control group are marked with 'a'. There were no group differences in pre-intervention scores.

Discussion

Results demonstrate the feasibility of a PAL programme for undergraduate medical students on internal medicine wards with final year students serving as peer tutors. Group comparisons of post-intervention self-assessed clinical competencies show a differentiated pattern of significant and non-significant effects, which clearly reflects the medical curriculum on offer at the Medical Hospital. Skills that were also taught in the control group in training sessions beyond the scope of the PAL programme (e.g. blood withdrawal in skills-lab training (Nikendei et al. 2005) or exploration skills in the communication training programme with standardized patients (Schultz et al. 2007) did not significantly differ between intervention group and control group in the post-intervention comparison of self-assessed competencies, whereas differences between the two groups in skills taught exclusively in the peer teaching programme proved significant. Additionally, only the intervention group was supervised in transferring trained skills to the ward. We conclude that an on-ward PAL programme represents a particularly valuable tool for supporting students in medical clerkships, in particular given that the supervision of students performing clinical competencies

in such clerkships is rare (Daelmans et al. 2004; Howley & Wilson 2004).

A limitation of the present study is to be seen in the fact that the correlation between self-assessed competencies and objective performance measures remains controversial (Davis et al. 2006). This is in particular the case given that self-assessment may be seen to rather reflect a person's self-confidence than the objective quality of his/her performance. Nonetheless, the increase in self-confidence may at least lead to an increase in self-efficacy, implying a modification of perception, motivation and activity (Bandura 1993). These effects must, however, be subject to further investigation with objective performance measures.

The introduction of a PAL programme on internal medicine wards with final year students as peer tutors is practical and leads to increased self-assessed competencies in important areas of medical education. Further research is needed to confirm and clarify presented findings and to demonstrate the effectiveness of such a programme using objective performance measures.

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References

- Alford CL, Currie DM. 2004. Introducing first-year medical students to clinical practice by having them 'shadow' third-year clerks. *Teach Learn Med* 16:260–263.
- Bandura A. 1993. Perceived self-efficacy in cognitive development and functioning. *Educ Psychol* 28:117–148.
- Cate OT, Durning S. 2007. Peer teaching in medical education: Twelve reasons to move from theory to practice. *Med Teach* 29:1–9.
- Daelmans HE, Hoogenboom RJ, Donker AJ, Scherpier AJ, Stehouwer CD, Van Der Vleuten CP. 2004. Effectiveness of clinical rotations as a learning environment for achieving competences. *Med Teach* 26:305–312.
- Dandavino M, Snell L, Wiseman J. 2007. Why medical students should learn how to teach. *Med Teach* 27:1–8.
- Davis DA, Mazmanian PE, Fordis M, Van Harrison R, Thorpe KE, Perrier L. 2006. Accuracy of physician self-assessment compared with observed measures of competence: A systematic review. *JAMA* 296:1094–1102.

- Field M, Burke JM, McAllister D, Lloyd DM. 2007. Peer-assisted learning: A novel approach to clinical skills learning for medical students. *Med Educ* 41:411–418.
- Howley LD, Wilson WG. 2004. Direct observation of students during clerkship rotations: A multiyear descriptive study. *Acad Med* 79:276–280.
- Huwendiek S, Skelin S, Nikendei C, Bosse HM, Kischfink M. 2007. PBL in der medizinischen Ausbildung: Erfahrungen an der Medizinischen Fakultät Heidelberg. In: Zumbach J, Weber A, Olsowski G, editors. *Problembasiertes Lernen: Konzepte, Werkzeuge und Fallbeispiele aus dem deutschsprachigen Raum*. Bern: HEP. pp 147–159.
- Kassab S, Abu-Hijleh MF, Al-Shboul Q, Hamdy H. 2005. Student-led tutorials in problem-based learning: Educational outcomes and students' perceptions. *Med Teach* 27:521–526.
- Nestel D, Kidd J. 2005. Peer assisted learning in patient-centred interviewing: The impact on student tutors. *Med Teach* 27:439–444.
- Nikendei C, Zeuch A, Dieckmann P, Roth C, Schafer S, Volkl M, Schellberg D, Herzog W, Jünger J. 2005. Role-playing for more realistic technical skills training. *Med Teach* 27:122–126.
- Nnodim JO. 1997. A controlled trial of peer-teaching in practical gross anatomy. *Clin Anat* 10:112–117.
- Perkins GD, Hulme J, Bion JF. 2002. Peer-led resuscitation training for healthcare students: A randomised controlled study. *Intensive Care Med* 28:698–700.
- Ross MT, Cameron HS. 2007. Peer assisted learning: A planning and implementation framework: AMEE Guide no. 30. *Med Teach* 29:527–545.
- Santee J, Garavalia L. 2006. Peer tutoring programs in health professions schools. *Am J Pharm Educ* 70:70.
- Schultz JH, Schönemann J, Lauber H, Nikendei C, Herzog W, Jünger J. 2007. Einsatz von Standardisierten Patienten im Kommunikations- und Interaktionstraining für Medizinstudierende (Medi-KIT): Bedarfsanalyse – Training – Perspektiven. *Zeitschrift für Gruppendynamik und Organisationsberatung* 38:7–23.
- Sobral DT. 2002. Cross-year peer tutoring experience in a medical school: Conditions and outcomes for student tutors. *Med Educ* 36:1064–1070.
- Tolsgaard MG, Gustafsson A, Rasmussen MB, Hoiby P, Muller CG, Ringsted C. 2007. Student teachers can be as good as associate professors in teaching clinical skills. *Med Teach* 29:553–557.
- Wadoodi A, Crosby JR. 2002. Twelve tips for peer-assisted learning: A classic concept revisited. *Med Teach* 24:241–244.