Medical Teacher

ISSN: 0142-159X (Print) 1466-187X (Online) Journal homepage: informahealthcare.com/journals/imte20

# Interprofessional clinical training improves self-efficacy of health care students

Birgitte Nørgaard, Eva Draborg, Erik Vestergaard, Eva Odgaard, Didde Cramer Jensen & Jan Sørensen

**To cite this article:** Birgitte Nørgaard, Eva Draborg, Erik Vestergaard, Eva Odgaard, Didde Cramer Jensen & Jan Sørensen (2013) Interprofessional clinical training improves self-efficacy of health care students, Medical Teacher, 35:6, e1235-e1242, DOI: 10.3109/0142159X.2012.746452

**To link to this article:** https://doi.org/10.3109/0142159X.2012.746452

Published online: 29 Jan 2013.

2013; 35: e1235–e1242 MEDICAL TEACHER

WEB PAPER

# Interprofessional clinical training improves self-efficacy of health care students

BIRGITTE NØRGAARD[1], EVA DRABORG[2], ERIK VESTERGAARD[1], EVA ODGAARD[3], DIDDE CRAMER JENSEN[2,4] & JAN SØRENSEN[2]

[1]Kolding Hospital, Denmark, [2]University of Southern Denmark, Denmark, [3]University College Lillebaelt, Denmark, [4]Aarhus University, Denmark

## Abstract

**Background:** Interprofessional collaboration potentially enhances patient safety and satisfaction, and reduces tensions and conflicts among health professionals. However, health professionals often lack sufficient knowledge of other professional roles and competences to engage in interprofessional teamwork. The aim of this study was to assess the impact of an interprofessional training programme on students' perceived self-efficacy.

**Methods:** A quasi-experimental study with an intervention group (239 students) and a control group (405 students). The intervention was an interprofessional clinical study (ICS) unit including students from nursing, medicine, physiotherapy, occupational therapy, laboratory technology and radiography. Data on students' perceived self-efficacy were collected through web-based questionnaires. Aspects of self-efficacy measured were: (1) collaboration with other professions in planning goals and actions for patients; (2) collaboration with other professions for rehabilitation; (3) identifying the functions of other professions and (4) assessing and describing patients' needs and problems.

**Results:** All scores of perceived self-efficacy for the ICS group improved over time although one score change was non-significant ($p = 0.08$). After adjustment for baseline differences and the score change for the control group, the ICS group's self-efficacy score gain remained statistically significant.

**Conclusion:** The study showed that interprofessional training improved students' perception of self-efficacy more than traditional clinical training.

## Introduction

Interprofessionality has become an important issue in the debate about requirements of health care professionals and thus highlighted the need to further develop skills in interprofessional collaboration (Wood et al. 2009; Reeves et al. 2010; Rice et al. 2010; Scarvell & Stone 2010; Thistlethwaite & Moran 2010). Health care professionals are expected to work effectively in interprofessional and cross-specialized teams for the benefit of the patients. Interprofessional collaboration has many advantages, e.g. improved patient safety and reduced mortality rates (Morey et al. 2002; Mann et al. 2006), improved satisfaction (Lefebvre et al. 2007) and reduced tensions and conflicts among health professionals (Berry 2007). Furthermore, it has been established that collaborative practice is more effective when there are opportunities for shared decision-making and routine team meetings that enable health care workers to decide on common goals and patient management plans, balance their individual and shared tasks and negotiate shared resources (World Health Organization 2010). Interprofessional team competencies have been described as a necessary basis for creating coherent patient pathways (Lamb & Clutton 2010) and an integrated approach to care (Barr et al. 2011).

## Practice points

- Interprofessional training increases students' perceived self-efficacy more than traditional clinical training.
- Training in interprofessional collaboration is especially beneficial for students with low baseline self-efficacy scores.
- It is possible to evaluate the effect of interprofessional training on perceived self-efficacy using a quasi-experimental study design and the chosen web-based questionnaire.
- Further studies and investigation of the impact of the actual change in self-efficacy on patient satisfaction and patient safety are needed.

Such teamwork can create difficulties, however, as most health care professionals have either insufficient knowledge of each other's professional roles or inadequate competence in teamwork (McNair 2005). Knowledge about interprofessional principles, methods and basic education skills is a precondition for working interprofessionally, and it has been shown that interprofessional training can strengthen health students' competence in interprofessional collaboration (Ponzer et al. 2004; Reeves et al. 2009, 2010).

