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Paper:

Al-Shaikh, G., Al-Madi, E., Masood, J., Shaikh, Q., Syed, S., Bader, R. & McKimm, J. (2018). Interprofessional learning experiences: Exploring the perception and attitudes of Saudi Arabian medical and dental students. *Medical Teacher*, 1-6.

<http://dx.doi.org/10.1080/0142159X.2018.1465180>

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Original article

Interprofessional learning experiences: Exploring the perception and attitudes of Saudi Arabian Medical and Dental students

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Tables: 2

Word count: 3214

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Abstract

Objective: To evaluate the awareness and attitudes of medical and dental students regarding interprofessional learning (IPL).

Methods: A cross sectional study was conducted with 278 female undergraduate Medical and Dental students from Princess Nourah bint Abdulrahman University, Riyadh. These students undertook IPL in the Foundation block, in basic science teaching, clinical skills' laboratories and in professionalism and learning skills' modules. A modified, validated RIPLS questionnaire with four subscales and 29 items was used to collect data regarding their perception and attitudes towards shared learning. A five point Likert scale was used with a value ranging from 1 (strongly disagree) to 5 (strongly agree) for each item. Factor analysis was done using Varimax rotation. Student's t test was applied to detect difference between mean scores of medical and dental student's responses

Results: The mean age of respondents was 19.8 ± 1.7 years with the majority in the second year of each programme. There was no difference in mean responses of the medical and dental students. The respondents favored shared learning in the areas of professional skills and patient care. They agreed that IPL helps to develop respect, trust and appreciation for other professions; however both groups preferred to learn uni-professionally with regard to developing discrete professional identities and roles.

Conclusion: There is an overall positive response towards IPL and the value of team work; however more attention needs to be paid to enabling students to learn about the specific roles of each profession in the healthcare team.

Key words: interprofessional learning, collaboration, healthcare profession, shared learning

Introduction

Ineffective communication and a lack of coordination between different healthcare professions is one of the most serious issues in the healthcare delivery system leading to clinical errors and poor patient outcomes (Altin et al, 2014). Increased specialization of medical, health and social services has led to fragmentation of health services and less holistic approach to patient care. Adverse events due to poor communication and a loss of understanding of different roles can be reduced if healthcare students experience interprofessional learning (IPL) as part of their preparation for professional practice (Titzer et al, 2015). Interprofessional education (IPE) is defined as an educational intervention where members of more than one health profession learn interactively with, from and about each other to improve collaboration and quality of patient care (Reeves et al, 2013). Working effectively in an inter-disciplinary team is one of the competencies essential to be acquired by healthcare professionals (Kohn et al, 2000); moreover IPE, multidisciplinary team work and collaborative practice are some of the most significant international challenges to healthcare education in 21st century (Frenk et al, 2010).

Though literature supports IPE activities, a fundamental challenge is that healthcare and educational systems are not designed for easy integration of people, processes and information (Kuziemyky and Reeves, 2012). During the past decade, the need for early exposure of undergraduate students to interprofessional training, to meet the demands of changing health systems has been much emphasized (WHO, 2010). The optimum time for IPL is at the undergraduate level, as this helps to develop positive attitudes to collaboration early in professional life (Hind, 2003). Many IPE and IPL programmes have been introduced at undergraduate and postgraduate levels in countries as diverse as the United Kingdom, USA, Canada, the UAE, Nordic countries and Australia in order to help solve multifaceted health

problems and healthcare delivery systems (Barr, 2002; Reeves and Freeth, 2002; El-Zubeir et al, 2006; Hertweck et al, 2012).

The goal of IPL is to enable students to acquire awareness and knowledge about one another's roles and responsibilities, scope of practice and role boundaries. IPL also helps develop more effective team working skills and mutual trust and respect about the contribution of each health professional to patient care (Horsburgh et al, 2001; Ponzer et al, 2004; Barr and Low, 2012). A systematic review of the literature reports an array of positive outcomes resulting from IPL in a range of areas such as emergency department culture, patient satisfaction, collaborative team behavior, diabetes care and a reduction of clinical error rates for emergency department and operating rooms (Reeves et al, 2013). Additionally, students who have been exposed to an IPL programme were more confident about their communication skills and interprofessional interactions as compared to students who were unexposed (Pollard, 2008).

