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Evaluation of an Interprofessional Course on Leadership and Management for Medical and Nursing Pre-registration House Officers

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ABSTRACT

Interprofessional education is about two or more professions learning from, with, and about each other, for the aim of better working together in the future. The aim of this study is to evaluate the outcomes of an interprofessional course on management and leadership for medical and nursing pre-registration house officers. Thirty eight house officers were enrolled in the course on an elective basis. The course comprised three workshops in addition to a collaborative project. Evaluation of the outcomes of the course followed Hammick's four-level model for evaluation of interprofessional education. The participants completed course evaluation questionnaires in addition to a readiness questionnaire administered before and after the implementation of the course. Knowledge acquisition was measured by a paper and pencil test. Acquisition of skills in leadership and management was assessed by the evaluation of the projects. Changes in participants' behaviour towards interprofessional collaboration were evaluated by supervisors, nurses, and colleagues. The *t*-test was used to compare between the results of the pre- and post-tests for assessment of knowledge. It was also used to compare the readiness of the participants, as well as the multi-source feedback about their collaborative attitude before and after the course. Statistical significant improvement was observed in the participants' readiness for interprofessional education, their knowledge in leadership and management, their application of leadership and management skills, as well as their collaborative behaviour at the workplace. The study concluded that the interprofessional course improved the participants' readiness towards interprofessional education, as well as their knowledge, skills, attitudes, and behaviours.

Keywords: *Interprofessional education, Evaluation, Leadership, Management, Pre-registration*

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INTRODUCTION

In its simplest sense, interprofessional education in medical practice means two or more health professions learning from, with, and about each other, to enable effective collaboration and improve health outcomes (1, 2). The focus of interprofessional education (IPE) is on learning together to promote collaborative practice and better care, rather than simply learning together for whatever reason (3). Interprofessional education and practice in health care have been related to improved patient outcomes, enhanced safety and quality of care (4).

Introduction of IPE learning activities in the pre-registration curriculum can add value to the curriculum, since high-quality interprofessional collaboration must be addressed in this period for the effective delivery of high-quality care for different needs in different contexts (5).

A hierarchy of potential benefits of IPE was developed as a framework for considering its outcomes (6). It is inspired by Kirkpatrick's four-level model of evaluation of educational intervention (7). Hammick's hierarchy came in four levels; learners' reaction (Level 1), modification of attitudes and perceptions (Level 2a), acquisition of knowledge and/or skills (Level 2b), change in behaviour (Level 3), change in organisational practice (Level 4a), and benefits to patients (Level 4b).

There is an increasing interest in IPE all over the world. In the UK, several regulatory bodies introduced IPE into their policies, guidelines and requirements. These include the General Medical Council (GMC), the Health Professions Council (HPC), the Nursing and Midwifery Council (NMC), and the General Social Care Council (GSCC) (8). Also, the Quality Assurance Agency (QAA) in UK recommended IPE to be offered by UK universities for all pre-qualifying health and social care students (9).

In Australia, several government policy documents have advocated for the

inclusion of IPE in health professional education programs (10). The Australian Interprofessional Practice and Education Network (AIPPEN) brought together individuals, groups and institutions with an interest in IPE across Australia and New Zealand to promote better health care outcomes through interprofessional education (11).

In 2007, The Canadian Interprofessional Health Collaborative (CIHC) was established in Canada with the mission of advancing interprofessional education and research in order to promote collaborative patient-centered care (12).

In the Middle East, interprofessional education still has little attention from either health or higher education institutions. The reason might be the lack of the educational setting for implementing IPE or the deficiency of the health professions education curricula in addressing IPE (13).

In Egypt, the National Authority for Quality Assurance and Accreditation in Education (NAQAAE) has emphasised IPE by including it in the draft of the second edition of the Egyptian National Academic Reference Standards (NARS) in Medicine, which was developed by NAQAAE to serve as a competency framework for medical graduates. The draft included learning outcomes pertaining to interprofessional collaboration among the competency area "the graduate as a member of the health team and a part of the healthcare system" (14).