*Correspondence:* B. Nørgaard, Department of Orthopaedic Surgery, Kolding Hospital, a part of Lillebaelt Hospital, Skovvangen 2-8, 6000 Kolding, Denmark. Tel: + 45 2422 2613; Fax: +45 7636 3086; Email: birgitte.noergaard@slb.regionsyddanmark.dk

ISSN 0142–159X print/ISSN 1466–187X online/13/061235–8 © 2013 Informa UK Ltd.
DOI: 10.3109/0142159X.2012.746452

Consequently, interprofessional training curricula have flourished and are now widespread in many countries, settings and health professions. A yet unresolved question is 'what is the effect of interprofessional training on the students' learning outcome?' This question has been addressed by different evaluations of interprofessional training through assessments of patients' and students' satisfaction in interprofessional settings published during the past 20 years (Barr 2002; Reeves 2002; Ponzer et al. 2004). However, few studies have investigated the impact of interprofessional training on students' perceived learning and changes in attitudes in an experimental set-up (Cooper et al. 2005; Lindqvist et al. 2005a, b). Self-efficacy refers to a person's confidence in own capability of successful performance in a specified situation or framework. Self-efficacy is an essential mechanism for a person's motivation to reach his/her goals and the higher the level of self-efficacy, the higher the level of motivation and the greater the effort to reach a personal goal (Bandura & Cervone 1983; Bandura 1993, 1997). Differences in self-efficacy have been shown to be associated with differences in skill level (Gist & Mitchell 1992; Bandura 1997) and self-efficacy has become a key variable in assessing organizational behaviour (Schwarzer & Fuchs 1995).

The aim of this study was to assess the impact of interprofessional clinical training on students' perception of self-efficacy in interprofessional collaboration.

### The intervention

In 2007, the Department of Orthopaedic Surgery, Kolding Hospital, Denmark, established an interprofessional clinical study (ICS) unit for students from the following professions: nursing, medicine, physiotherapy, occupational therapy, laboratory technology and radiography.

The organization of the ICS was inspired by the explorative work of Barr et al. (2005) with the aim of creating a new environment for learning, where students could learn from each other and develop competence in interprofessional collaboration and reflection.

The ICS developed a two-week clinical training programme for students in the selected professions, who worked in the ward during the day and evening but not at night or weekends. The timing of ICS training differed for the various professions; the students should be at a stage in their education where they had developed a professional identity and were able to contribute constructively to the interprofessional learning process.

The overall objectives of the ICS were that the students after their interprofessional training should be able to:

- enter into interprofessional collaboration to benefit patient treatment, care and rehabilitation,
- practice uni-professional duties and develop knowledge, attitudes and skills according to the students' educational level and
- develop inter- and uni-professional competence based on authentic patients' health problems and management.

A facilitator team that included representatives from the six involved professions was responsible for the ICS training. Based on the available literature on learning and teaching in a clinical set-up, the facilitator competencies were described and included knowledge of supervision and reflection, and documented diploma-level pedagogical skills (Barr et al. 2005; Freeth et al. 2005). As reflection is considered a key strategy in interprofessional learning (Freeth et al. 2005; Oandasan & Reeves 2005), interprofessional reflection was planned as a daily learning scenario in the ICS. The reflection could be placed before, in or after action, and it could be both formal and informal (Carpenter & Dickinson 2008). The formal reflection could be led by one of the facilitators, the project leader, a student or a vicar with specific ethical knowledge.

## Methods

### Design

The study was designed as a quasi-experimental intervention study, where students in the intervention group received interprofessional clinical training at the ICS while students in the control group received usual clinical training. Data collection took place from September 2008 to April 2010. Self-completed web-based questionnaires were administered to students in the two groups before and after their clinical training.

The experimental design is shown in Figure 1. The two streams of students are denoted as the intervention group (ICS) and control group (CG). The design allowed comparison of development over time (i.e. comparison of scores after clinical training (T3) with baseline (T1) for both groups). For the intervention group an additional data collection took place immediately after the clinical training (denoted by T2), thus enabling assessment of short-term effects (i.e. comparison of scores at T2 with T1) and maintenance of the effect over time (i.e. comparison of scores at T3 with T2). The design also enabled comparison of the scores for the two groups before and after their clinical training (i.e. comparison of T1 scores and T3 scores between ICS group and CG). Finally, the design enabled assessment of additional effects (change in scores) due to the intervention (i.e. comparison of ICS (T3–T1) with CG (T3–T1)). This last comparison can be interpreted as the additional effect of the experimental group in comparison with the control group.

### Sample and questionnaire administration

Students for the intervention group were recruited by the clinical training supervisors from the involved university and colleges (University of Southern Denmark, Odense; University College Lillebaelt, Vejle; University College West, Esbjerg and VIA University College, Aarhus).

Students for the control group were recruited from other hospitals in the region and were similar to the intervention group in terms of stage of education and duration of clinical training.