Enhancing the attitudes towards and awareness of undergraduate students through IPL, group work and promotion of collaboration may lead to informed behavioral changes in professional practice (Cooke et al, 2003, Faresjo, 2006). While working as a team, a professional gets a chance to understand the holistic approach to a patient as well as comprehend responsibilities of members of various disciplines in a team, such as doctor, nursing staff, pharmacist, dietitian and physiotherapist etc for enhanced patient care (Tan, 2014). In recent years, teamwork and collaboration between dentists and physicians have been much advocated for better coordination between primary care and oral healthcare (Manski, 2015).

Despite international recognition, no IPE or IPL initiatives have been reported from Saudi Arabia and no data are available about the knowledge and attitudes of health professionals

towards IPE. At Princess Nourah bint Abdulrahman University (PNU) Riyadh, IPE was introduced to Medical and Dental undergraduate students in their Basic Sciences years (first two years of each programme) to promote collaboration, interpersonal communication and teamwork skills between future doctors and dentists. All students and faculty at PNU are female. Although the Medical and Dental undergraduate curricula are mutually exclusive, the students are taught together in the Foundation block, learning skills and professionalism modules. They also learn together in the Basic Sciences' laboratories and the Clinical Skills' laboratories, and are involved in voluntary activities, poster presentations and reflective writing skills. The present study explores the knowledge and attitudes of undergraduate medical and dental students at PNU towards readiness and practice of IPL and collaboration using a modified IPL scale (RIPLS) with 29 items (Parsell and Bligh, 1999). The RIPLS questionnaire has been widely used in evaluating the readiness of students for IPL and thus was selected as a valid instrument for this study.

Methods

This cross-sectional study was conducted at PNU from May 2015 to October 2015, after obtaining ethical approval from the University Research Centre (IRB).

Sample size: All students of Medical and Dental Colleges were included in the study, hence the sample size of this study was "finite population". The adequacy of sample size was determined by considering the N:p ratio; since the total number of respondents were 278 and the number of items in the initial questionnaire was 29 (reduced to 25), so the N:p ratio was 10:1 which is considered adequate.

The first batches of both Medical and Dental Colleges at PNU are in the 4th year of their programme, as both Colleges were established in 2012. All students were informed through an email regarding the objectives of study and were invited to participate in it. Out of total 383 students in both Colleges, 278 took part in the study; 183 out of 268 students from the Medical College (68.3%) and 95 students out of 115 from the Dental College (82.6%). Prior to consenting to participate, students were given an explanatory statement outlining the purpose of study and were informed that participation was voluntary and anonymous. Students were coded according to their programmes and academic year.

Questionnaire

A modified "Readiness for Interprofessional Learning Scale" (**RIPLS**) was used to collect data. The questionnaires were distributed manually among the students by the member of research team at the end of lecture before the lunch break and informed consents were taken. The RIPLS scale measures students' attitudes towards engaging in IPL. Originally the scale was a 19 item questionnaire comprising 3 subscales: team work and collaboration, professional identity and

roles and responsibilities (Parsell and Bligh,1999) which was later revised and extended to 29 items (McFadyen et al, 2005). For this study, a few questions from the later version of the scale were modified and items re-sequenced. The revised subscale titles included: team work and collaboration, professional skills, patient-centeredness and professional identity. The questionnaire was validated for internal consistency.

The scale consists of 29 statements requiring rating by respondents along a 5 point Likert scale. Each point on the scale is assigned a value ranging from 1 (strongly disagree) to 5 (strongly agree) with higher mean scores representing a more positive attitude towards IPL. The questionnaire included four subscales with seven questions relating to the knowledge and skills needed for team work and collaboration, seven questions concerning roles and responsibilities (professional skills), seven questions relating to patient centeredness and benefits to patients, and eight questions linked with professional identity, i.e. the values and beliefs individuals hold regarding their profession. The modified questionnaire had relatively equal numbers of items for each subscale to aid interpretation of the results. The items in the first three scales (team work and collaboration, professional skills and patient centeredness) were framed positively whereas in the fourth scale (professional identity) items were framed negatively. The scoring for the negative items were reversed where "strongly agree" was given the least score i.e. "1" instead of the usual highest score for "strongly agree" adapted for the questionnaire i.e. "5" on a 5 point likert's scale.