The importance of leadership and management in healthcare has become more acknowledged as a result of the increasing complexity of healthcare systems, and the need to link the world of management to the world of medical/clinical practice (15). While management principally focuses on using organisational resources to achieve organisational objectives through management practices, leadership's focus is mainly on inspiring confidence and support among the people who are needed

to achieve the organisational goals, through communication, motivation, coaching, and team development (16). Recently, the concept of “managers who lead” is gaining more popularity, with application of both management and leadership practices together in harmony in order to face challenges and initiate and sustain change (17).

Since different health professions graduates will eventually work together, it would be beneficial to train them on learning and working collaboratively as early as the pre-registration year. Also most of them will practice management and leadership skills during their future professions. Hence this study was designed to evaluate the outcomes of an interprofessional course on management and leadership for medical and nursing house officers to emphasise both IPE and management and leadership concepts and to encourage other health professions institutions to include IPE courses in their official curricula as requested by NAQAAE for the ultimate goal of better healthcare provision.

METHODS

Study Participants

Twenty five house-officers and 13 nursing house officers affiliated to Suez Canal University hospital in Ismailia, Egypt, from both genders were enrolled to the study, and were divided into six interprofessional groups (5–8 members per group). Two rotations in the pre-registration year were selected by the course planners; (a) paediatrics, and (b) gynaecology and obstetrics, and registration for the course was open for house officers in these two rotations, both medical and nursing, on an elective basis.

Course Description

A quasi-experimental single group pre-test post-test design was applied in

this study, where an interprofessional course on leadership and management was implemented (intervention), and knowledge, skills, attitudes, and behaviours of participants were assessed before and after the course. The pre-intervention data (readiness for IPE, knowledge and skills in leadership and management, and collaborative behaviour) was considered as the “control” for the study group, and was compared to the post-intervention data. All participants received training on leadership and management in a course adapted from the pre-service Leadership Development Program (LDP) by Management Science for Health organisation (MSH) (18). This is a 6-month programme that enables learners to acquire leading and managing practices to face challenges and achieve measurable results in complex conditions. The LDP was adapted into a 2-month course, preserving the program core competencies (Table 1). The main learning outcomes of the course were to:

- a. Identify the leadership and management practices that would enable them to face challenges at the workplace;
- b. Develop a shared vision for a certain challenge at the workplace;
- c. Construct a Challenge Model that comprises a measurable result, Strengths Weaknesses Opportunities Threats (SWOT) analysis, root cause analysis, priority actions, an action plan and a monitoring plan to face the selected challenge;
- d. Use different tools and templates during working on the steps of the Challenge Model;
- e. Implement the action plan (collaborative projects);
- f. Work collaboratively in interprofessional teams during learning and during implementation of the projects;
- g. Acquire a responsible attitude towards the community.

The course was implemented at Suez Canal University hospital in Ismailia, Egypt. The course consisted of three

highly interactive workshops that included interactive presentations, group discussions and assignments, and lasted collectively for 36 contact hours. In addition to the workshops, the interprofessional teams used leadership and management tools according to the “challenge model” (17) in order to develop collaborative projects to overcome a challenge in hospital departments where they were receiving training as house-officers. The teams presented their project work in a final seminar that lasted for five hours, where the projects were evaluated by a panel of experts.

The workshops were separated by one week intervals in order to enable the participants

to complete the assignments of the course, and work on the activities of the projects. After the third workshop, a period of four weeks was given to participants to complete the implementation of the action plans and finalise the projects.

Data Collection

To evaluate the outcomes of the course, three of the four levels of Hammick’s model (6) were covered in this study. At the first level “Reaction”, course evaluation forms were distributed to assess the participants’ satisfaction with the course.

Table 1: Course outline

Content	Workshop 1: Introduction and scanning 2-day workshop (12 hours)	Workshop 2: Focusing and planning 2-day workshop (12 hours)	Workshop 3: Aligning/ mobilising and inspiring 2-day workshop (12 hours)	Seminar: Presentation of interprofessional projects (5 hours)
Topics/Tools	<ul style="list-style-type: none"> • Leading and managing for results • Leading and managing practices • Mission & vision and creating a shared vision • The difference between a challenge and a problem • Introduction to the “Challenge Model” • Tools of scanning 	<ul style="list-style-type: none"> • The Challenge Model • Sphere of influence • Developing measurable results with SMART Criteria • Stakeholder analysis • Root cause analysis • Identify priorities • Setting priorities & conduction of action plans 	<ul style="list-style-type: none"> • Mobilising stakeholders • Developing a monitoring plan • Coaching to support others • Gaining commitments • Roles in teamwork • Giving feedback • Making effective requests • Inspiring through building trust • Leading change 	<ul style="list-style-type: none"> • Presentation of collaborative projects • Evaluation by a panel of experts
Outcomes	Teams are mobilised to scan their environment to begin the change process	Development of the Challenge Model for each interprofessional team	Completed Action Plans for each interprofessional team	Interprofessional projects developed to overcome challenges related to infection control in the hospital departments