The supervisors responsible for the two groups of students provided lists of names and current e-mail addresses that were

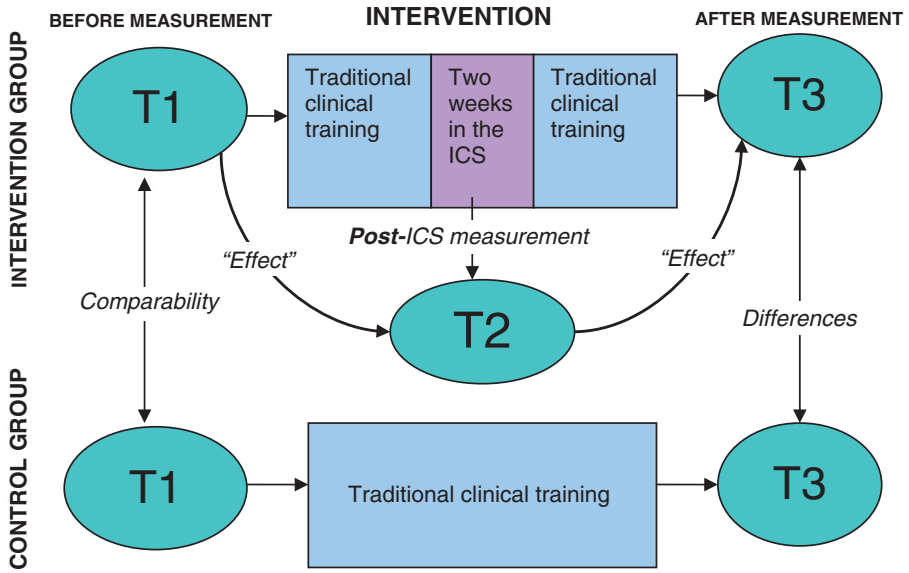


**Figure 1.** Study design.

entered into the web-based survey system 'SurveyXact' (http://www.surveyxact.dk (Danish)). Using the functions of SurveyXact, personal e-mails were sent to all students inviting them to follow a link to their personal questionnaire. A single reminder was sent two weeks later to students who had not yet completed the questionnaire.

## Self-efficacy questions

The online questionnaire included an instrument that assesses perceived self-efficacy in interprofessional collaboration that was pioneered and validated by Parle et al. (1997) and translated into Danish (Ammentorp et al. 2007; Nørgaard 2011). The instrument consisted of the following four questions (in English translation):

> To what extent do you believe that you successfully can . . . (1) *Collaborate with other professions in planning goals and actions for patient rehabilitation?* (2) *Collaborate with other professions for rehabilitation in an inpatient ward?* (3) *Identify the functions of other professions in relation to inpatient care?* (4) *Clearly assess and describe patients' needs and problems, so that other professions can engage in a dialogue about goals and actions?*

The questions were developed by convenience sampling based on the overall aims of the ICS unit. The questions were pilot tested on 15 students; seven students from the ICS and eight students from conventional clinical training. The aim of the piloting was to test whether the questions were understandable and could contribute meaningful answers to the analyses.

Respondents were asked to rate each of these statements on an 11-point scale where 0 denoted 'Not certain at all' and 10 denoted 'Very certain'.

The online questionnaire also included questions on age, gender and professional training.

## Analysis

The study population was first described in terms of gender and profession. In an analysis of non-response, the numbers of students who were invited to respond and those who completed the questionnaires at A1/B1 were compared and a chi-squared test was used to test for differences between the two groups. We estimated response rates separately for the intervention and control groups and tested for differences in characteristics for those students who responded to both T1 and T3 questionnaires and those who only responded to T1 questionnaires.

Variations in the mean scores of the four self-efficacy questions were analysed separately for the ICS and CG at each time of data collection.

In the subsequent analyses we assumed that the four score items were normally distributed, although this could not be confirmed by visual inspection of the normal probability plots or the Shapiro–Wilk test for normal distributed data (partly due to the low number of outcome categories).

We initially applied unpaired *t*-tests to assess the following score difference: ICS baseline versus control group baseline; ICS baseline (T1) versus after the interprofessional training (T2); ICS baseline (T1) versus after the clinical training period (T3); control group baseline (T1) versus after the clinical training period (T3) and finally ICS(T1–T3) versus CG(T1–T3). To test for differences after adjustment for gender, profession, between-group baseline differences and changes over time in the control group, we used mixed regression, which took into account intra-personal correlation.

All statistical analyses were done using Stata release 11 (StataCorp 2001 Statistical software; College station, TX: Stata Corporation).

**Table 1.** Gender and profession of students invited and responding to the self-efficacy questions.

| | Invited to participate | | Respondents | | | | |
|---|---|---|---|---|---|---|---|
| | | | T1 | | T2 | T3 | |
| | ICS ($n=239$) (%) | CG ($n=405$) (%) | ICS ($n=200$) (%) | CG ($n=145$) (%) | ICS ($n=195$) (%) | ICS ($n=127$) (%) | CG ($n=159$) (%) |
| *Gender* | | | | | | | |
| Male | 17.2 | 7.7 | 20.5 | 17.2 | 18.5 | 11.8 | 12.6 |
| Female | 69.5 | 32.6 | 79.5 | 82.8 | 72.8 | 82.7 | 47.8 |
| Not indicated | 13.4 | 59.8 | 0.0 | 0.0 | 8.7 | 5.5 | 39.6 |
| *Students* | | | | | | | |
| Nurse | 35.2 | 55.6 | 34.5 | 30.3 | 30.3 | 45.7 | 57.2 |
| Medical | 12.1 | 11.1 | 13.0 | 13.8 | 14.4 | 13.4 | 6.9 |
| Radiographer | 15.9 | 8.4 | 16.5 | 12.4 | 15.9 | 6.3 | 3.1 |
| Physiotherapist | 16.3 | 14.1 | 18.0 | 22.8 | 19.0 | 14.2 | 17.0 |
| Occupational therapist | 16.7 | 6.4 | 17.0 | 11.0 | 17.4 | 15.8 | 8.2 |
| Medical laboratory technician | 3.8 | 4.4 | 4.0 | 9.7 | 3.1 | 4.7 | 7.6 |