Statistical Analysis

Responses were coded and data were analyzed using the Statistical Package for Social Sciences (SPSS) version 20. Frequency, proportion and percentages were computed.

Principal component analysis (factor analysis) was used to reduce the number of factors using Varimax rotation. The factors were identified using a scree plot. Eigen values of greater than one were set a priori to identify factors. A statement was selected if it had a factor loading of 0.5 or higher. Related items were grouped together to describe one theme associated with readiness for interprofessional learning at PNU. Measures of internal consistency (Cronbach's alpha) of subscale items of each factor were calculated.

Student's t-test was performed to detect any differences between the mean scores of the responses.

Results

Overall 278 students responded to the questionnaire; 183 students from the College of Medicine (68.3%) and 95 from the College of Dentistry (82.6%). Mean age of respondents was 19.8 ± 1.7 year. The medical students had a mean age of 19.8 ± 1.1 year and the dental students mean age was 19.7 ± 2.4 year.

Most students who responded from both programmes were in their second year of training (105/278) while the least were from the 4th year (30/278) see Table 1. The responses of Medical and Dental students were generalized and their year-wise categorization was not done because of two reasons: the objective of study was not to determine the responses at different years of school; moreover as the sample size was adequate enough to be used for the whole groups, further categorization by year of school would lead to scarce data and hence reduce the power of the study.

The 29-item RIPLS included 4 themes or sub-components. Factor analysis using Principal component analysis revealed four themes with Eigen values ≥ 1 but, after examining the scree plot, three were chosen for final representation, because they contributed to 54.4% of the total variance. The Eigen value of the first theme was 11 while that of the second factor was 4. A Varimax rotation of selected items with loadings greater than 0.5 was performed that resulted in 3 factors comprising 25 statements. The internal consistency of all 3 factors was above 0.85 showing that the scale has high content validity and reliability (Table 2).

Factor analysis

The three factors were labeled as: professional skills and patient care (factor 1): professional identity (factor 2) and team work and collaboration (factor 3). These factors have high internal

consistency (α) of 0.9, 0.9 and 0.86 respectively. Table 2 shows the statements, factor loadings and internal consistency measures for each factor.

Description of factors

Factor 1: Professional skill and patient care. The factor comprises 10 statements. The statement *IPL will help me to learn and apply methods and tools learned from others* had the highest factor loading (0.768). This was closely followed by four other statements: *IPL will help me to identify additional learning needs* (0.741), *IPL will help me to better interact and communicate with patients* (0.735), and *IPL will help me to better understand patients' problems and needs* (0.730).

Four other statements had factor loadings well above 0.5 minimum. These include: *IPL will help us to provide a better service to the community* (0.699), *IPL will increase my ability to understand clinical problems* (0.686), *IPL will help me to communicate better with patients and other professionals* (0.642) and *Patients would ultimately benefit from IPL because of involvement of expertise from different disciplines* (0.629).

Factor 2: Professional identity: Eight statements contributed to this factor. The statements with highest factor loading in this group were *Clinical problem solving skills should only be learned with students from my own discipline* (0.848). The other two closely following statements included: *I don't want to waste my time learning with other healthcare students* (0.822) and *The functions of nurses and therapists is to provide support for doctors only* (0.805). The other statements with a high factor loading were: *It is not beneficial for undergraduate healthcare students to learn together* (0.785) and *I am not sure what my professional role in IPL would be* (0.754).

Factor 3: Team work and collaboration: this factor comprises seven statements. The items imply that there is need to acquire specific team working and collaborative skills to become effective communicators and be able to contribute their professional knowledge to a multidisciplinary team. The highest rated item overall by students was *IPL will help me develop more respect, trust and appreciation for each profession* (0.792), closely followed by *IPL before qualification would help me understand the different roles in the healthcare team* (0.751). There were three more high ranking statements: *IPL will help me become more effective member of healthcare team* (0.693), *IPL will help me to think positively about other healthcare professionals* (0.668) and *I would welcome the opportunity to work on small group projects with other healthcare students* (0.643). Two remaining statements in this factor were *IPL with other healthcare students before qualification will improve working relationships after qualification* (0.635), and *I would welcome the opportunity to share some generic lectures, tutorials or workshops with other healthcare students* (0.630).