Level 2a in Hammick's model included distribution of the Readiness for Interprofessional Learning Scale (RIPLS) to the participants of the course before and after its conduction. The RIPLS questionnaire assesses change in attitudes and perceptions of students to interprofessional practice (19). This 19-item scale is arranged in four main domains; teamwork and collaboration (Items 1–9), negative professional identity (Items 10–12), positive professional identity (Items 14–16), and roles and responsibilities (Items 17–19). The scale has been shown to have good validity and reliability (19, 20).

A paper and pencil test consisting of 20 close-ended questions was administered before and after the implementation of the course to assess the acquisition of knowledge in leadership and management (Level 2b). In addition, and since this level also involves acquisition of skills, the evaluation of the projects developed by the interprofessional teams was made by a panel of experts in a final seminar.

As regard, the third level of evaluation (change of behaviour), multisource feedback (360 degree evaluation) was completed by health practitioners working with the course participants, including their supervising physicians, the nurses working in the same wards, and their house officers colleagues who did not share in the study. A 19-item self-administered questionnaire was designed for this purpose and before and after the course in order to assess the change in behaviour. This tool consisted of three main domains; communication skills (7 items), teamwork skills (6 items), and leadership and management skills (6 items). It required ratings by respondents along a five point Likert-type scale.

Data Analysis

Data was processed using the Statistical Package for Social Sciences (SPSS) Version 20. Descriptive data such as the demographic data and course evaluation were presented in a graphic form. Paired

t-test was used as a significance test for comparing the pre/post-tests results of assessment of knowledge. The *t*-test was also used to compare the readiness of the study participants for IPE before and after the course, as well as the change in behaviour assessed by the multisource feedback. The *p* value was considered to be statistically significant at confidence level 95 ($p < 0.05$).

One-way ANOVA test and Post Hoc test were used for comparing the ratings of the multisource feedback. The differences in the ratings were compared using the mean and standard deviation and the significance of one-way ANOVA, ($p < 0.05$) was considered as the cut-off value for statistical significance.

The study was approved by the research methods committee and the research ethics committee at the Faculty of Medicine in Suez Canal University.

RESULTS

Evaluation of the participants' satisfaction with the course revealed that more than 85% of the participants rated the course as "very good". The study participants reported that the course objectives were clearly presented and achieved during the course, and that the course provided them with essential competencies in leadership and management and gave them the opportunity to work and learn from each other.

The results of the study showed statistically significant improvement of the results of the post-measure of RIPLS in all domains for nursing house officers, while they showed statistically significant improvement in the post-measure of RIPLS in three domains only for medical house officers (team work and collaboration, negative professional identify, and positive professional identity) (Table 2). Overall, there was a significant improvement in the post-measure in RIPLS in teamwork and collaboration ($p < 0.001$), positive and negative professional identity

($p < 0.001$), roles and responsibilities domain ($p = 0.012$).

The results of the paper and pencil test to assess change in knowledge (Level 2b) showed improvement in house officers' knowledge regarding leadership and management after the implementation of the course. There was a statistically significant

difference between the scores of the study group before and after the implementation of the course ($p < 0.001$) (Table 3). The study participants also reported achievement of many project outcomes as a demonstration of acquisition of skills in leadership and management (Level 2b).