Notes: ICS = interprofessional clinical study unit; CG = control group; T1 = before measurement (Time 1); T2 = measurement after ICS training (only ICS group) (Time 2) and T3 = measurement after clinical training period (Time 3).

## Results

### Population

During the study period the ICS programme recruited 239 students, of whom 200 (84%) completed the baseline questionnaire (T1), 195 (82%) completed the questionnaire immediately after completion of the ICS programme (T2) and 127 (35%) completed the questionnaire after completion of clinical training (T3). Approximately, half (120; 51%) of the ICS students returned both the T1 and T3 questionnaire.

Clinical supervisors from other hospitals identified 405 students for the control group, of whom 145 (36%) students returned the T1 questionnaire and 159 (39%) returned the T3 questionnaire. In all, 95 (23%) students returned both the T1 and T3 questionnaire.

There were no statistically significant differences between the questionnaire responders in the intervention and control groups in terms of gender or professional background (Table 1).

### Self-efficacy

There were no statistically significant differences in mean self-efficacy scores for the two groups at baseline (Table 2). Mean scores on all four self-efficacy questions increased significantly for the students in the intervention group after completion of the ICS programme (T2), and these scores were maintained at the end of the students' clinical training (T3).

Self-efficacy scores for students in the control group showed no significant change at the end of clinical training (T3) for two of the questions, but showed significant increases for 'Identifying other professions' functions' ($p=0.04$) and 'Describing patients' needs to enable interprofessional dialogue' ($p < 0.01$).

Differences over time in the mean self-efficacy scores are presented in Figure 2(a) and (b) for the intervention and control group.

The mean scores were always higher for the intervention group than the control group at T2 and T3, with the between-group difference varying between 0.5 and 0.9. This greater improvement for the intervention group was statistically significant for the first three self-efficacy questions, and borderline for the fourth ($p=0.08$).

Linear mixed regression was used to adjust for gender and profession (Table 3). The mean score difference of the intervention group was still larger than that of the control group although the size of the difference was smaller after adjustment. Radiography and laboratory technology students scored significantly lower than the students from other professions on self-efficacy questions 1, 2 and 4.

No significant differences between men and women were found.

Baseline self-efficacy scores were between 6.5 and 7.4 on a scale from 0 to 10 and therefore data were tested for as ceiling effect. The highest possible score of 10 was obtained in less than 6% at baseline (T1), in less than 9% after the ICS training (T2) and in less than 10% at the end of the clinical training period (T3). To further test the internal reliability of the questionnaire a Cronbach's alpha was estimated for the collapsed questions showing an alpha of 0.85 (between 0.77 and 0.86).

## Discussion

Interprofessional team training increased health care students' perceived self-efficacy in interprofessional collaboration compared to traditional clinical education.

Students from ICS reported higher scores of two dimensions of self-efficacy: question 1 'Collaborate with other

