

## Original Research Article

# Perceptions towards inter-professional education (IPE) among pre-registration health professional students in Sri Lanka

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### ABSTRACT

Introduction of Interprofessional education (IPE) into healthcare professions' curricula has become an important aim globally. Health professional students experience informal interprofessional learning opportunities during their clinical training years. Investigating the attitudes toward IPE and the factors that affect these attitudes among pre-registration students in the different health professions will illuminate the needs and challenges of IPE in Sri Lanka. A cross sectional study was conducted with the students from 8 health professional groups (Medicine, Physiotherapy, Nursing Diploma/ Degree, Medical Laboratory Science (MLS), Pharmacy, Audiology, Speech and Language Therapy) at different health educational institutions. A total of 686 students were invited to complete the self-administered questionnaire. The questionnaire mainly consists of the Readiness for Inter-Professional Learning Scale (RIPLS). The RIPLS data was analyzed using factor analysis, descriptive statistics, t-test and ANOVA. The response rate for the survey was 83%. Only 18.9% of the students reported previous IPE experiences. We sought a three-factor solution but the analysis highlighted that a single factor predominates. According to the 14 items which loaded to this factor, it was named as 'value of teamwork'. The findings suggest that students' attitudes towards IPE are generally positive. The variable factor loading than the original validation suggests that students may need more clarity on the aim of IPE. This study suggests some focused approaches for IPE in Sri Lanka. Promoting the importance of interprofessional learning through educational methods might assist to improve the attitudes toward IPE.

*Keywords: Interprofessional Education, Health professional students, Team work, Professional silos, Roles and responsibilities*

### 1. INTRODUCTION

Interprofessional education, which is designed to promote teamwork among different health professions, is described as occurring when "... two or more professions learn with, from and about each other to improve collaboration and the quality of care" [1]. "The World Health Organization (WHO) first acknowledged interprofessional education (IPE) as an important aspect of healthcare in 1978 and noted that there is an increased trend towards multi-professional teamwork in healthcare supported by an increasing body of evidence" [2]. "The introduction of IPE into the training of healthcare professionals has become an important objective for governments and universities internationally. In the United Kingdom, the government supports interprofessional education in both post-qualification and undergraduate settings" [3].

“Interprofessional education is thought to be important in helping to develop good working relationships between different professionals by promoting positive interprofessional attitudes and behaviors” [1]. “It is proposed that IPE is most effective in promoting teamwork of professionals who have a clear sense of their own professional identity and have experiences to share” [4]. “Pre and post-intervention studies reported a range of benefits from interprofessional education programmes” [5,6]. “However, the information on the development of students’ attitudes towards IPE during their training period, and the long term benefits of IPE programmes is rather limited” [7]. Factors that influence perceptions towards interprofessional learning include conflicting power relationships arising from differences in culture, philosophy, educational requirements, status and backgrounds of health care disciplines; different structures within health and social care organizations, and competing priorities and agendas.

Few institutions offer for students from different health professions to study together in Sri Lanka. Most of the students from different health professions study at different higher educational institutions. Therefore, the health care professionals interact poorly with each other during their basic health professional education. But these different health professionals meet at the same health care setting (hospital). They have to work together to develop good working relationships between different professionals. Therefore, these students do receive informal exposure to interprofessional learning and would be aware of the issues surrounding such experiences.

According to our knowledge there are no research studies that comprehensively explore perceptions towards interprofessional education amongst students in different health Professions in Sri Lanka. Therefore, it would be valuable to investigate the perceptions (including attitudes) towards Interprofessional Learning amongst pre-registration students in the different health professions in Sri Lanka. This information will be useful to understand the issues impacting on health professional teams and the needs and challenges for interprofessional learning.

## **2. MATERIAL AND METHODS**

### **2.2 Study setting**

This cross sectional study was designed with different health professional students almost all health professions being trained at diploma/degree level in Sri Lanka during January 2017 to July 2017 period. Medical and physiotherapy students were selected at Faculty of Medicine, University of Colombo while Nursing diploma students were selected at National Training School, Colombo. MLS, pharmacy, nursing degree students were selected from Faculty of Medical Sciences, University of Sri Jayewardenepura. Audiology and speech and language therapy students were selected at Faculty of Medicine, University of Kelaniya.