Student's t-test revealed no significant differences in the level of awareness and attitudes between medical and dental students as shown by their almost similar mean scores of responses for each item.

Discussion

This study explores the awareness and attitudes of undergraduate Medical and Dental students at PNU towards the concept of IPE and collaboration after their experience of sharing many learning sessions together. The mean score of responses to the different items from the two groups revealed no significant statistical difference.

The majority of respondents favored shared learning in the areas of achieving professional skills and providing better patient care. They strongly agreed that IPL helped them to learn from one another. While working and learning together, additional learning needs were identified and clinical problems were better understood which is consistent with a study conducted on students from seven healthcare specialties (Williams et al, 2012). Students also highlighted that IPL helped to improve their interactions and communication with patients; it gave them a better understanding of patients' problems and helped them to provide a better service to the community. Shared learning was considered to have a positive impact on the students' relationship with patients because when working together in a group, they can prepare questions to be asked, identify the key facts to be focused on, explore different ways of communicating with patients and learn from one another important skills in the examination of patients. Tan et al (2014) reports that medical, nursing and pharmacy students on an IPL programme involving real patients highly appreciated their different professional roles and realized that good quality patient care cannot be achieved by one single profession (Tan et al, 2014).

As regards team work and collaboration, respondents reported a greater understanding and agreed that the IPL experience enabled them to develop respect, trust and appreciation for other professions. They better understood the different roles in a healthcare team, felt more confident

to be an effective team member and thought more positively about other healthcare professionals. Students acknowledged that trust is a significant factor in the efficacy of teamwork, which echoes Kennard's study which showed that if trust is not evident in a team then interpersonal relationships become dysfunctional (Kennard, 2002). Most of the students were clearly receptive to both working in an interprofessional team and in participating in collaborative learning activities with other healthcare students and were aware of the benefits of both. This is also reported by many studies (e.g. Hind et al, 2003; D'Amour and Oandasan, 2005; Bradley et al, 2009).

Regarding professional identity, both medical and dental students were skeptical as shown by the highest ranking statement of "*Clinical problem solving skills should be learned with students of same discipline*" and "*Time should not be wasted by learning with other students*". These statements are counter-productive to teamwork and contradict previous responses where students held generally positive views towards collaborative learning and teamwork. Since, the participants of this study were medical and dental students whose educational programmes and professional cultures are diverse, they failed to see how learning with other professionals would be useful in their future practical life. They might have thought that the clinical problems that they would be dealing with in medicine and dentistry are irrelevant to one another. This is evident from high ranking of the statement "*There is little overlap between my future role and other healthcare students*". The subscale items suggest that students hold conflicting views about IPL and discipline-based learning which might reflect their early stage of professional identity formation. This finding of both readiness and bias, requires faculty to make a conscious effort to inform students about the roles of various health and social care professionals, how they

intersect and where role boundaries lie so that they can work more effectively in the complexity of modern healthcare systems.

When considering roles of other professionals such as nurses and physiotherapists, both groups highly rated the item that “*Their function is to provide support for doctors only*”. A traditional view of professional practice and relationships reinforced the idea that some healthcare roles should be subservient to others, with the doctor undisputedly being the team leader in patient management (Kendrick, 1995). However, in contemporary health services this view has shifted to flatter hierarchies and that health professionals need to be team players where each professional acts cooperatively and all play important team roles achieving common goals (Xyrichis and Ream, 2008). The team leader should be dictated by the context in which the team operates and this may not be the doctor (Klocko et al, 2012). Another study reported the resistance to IPL initiatives where students did not consider that collaborative sessions helped them to develop the capabilities specific to their profession (Howell, 2009). As noted above, this resistance may originate where there is a simple lack of knowledge of other profession’s roles and responsibilities in a team (Howell, 2009). For effective team function, prejudices which may exist between professionals and ignorance about the roles and duties of other professionals needs to be reduced through increasing knowledge and understanding (Steinert, 2005). Effective curricular and learning strategies should be designed involving students from different disciplines, not only in classroom based settings but also in hospitals, community based IPE and involving real patients. Providing opportunities for team work and giving motivation to learn in a group will enable students to transfer theory into practice. Through purposeful activities in clinical settings, discussion and reflection (for example between a physician, dentist, dietitian

and a pharmacist when they see an older person with uncontrolled diabetes presenting with dental problems) they will start to realize the importance of team work.