**Table 2.** Scores of self-efficacy.

| | Mean (SD)*n* | Mean (SD)*n* | *p*-value |
|---|---|---|---|
| *Q1: Collaborate with other professions in planning of goals and actions for patients' rehabilitation* | | | |
| ICS(T1) = CG(T1) | 7.4(1.9)200 | 7.2(2.0)145 | 0.45 |
| ICS(T1) = ICS(T2) | 7.4(1.8)176 | 8.4(1.8)176 | <0.01 |
| ICS(T1) = ICS(T3) | 7.4(1.9)120 | 8.2(2.0)120 | <0.01 |
| CG(T1) = CG(T3) | 7.1(2.1)95 | 7.1(2.3)95 | 0.87 |
| ICS(T1–T3) – CG(T1–T3) | 0.8(2.1)120 | 0.0(2.5)95 | 0.01 |
| *Q2: Collaborate with other professions about rehabilitation in an inpatient ward* | | | |
| ICS(T1) = CG(T1) | 7.2(2.1)200 | 7.0(2.0)145 | 0.48 |
| ICS(T1) = ICS(T2) | 7.3(2.0)176 | 8.1(2.0)176 | <0.01 |
| ICS(T1) = ICS(T3) | 7.3(2.0)120 | 8.1(2.0)120 | <0.01 |
| CG(T1) = CG(T3) | 7.0(2.2)95 | 7.1(2.3)95 | 0.78 |
| ICS(T1–T3) – CG(T1–T3) | 0.8(2.1)120 | 0.1(2.6)95 | 0.02 |
| *Q3: Identify other professions' functions concerning inpatients* | | | |
| ICS(T1) = CG(T1) | 6.8(1.9)200 | 6.5(2.2)145 | 0.24 |
| ICS(T1) = ICS(T2) | 6.8(1.9)176 | 8.3(1.6)176 | <0.01 |
| ICS(T1) = ICS(T3) | 6.7(1.9)120 | 8.2(1.5)120 | <0.01 |
| CG(T1) = CG(T3) | 6.4(2.3)95 | 7.1(1.9)95 | 0.04 |
| ICS(T1–T3) – CG(T1–T3) | 1.5(2.1)120 | 0.6(2.8)95 | 0.01 |
| *Q4: Assess and describe patients' needs and problems clearly, so that other professions can engage in a dialogue about goals and actions* | | | |
| ICS(T1) = CG(T1) | 7.1(1.9)200 | 7.1(1.9)145 | 0.87 |
| ICS(T1) = ICS(T2) | 7.1(1.9)176 | 8.0(1.7)176 | <0.01 |
| ICS(T1) = ICS(T3) | 7.0(1.9)120 | 8.2(1.6)120 | <0.01 |
| CG(T1) = CG(T3) | 6.9(2.1)95 | 7.6(1.9)95 | <0.01 |
| ICS(T1–T3) – CG(T1–T3) | 1.2(1.9)120 | 0.7(2.2)95 | 0.08 |

Notes: ICS = interprofessional clinical study unit; CG = control group; T1 = before measurement (Time 1); T2 = measurement after ICS training (only ICS group) (Time 2) and T3 = measurement after clinical training period (Time 3).

professions in planning of goals and actions for patients' rehabilitation' and question 2 'Collaborate with other professions about rehabilitation in an inpatient ward', yet with differences between the professions. The lower scores from radiography and laboratory technology students on self-efficacy questions concerning collaboration in planning and performing rehabilitation might appear to reflect their main role as providers of clinical information to support care providers rather than providing the care itself.

Despite the differences between professions, the differences in self-efficacy mean scores from T1 to T3 were significantly higher in all four dimensions for the ICS group compared to the control group.

Self-efficacy was chosen as the outcome variable as it has previously been shown to be an efficient and reliable method for monitoring professionals' benefits of attending a communication skills training course (Ammentorp et al. 2007; Ammentorp & Kofoed 2009; Nørgaard 2011).

The study has shown significantly increased self-efficacy scores after interprofessional training and the effect was still present at the end of the students' clinical training period. The effect was most clear for the groups with the lowest self-efficacy at baseline, e.g. the laboratory technician students had the lowest baseline self-efficacy (mean 6.6), but the highest self-efficacy at T2 (mean 8.6). This corroborates previous results, where a lower baseline increased the likelihood of a greater effect of an intervention (Riiskjær et al. 2009). However, although the self-efficacy score increased significantly after the interprofessional training, it is not known whether improvement in perceived self-efficacy leads to more collaborative team behaviour. There is limited evidence demonstrating clear positive effects on teamworking within health and social care research. This may in part be due to the measurement challenges inherent in evaluations, different objectives within teams, varying local contexts and the use of different research theories (Jelphs & Dickinson 2008).

Baseline self-efficacy scores were relatively high (varying between 6.5 and 7.4 on a scale from 0 to 10). As it has been pointed out that self-ratings are reactive measures, with the measure itself as an influence on the outcome (Jenkins et al. 2001; Maguire & Pitceathly 2002) it could be argued that the self-rating survey used in this study would represent a methodological weakness, but no ceiling effect was found. The low response rate for the control group (23%) should be noted as it may impact the validity and generalizability of these findings. Results from previous studies are ambiguous regarding the significance of non-responders. While non-participation can result in significantly biased results in some studies (Bergstrand et al. 1983; Rubin 1990), its impact in others appears small (Lasek et al. 1997). The risk of selection bias should be taken into account when drawing conclusions from this study. It could be argued that respondents in the ICS group were those who were particularly positive towards interprofessional training, while responders in the control group may have been those who were more dissatisfied with traditional clinical training. It is reassuring, however, that response rates were similar across professions (data not shown).