### **2.3 Study participants**

The study was conducted including the students who have had prior clinical training for a period of one year, from 8 health professional groups (Medical, Physiotherapy, Nursing diploma, Nursing degree, Medical Laboratory Science (MLS), Pharmacy, Audiology, speech and language therapy) at different health educational institutions. All the second year students were selected to the study as they listen to the patient’s stories and communicate with one another about their role within the health care system. A total of 686 students were invited to complete the self-administered questionnaire. The questionnaire mainly consists of the Readiness for Inter-Professional Learning Scale (RIPLS) [8]. The authors attempted to minimize biases by including second year students who have experienced similar time period in their clinical training where they can communicate directly with the patients within the health care system. This was a sample of convenience based on the all health professions being trained at diploma/degree level in selected health educational institutions in Sri Lanka during the study timeline (January 2017 to July 2017).

### **2.4 Data sources/ measurement (Readiness for Inter-Professional Learning Scale (RIPLS))**

The RIPLS was presented by Parsell and Bligh in 1999 [7] for evaluating interprofessional learning activities. It consists of 19 items scored on a five-point Likert scale. Ratings were scored from 1 (strongly disagree) to 5 (strongly agree) for each of the 19 items. As shown in figure 1, these items were categorized further to three main factors: Teamwork and collaboration (Items 1-9), professional identity (Items 10-16) and professional responsibilities (Items 17-19). This RIPLS tool has been used for different student populations to evaluate inter-professional learning activities [9, 10].

**Teamwork and Collaboration:**

- Q1. Learning with other students will help me become a more effective member of a health care team.
- Q2. Patients would ultimately benefit if health care students worked together to solve patients' problems.
- Q3. Shared learning with other health care students will increase my ability to understand clinical problems.
- Q4. Learning with health care students before qualification would improve relationships after qualification.
- Q5. Communication skills should be learned with other health care students.
- Q6. Shared learning will help me to think positively about other professionals.
- Q7. For small-group learning to work, students need to trust and respect each other.
- Q8. Team-working skills are essential for all health care students to learn.
- Q9. Shared learning will help me to understand my own limitations.

**Professional identity:**

- Q10. I don't want to waste my time learning with other health care students.
- Q11. It is not necessary for undergraduate health care students to learn together.
- Q12. Clinical problem-solving skills can only be learned from my own department.
- Q13. Shared learning with other health care students will help me to communicate better with patients and other professionals.
- Q14. I would welcome the opportunity to work on small-group projects with other health care students.
- Q15. Shared learning will help to clarify the nature of patient problems.
- Q16. Shared learning before qualification will help me become a better team worker.

**Roles and Responsibilities:**

- Q17. The function of nurses and therapists is mainly to provide support for doctors.
- Q18. I'm not sure what my professional role will be.
- Q19. I have to acquire much more knowledge and skills than other health care students.

**Fig 1. The original 19 items and the three factors on the Readiness for Interprofessional Learning Scale (RIPLS) (Parsell and Bligh, 1999).**

## 2.5 Statistical methods

The data was entered in the SPSS (version 22.0, IBM Corporation, Armonk, NY, USA) and analyzed using descriptive statistics and analytical statistical methods (factor analysis, independent sample t-test, one-way ANOVA). The free comments were content analyzed. The p-value  $\leq 0.05$  was considered as the confidence level.

## 3. RESULTS

### 3.1 Participants

A total of 686 students were invited to participate in the study, of which n = 582 filled in the questionnaire, giving an overall response rate of 84.8%. Response rate of different health profession were shown in Table 1. Approximately, 75.1% of respondents were female while 24.9% were male.

**Table 1. Response rate for the questionnaire**

Health Education Program	No of participants invited	No of participants responded	Response rate
Medicine	196	157	80.1%
Nursing Diploma	225	180	80%
Physiotherapy	60	56	93.3%
Pharmacy	60	54	90%

Nursing degree	60	46	76.6%
MLS	30	27	90%
Audiology	25	18	72%
Speech and Language Therapy	60	42	70%

### 3.2 Previous IPE experience

Previous experience of Interprofessional Education among different health professional students in Sri Lanka is presented in Table 2. 18.9% of the total sample of students reported some form of previous experience in interprofessional education which included work experience in the ward setting (informal exposure to IPE). Nursing degree students reported the most (52.2%) healthcare work related IPE experience prior to clinical training while speech and language therapy students rated the lowest percentage.