Table 2: Comparison between the responses of study group (n = 38) in RIPLS before and after the course using paired t-test

RIPLS domains	Medical house officers			Nursing house officers		
	Pre	Post	P-value	Pre	Post	P-value
	Mean ± SD	Mean ± SD		Mean ± SD	Mean ± SD	
Effective team working	2.53 ± 0.641	4.49 ± 0.208	0.000*	3.01 ± 0.210	4.72 ± 0.154	0.000*
Relationships with other professionals	2.91 ± 0.738	4.40 ± 0.412	0.000*	3.12 ± 0.635	4.66 ± 0.181	0.000*
Negative professional identity	3.12 ± 0.869	1.64 ± 0.387	0.000*	3.85 ± 0.947	1.66 ± 0.181	0.000*
Positive professional identity	2.72 ± 0.824	4.18 ± 0.429	0.000*	2.96 ± 0.786	4.66 ± 0.371	0.000*
Roles and responsibilities	3.32 ± 0.368	3.43 ± 0.293	0.225	3.15 ± 0.452	3.52 ± 0.208	0.007*

Note: *Statistically significant at confidence level 95%.

Table 3: Pre- and post-test scores in the paper and pencil test to assess change in knowledge

Group	Pre-test	Post-test	P-Value
	Mean ± SD	Mean ± SD	
Medical house officers (n1 = 25)	9.80 ± 2.29	15.08 ± 2.02	0.000*
Nursing house officers (n2 = 13)	11.31 ± 1.93	16.15 ± 1.86	0.000*
Total (n = 38)	10.32 ± 2.24	15.45 ± 1.98	0.000*

Note: *Statistically significant at confidence level 95%.

A significant improvement was found in the participants' "behaviour" in all the tested domains (communication skills, teamwork, leadership and management skills) as reported in the ratings of the doctors, nurses and peers who completed the self-administered questionnaires based on their observations of the study participants at the workplace. The results of one-way ANOVA for each item in pre/post observation showed that the nurses' responses had higher means in the communication skills, and teamwork, while the colleagues' responses showed

the highest mean in the leadership and management skills (Table 4).

The results of the post hoc test to detect the Least Significant Difference (LSD) among groups revealed that there was a significant difference among the responses of colleagues and nurses, and doctors and nurses in communication skills. There was also a significant difference between the responses of colleagues and doctors, and colleagues and nurses in leadership and management skills.

Table 4: Comparison between the responses of the raters in the multisource feedback before and after the course using paired *t*-test

Items	Doctors			Nurses			Peer PRHOs		
	Pre	Post	<i>p</i>	Pre	Post	<i>p</i>	Pre	Post	<i>p</i>
	Mean ± SD	Mean ± SD		Mean ± SD	Mean ± SD		Mean ± SD	Mean ± SD	
Communication skills	2.89 ± 0.324	4.21 ± 0.248	0.000*	3.93 ± 0.330	4.23 ± 0.291	0.001*	2.91 ± 0.549	4.18 ± 0.311	0.000*
Teamwork	2.85 ± 0.434	4.37 ± 0.322	0.000*	3.11 ± 0.429	4.40 ± 0.299	0.000*	3.04 ± 0.552	4.27 ± 0.273	0.000*
Leadership and management skills	2.65 ± 0.507	4.03 ± 0.332	0.000*	2.89 ± 0.547	4.27 ± 0.348	0.000*	3.44 ± 0.437	4.23 ± 0.278	0.000*

Note: *Statistically significant at confidence level 95%.

DISCUSSION

Although research on interprofessional education has been reported extensively in the literature internationally, there is only one study on IPE conducted in Egypt on undergraduate students in the Faculty of Medicine, Suez Canal University (13). Therefore, the current study is considered as one of the earliest trials to introduce IPE in health professions education in Egypt.

In this study, we developed an IPE course for medical and nursing pre-registration house officers, in which we adapted a 6-month program in leadership and management; the LDP, a program that is implemented around the world as a framework to face challenges and produce

tangible outcomes. IPE usually appears in many forms, such as workshops, courses, and simulation experiences (21). Our choice of conducting the LDP course, adapted from a structured program, was made to facilitate planning and delivering the course within a well-known framework. Leadership and management practices were chosen as the content of the IPE course as they have much in common with the principles of IPE, namely enhanced communication skills, teamwork, and collaboration. Involvement of students in leadership and management has been reported to have a beneficial effect on healthcare delivery and the quality of patient care during actual practice (22).