The systematic and standardized interprofessional training approach is a major strength of the current study. It appears to have contributed to improve the students' interprofessional skills, and the training was easily adapted to clinical practice. The significant effect of interprofessional training found in this

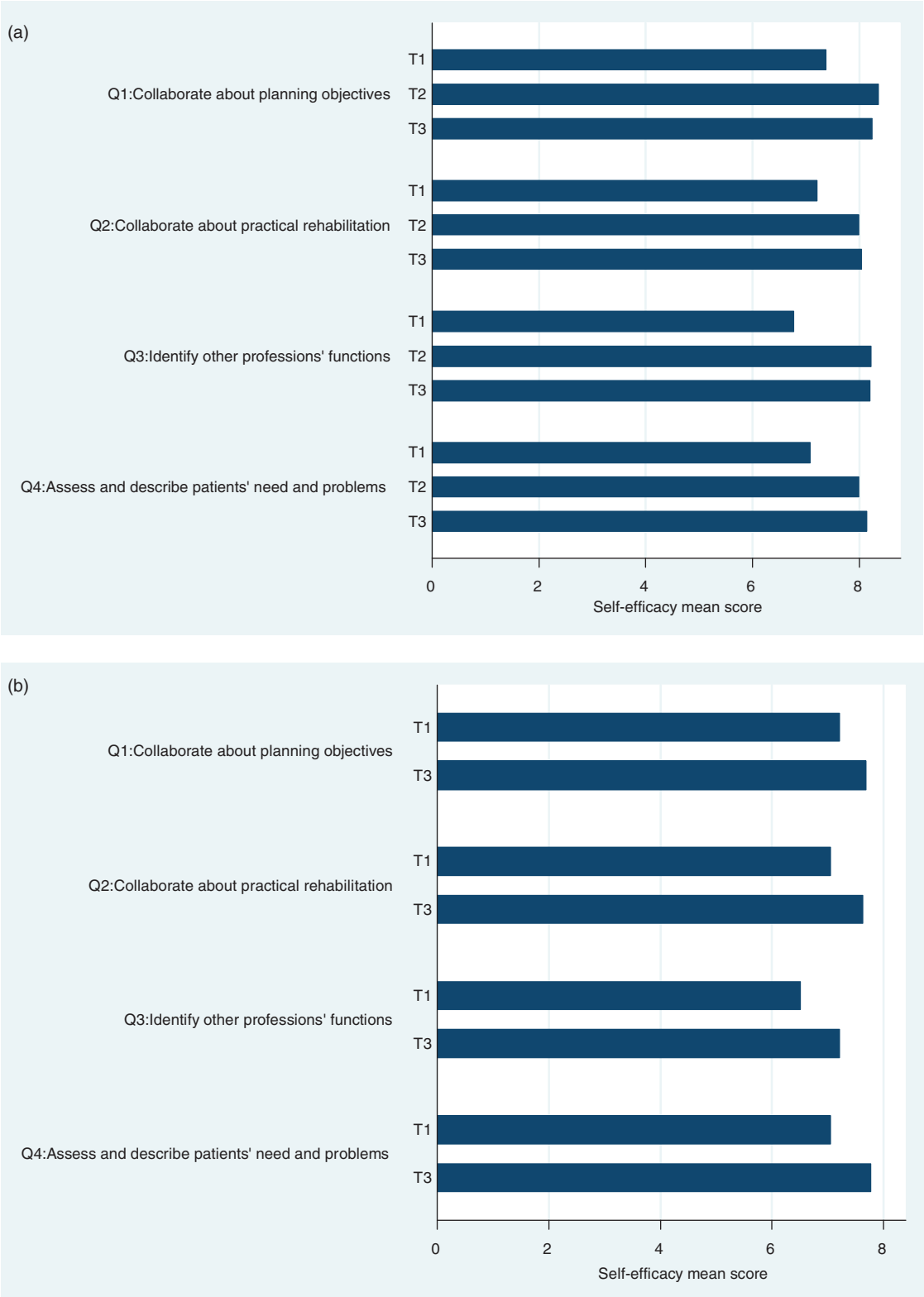


**Figure 2.** (a) ICS students' self-efficacy before (T1) and after (T2) the ICS training, and at the end of their clinical training (T3). A higher score shows higher self-efficacy and (b) control group students' self-efficacy before (T1) and at the end of their clinical training (T3). A higher score shows higher self-efficacy.

study corroborates the results of previous studies, where interventions involving active training methods have produced larger effect sizes than interventions using passive methods (Mansouri & Lockyer 2007). Effectiveness studies can contribute important information in the planning of interventions in larger organizational settings. Further investigation is needed to determine whether interventions only show the intended impact in controlled and limited efficacy studies or

**Table 3.** Mixed regression results of scores for the four self-efficacy questions adjusted for profession.

| Variable | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|
| Gain over time ICS | 0.80** | 0.72* | 0.96** | 0.48 |
| Change over time CG | −0.04 | 0.01 | 0.55* | 0.63* |
| Baseline difference CG–ICS | 0.13 | 0.14 | 0.24 | −0.03 |
| *Profession* | | | | |
| Medical students | 0.24 | 0.00 | 0.38 | 0.10 |
| Radiograph students | −1.23*** | −1.16*** | 0.67* | −0.36 |
| Physiotherapist students | 0.07 | 0.05 | −0.11 | −0.17 |
| Occupational students | −0.32 | −0.46 | −0.23 | −0.70** |
| Medical laboratory technology students | −1.95*** | −2.15 | 0.18 | −2.16*** |
| *Gender* | | | | |
| Male | 0.33 | 0.37 | −0.33 | 0.18 |
| Constant | 7.27*** | 7.19*** | 6.70*** | 7.26*** |
| $R^2$ | 0.14 | 0.16 | 0.12 | 0.15 |
| *n*(obs.) | 561 | 561 | 561 | 561 |
| *n*(pers.) | 346 | 346 | 346 | 346 |

Notes: *$p < 0.005$; **$p < 0.01$ and ***$p < 0.001$.

whether it is possible to transfer the results into real-world situations and thereby improve the quality of patient care.