The limitation of this study is that data is collected from one university, just two healthcare disciplines were involved and all participants were females. Further year-wise categorization of responses were not done because of small sample size

The strengths of study include being the first in KSA on IPE, including undergraduate students while most of the studies on IPE are on postgraduate students. Further, the study provided quality of evidence by assessing the effectiveness of an IPE intervention. All factors in the questionnaire showed high internal consistency and reliability.

Conclusion

Overall the study revealed a generally positive attitude towards IPL and shared learning and the value of team work. It provided qualified support for the inclusion of IPL and team work activities in the undergraduate curricula of all healthcare disciplines. Efforts should be directed at informing the students about the need for collaboration and recognition of roles of each professional in a modern healthcare system by continuing interprofessional education (CIPE)

Declaration of interest: The authors report no declaration of interest

Practice points

1. Medical and dental undergraduate students were positive about benefits of shared learning in improving communication, professional and team work skills
2. Retaining professional identity with IPL and collaboration are together important for inducing IPL and collaboration among health professions' students
3. IPL and team work skills should be included as a mandatory component in undergraduate curricula of different healthcare professions to improve healthcare

Notes on contributors

Ghadeer K. Al-Shaikh & Ebtissam M.Al-Madi: conceived the idea of study, study design and provided all facilities, reviewed manuscript

Jazba Masood and Rima Badr: Collected data and entered in SPSS program

Sadiqa Syed and Judy Mckimm: Reviewed and modified the items of RIPLS questionnaire, and wrote manuscript

Quratulain Shaikh: Analyzed the data

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Table 1: Year-wise distribution of medical and Dental students

	Medical n (%)	Dental n (%)	Total in each year n (%)
1 st year	62 (33.9)	29 (30.5)	91
2 nd Year	80 (43.7)	25 (26.3)	105
3 rd Year	35 (19)	17 (17.9)	52
4 th Year	6 (3.3)	24 (25.3)	30
Total	183 (65.8)	95 (34.2)	278

Table 2: Factor loading for statements regarding principal factors and their internal consistency

Item no	Statement	Factor 1 (11 items) $\alpha=0.9$	Factor 2 (8 items) $\alpha=0.9$	Factor 3 (7 items) $\alpha=0.86$
B1	IPL will help me to communicate better with patients and other professionals	.642		
B2	IPL will increase my ability to understand clinical problems	.686		
B3	IPL will help me to understand my own professional limitations	.550		
B4	IPL will help me understand the role of other healthcare professionals	.728		
B5	IPL will help me to learn and apply methods and tools learned from others	.768		
B6	IPL will help me to identify additional learning needs	.741		
B7	IPL will help me to better interact and communicate with patients	.735		
C1	IPL will help me to better understand patient's problems and needs	.730		
C6	Patients would ultimately benefit from IPL because of the involvement of expertise from different disciplines	0.629		
C7	IPL helps us to provide a better service to the community	0.699		
D1	It is not beneficial for undergraduate healthcare students to learn together		.788	
D2	I don't want to waste my time learning with other healthcare students		.822	
D3	Clinical problem-solving skills should only be learned with students from my own discipline		.848	
D4	There is little overlap between my future role & other healthcare students		.765	
D5	The function of nurses and therapists is to provide support for doctors only		.805	
D6	I am not sure what my professional role in IPL would be		.754	
D7	I have to acquire much more knowledge and skill than other healthcare students		.668	
D8	I would feel uncomfortable if another healthcare student knew more about a topic than I did		.671	
A1	I would welcome the opportunity to share some generic lectures, tutorials or workshops with other healthcare students			.630
A2	I would welcome the opportunity to work on small group projects with other healthcare students			.643
A3	IPL will help me to think positively about other healthcare professionals			.668
A4	IPL will help me develop more respect, trust and appreciation for each profession			.792
A5	IPL will help me become a more effective member of the healthcare team			.693
A6	IPL before qualification would help me understand the different roles in the healthcare team			.751
A7	IPL with other healthcare students before qualification will improve relationships after qualification			.635