In this study, the course lasted for two months, which is the duration of one

training rotation in the pre-registration year, in which a group of house-officers including doctors and nurses are trained in the same department in the university hospital. Our choice of the duration of the course and its delivery in the hospital setting were made to avoid obstacles related to competing time of the house-officers and also to implement the course cost-effectively, and with the limited resources we have. All the activities of the course were hands-on, and studying the course produced tangible outcomes, represented in the conduction of collaborative projects by the interprofessional teams. The exposure of our doctors and nurses to this practical experience in IPE was reported by other investigators that it can promote learners' appreciation and value of IPE (23). This was obvious in our study results, in which the readiness for interprofessional learning, with its components; teamwork, positive, and negative professional identities, improved significantly after the conduction of the course.

There exists a debate in the literature whether to introduce IPE pre- or post-qualification (24). Some suggest that the most effective IPE might not occur until after graduations, when health professions have to work in real teams to deliver real health care (25), while other prefer early exposure to IPE activities to eliminate hostility stereotyping (24). The reasons for selecting the pre-registration year, in this study, for introduction of IPE course were: it was the first year where teamwork and true collaboration with other professions would take place, it would help house officers identify their roles in the healthcare team, promote their leadership and management skills, and deal with challenges they face at the workplace. We also believe that undergraduate health profession students in the latter years of their study are more likely to have a greater understanding of their clinical identity compared to students in the first years (26). In addition we look forward that this study would contribute to the literature about introducing IPE

in the first year of practice for medical and nursing graduates as there is little published evidence on IPE in the context of new medical and nursing graduates in the hospital setting, and the particular issues they face in working for the first time in a multidisciplinary health care team (27).

Evaluations of IPE have in many cases focused on changes in students' attitudes, beliefs and perceptions (28). In this study we followed a published framework for evaluation of educational intervention, specially tailored for IPE (6). We decided to not only assess the outcomes of IPE in terms of change in readiness and attitudes towards interprofessional collaboration, but to go beyond that and assess the outcomes at as many levels as possible; reaction, acquisition of knowledge and skills, and change in behaviour.

In our study, the participants reported that the course allowed them to acquire competencies that would help them better work in interprofessional teams in the future. This finding is supported in a similar study, where students reported competencies associated with acquisition of values and ethics for interprofessional practice, roles/responsibilities, and teams/teamwork (23).

A systematic review identified RIPLS questionnaire as the most commonly used validated attitudinal instrument in IPE (29). Usage of this validated tool in our study was important to measure the change of attitudes of the participants towards interprofessional collaboration which represents one of the key learning outcomes for IPE interventions (1). In common with other studies that compared the readiness for interprofessional learning before and after conducting interprofessional modules/courses, the readiness for interprofessional education in our study improved after course delivery. Those studies varied between conducting monthly interprofessional modules for undergraduate students (26), a one credit interprofessional module for undergraduate students (30),

and a one-day workshop involving students from more than four health professions institutions (31). All the three previous studies reported improvement in the post-RIPLS measures.

It was reported that the assessment of learners' behaviours in teams is important and most effective when conducted in the workplace (25). Some studies indicated change in behaviour as a result of IPE (32, 33, 34). However, this change was mainly self-reported perception of change, which may be a weak approach to measuring change in behaviour (35). Therefore, we did not rely solely on the learners' self-reports, and we assessed the change in collaborative behaviour and leadership and management practices by multisource feedback at the workplace, in addition to evaluation of the projects developed by the interprofessional teams. This approach can contribute to future directions for evaluating IPE initiatives (36).

Limitations to the current study include not going beyond the third level of evaluation of educational intervention to assess organisational change or patient outcomes. Also, the fact that the LDP program was adapted to be delivered in a shorter period than originally planned leads to difficulty in comparing the outcomes of the course to the work of others who implemented the full program. An additional limitation in the study was the validation of the tool used for multisource feedback, which was developed by the researchers. This tool was tested for face and content validity only, so further in-depth construct validation will be needed if this instrument is to be used in future research.

CONCLUSION

Introducing training on leadership and management in an interprofessional context for pre-registration house officers of different professions promoted their competencies both in IPE and leadership and management and provided them with

a good opportunity to learn with and from each other, as well as improved their behaviour at the workplace. Our results indicated opportunities for conducting IPE courses within structured frameworks and limited resources. These results can encourage other health profession institutes to apply IPE in different settings.

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