## Conclusion

Interprofessional team training increased health care students' perceived self-efficacy in interprofessional collaboration compared to traditional clinical education. The ICS students reported significantly higher self-efficacy scores in three out of four dimensions of self-efficacy, and significantly increased self-efficacy mean scores from T1 to T3 in all four dimensions compared to the control group, yet with differences between the professions. Our study contributes evidence of the positive impact of interprofessional training on students' perceived self-efficacy.

### Practice implications

Students perceive to acquire competencies that enhance their interprofessional working through collaborative training involving students from related professional groups. It may be relevant to include interprofessional team training into the curricula for health care students.

## Acknowledgements

We gratefully acknowledge the generous support of Hospital Lillebaelt, the Department of Orthopaedic Surgery, Kolding Hospital, University of Southern Denmark, Odense; University College Lillebaelt, Vejle; University College West, Esbjerg and VIA University College, Aarhus. Editorial assistance by Claire Gudex is also gratefully acknowledged.

***Declaration of interest:*** The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

## Notes on contributors

BIRGITTE NØRGAARD, RN, MNSc, PhD, is a Post Doc at the Emergency Department, Kolding Hospital.

EVA DRABORG, PhD, is an Associate Professor and Head of Studies of Master of Public Quality Management at the Center of Health Economics Research, University of Southern Denmark.

ERIK VESTERGAARD, BPt, MHH Stud., is a Physiotherapist, Department of Orthopaedic Surgery, Kolding Hospital.

EVA ODGAARD, RN, MNSc, is a Lecturer of Nursing at the Department of Nursing, University College Lillebaelt.

DIDDE CRAMER JENSEN, is a PhD student at the Centre for Alcohol and Drug Research at Aarhus University.

JAN SØRENSEN, M.Sc. (health econ.), PhD, is a Professor at the Centre for Applied Health Services Research and Technology Assessment, University of Southern Denmark, Odense.

## References

Ammentorp J, Kofoed PE. 2009. Coach training can improve the self-efficacy of neonatal nurses. A pilot study. Patient Educ Couns 79(2):258–261.

Ammentorp J, Sabroe S, Kofoed PE, Mainz J. 2007. The effect of training in communication skills on medical doctors' and nurses' self-efficacy. A randomized controlled trial. Patient Educ Couns 66(3):270–277.

Bandura A. 1993. Perceived self-efficacy in cognitive development and functioning. Educ Psychol 28(2):117–148.

Bandura A. 1997. Self-efficacy: Toward a unifying theory of behavioral change. Psychol Rev 84(2):191–215.

Bandura A, Cervone D. 1983. Self-evaluative and self-efficacy mechanisms governing the motivational effects of goal systems. J Pers Soc Psychol 45(5):1017–1028.

Barr H. 2002. Interprofessional education – Today, yesterday and tomorrow. A review. UK: Higher Education Academy, Health Sciences and Practice Network. [Accessed 25 June 2012] Available from www.health.ltsn.ac.uk.

Barr H, Helme M, D'Avray L. 2011. Developing interprofessional education in health and social care courses in the United Kingdom, Occasional Paper 12. UK: Health Sciences and Practice Subject Centre, Higher Education Academy.

Barr H, Koppel I, Reeves S, Hammick M, Freeth D. 2005. Effective interprofessional education. Argument, assumption & evidence. Oxford: Blackwell.

Bergstrand R, Vedin A, Wilhelmsson C, Wilhelmsen L. 1983. Bias due to non-participation and heterogeneous sub-groups in population surveys. J Chronic Dis 36(10):725–728.

Berry D. 2007. Health communication. Theory and practice. Berkshire: Open University Press.

Carpenter J, Dickinson H. 2008. Interprofessional education and training. Bristol: The Policy Press.

Cooper H, Spencer-Dawe E, McLean E. 2005. Beginning the process of teamwork: Design, implementation and evaluation of an interprofessional education intervention for first year undergraduate students. J Interprof Care 19(5):492–508.

Freeth D, Hammick M, Reeves S, Koppel I, Barr H. 2005. Effective interprofessional education. Development, delivery & evaluation. Oxford: Blackwell.

Gist ME, Mitchell TR. 1992. Self-efficacy: A theoretical analysis of its determinants and malleability. Acad Manage Rev 17(2):183–211.

Jelphs K, Dickinson H. 2008. Working in teams. Bristol: The Policy Press.

Jenkins VA, Fallowfield LJ, Poole K. 2001. Are members of multidisciplinary teams in breast cancer aware of each other's informational roles? Qual Health Care 10:70–75.

Lamb B, Clutton N. 2010. Crew resource management within interprofessional teamwork development: Improving the safety and quality of the patient pathway in health and social care. J Pract Teach Health Soc Work 10(2):4–27(24).

Lasek R, Barkley W, Harper D, Rosenthal G. 1997. An evaluation on the impact of nonresponse bias on patient satisfaction surveys. Med Care 35(6):646–652.

Lefebvre H, Pelchat D, Levert MJ. 2007. Interdisciplinary family intervention program: A partnership among health professionals, traumatic brain injury patients, and caregiving relatives. J Trauma Nurs 14(2):100–113.

Lindqvist S, Duncan A, Shepstone L, Watts F, Pearce S. 2005a. Case-based learning in cross-professional groups – The development of a pre-registration interprofessional learning programme. J Interprof Care 19(5):509–520.

Lindqvist S, Duncan A, Shepstone L, Watts F, Pearce S. 2005b. Development of the "Attitudes to Health Professionals Questionnaire" (AHPQ): A measure to assess interprofessional attitudes. J Interprof Care 19(3):269–279.

Maguire P, Pitceathly C. 2002. Key communication skills and how to acquire them. Br Med J 325:697–700.

Mann S, Marcus R, Sachs B. 2006. Lessons from the cockpit: How team training can reduce errors on L&D. Contemp OB/GYN 51(1):34.

Mansouri M, Lockyer J. 2007. A meta-analysis of continuing medical education effectiveness. J Contin Educ Health Prof 27(1):6–15.

McNair RP. 2005. The case for educating health care students in professionalism as the core content of interprofessional education. Med Educ 39(5):456–464.

Morey JC, Simon R, Jay GD, Wears RL, Salisbury M, Dukes KA, Berns SD. 2002. Error reduction and performance improvement in the emergency through formal teamwork training: Evaluation results of the MedTeams project. Health Serv Res 37(6):1553–1581.

Nørgaard B. 2011. Communication with patients and colleagues. Dan Med Bull 58(12):1–20, B4359.

Oandasan I, Reeves S. 2005. Key elements in interprofessional education. Part 1: The learner, the educator and the learning context. J Interprof Care 19(Suppl. 1):21–38.

Parle M, Maguire P, Heaven C. 1997. The development of a training model to improve health professionals' skills, self-efficacy and outcome expectancies when communicating with cancer patients. Soc Sci Med 44(2):231–240.

Ponzer S, Hylin U, Kusoffsky A, Lauffs K, Mattiasson AC, Nordström G. 2004. Interprofessional training in the context of clinical practice: Goals and students' perceptions on clinical education wards. Med Educ 38:727–736.

Reeves S. 2002. "It teaches you what to expect in the future . . .": Interprofessional learning on a training ward for medical, nursing, occupational therapy and physiotherapy students. Med Educ 36(4):337–345.

Reeves S, Zwarenstein M, Goldman J, Barr H, Freeth D, Hammick M, Koppel I. 2009. Interprofessional education: Effects on professional practice and health care outcomes (Review). Cochrane Database Syst Rev 23(1):1–22, CD002213.

Reeves S, Zwarenstein M, Goldman J, Barr H, Freeth D, Koppel I, Hammick M. 2010. The effectiveness of interprofessional education: Key findings from a systematic review. J Interprof Care 24(3):230–241.

Rice K, Zwarenstein M, Conn LG, Kenaszchuk C, Russell A, Reeves S. 2010. An intervention to improve interprofessional collaboration and communications: A comparative qualitative study. J Interprof Care 24(4):350–361.

Riiskjær E, Ammentorp J, Nielsen JF, Kofoed PE. 2009. Patient surveys – A key to organizational change? Patient Educ Couns 78(3):394–401.

Rubin H. 1990. Can patients evaluate the quality of hospital care? Med Care Res Rev 47(3):267–326.

Scarvell JM, Stone J. 2010. An interprofessional collaborative practice model for preparation of clinical educators. J Interprof Care 24(4):386–400.

Schwarzer R, Fuchs R. 1995. Self-efficacy and health behaviours. In: Conner M, Normann P, editors. Predicting health behaviour: Research and practice with social cognition models. Buckingham: Open University Press.

Thistlethwaite J, Moran M. 2010. Learning outcomes for interprofessional education (IPE): Literature reveiew and synthesis. J Interprof Care 24(5):503–513.

Wood V, Flavell A, Vanstolk D, Bainbridge L, Nasmith L. 2009. The road to collaboration: Developing an interprofessional competency framework. J Interprof Care 23(6):621–629.

World Health Organization. 2010. Framework for action on interprofessional education and collaborative practice. Geneva: Author.