**Table 2. Previous experience of Inter Professional Education among different health professional students in Sri Lanka**

Course	Percentage
Medicine	23.6%
Nursing Diploma	12.2%
Physiotherapy	14.5%
Pharmacy	12.9%
Nursing degree	52.2%
MLS	11.1%
Audiology	41.2%
Speech and Language Therapy	9.5%

### 3.3 Internal consistency

The Internal consistency of the total RIPLS gave the Cronbach's alpha as 0.637 and item mean as 3.893. The numbers of items, items mean and minimum/ maximum values for each of the 3 RIPLS subscales are presented in Table 3. The Cronbach's alpha was 0.850 for the subscale for value of team work, 0.313 for subscale for roles and responsibilities and 0.184 for the professional silos. The value 0.850 indicated satisfactory internal consistency while other subscales showed low reliability. General statistical recommendation concerning factor analysis often suggested that item groupings with a Cronbach's alpha under 0.6 should not constitute a factor [11]. Therefore, 2<sup>nd</sup> and 3<sup>rd</sup> factors were removed from the further analysis due to low reliability.

**Table 3. Internal consistency of the Readiness for Interprofessional Learning Scale (RIPLS)**

No of items	Cronbach's alpha	Item means	Min/max
14	0.850	4.277	4.006-4.625
3	0.313	3.333	2.706-3.791
2	0.184	2.052	2.044-2.061

### 3.4 Standardized maximum likelihood estimates of the factor loading for the items of RIPLS

In the present study, the questionnaire included the Swedish version of the RIPLS items with alteration of the item 17 and student's free comments regarding Interprofessional Education. Our tests showed that our data did not reflect the original factor structure of the RIPLS. Our factor analysis gave three items groupings but slightly different order of 19 items (Table

4). The factors were; factor 1 (14 items – Q1-Q9 and Q13-Q17), factor 2 (3 items- Q12, Q18, Q19) and factor 3 (2 items- Q10, Q11).

**Table 4. The standardized maximum likelihood estimates of the factor loading for the 19 items**

<b>Subscale</b>	
<b>Value of team work</b>	
C1: Learning with other students / professionals will make me a more effective member of a health care team	.592
C2: Patients would ultimately benefit if health students / professionals worked together	.523
C3: Shared learning with other health students / professionals will increase my ability to understand clinical problems	.674
C4: Communications skills should be learned with other health students / professionals	.585
C5: Team working skills are vital for all health students/ professionals to learn	.493
C6: Shared learning will help me to understand my own professional limitations	.454
C7: Learning between health students before qualification would improve working relationships after qualification	.569
C8: Shared learning will help me think positively about other health care professionals	.633
C9: For small-group learning to work, students / professionals need to respect and trust each other	.382
C13: Shared learning with other health care professionals will help me to communicate better with patients and other professionals	.597
C14: I would welcome the opportunity to work on small group projects with other health care students / professionals	.640
C15: I would welcome the opportunity to share some generic lectures, tutorials or workshops with other health care students / professionals	.639
C16: Shared learning and practice will help me clarify the nature of patients' or clients' problems	.679
C17: Shared learning before and after qualification will help me become a better team worker	.650
<b>Professional silos</b>	
C10: I don't want to waste time learning with other health students / professionals	.166
C11: It is not necessary for undergraduate health care students / professionals to learn together	.251
<b>Roles and responsibilities</b>	
C12: Clinical problem-solving skills can only be learned from my own department	.516
C18: I'm not sure what my professional role will be	.516
C19: I have to acquire much more knowledge and skills than other health care students	.545

Table 5 summarizes individual item and overall mean ratings for the RIPLS items. All the professions showed highest mean score for "Patients would ultimately benefit if health care students worked together to solve patients' problems" item while lowest mean score for the items "opportunity to work on small-group projects with other professionals".

Most of the professions (except physiotherapy, audiology and speech and language therapy) showed their highest mean score for the item C2. Physiotherapy and audiology professions showed their highest mean score for the C9 item while speech and language therapy profession for the item C3. All professions showed the lowest mean score for the C19 item. There is a significant difference ( $p < 0.05$ ) between the professions for the all the items in "Value of team work" subscale except for its item C2 and C14.

**Table 5. Summary of mean scores of items of RIPLS among different health professional students (One-way ANOVA test)**

Item	Mean								Total	p value
	Medicine	Nursing diploma	Physical therapy	Pharmacy	Nursing degree	MLS	Audiology	Speech Therapy		
C1	4.27	4.46	4.30	4.20	4.43	4.11	4.22	4.48	4.34	0.02*
C2	4.59	4.58	4.54	4.72	4.72	4.56	4.61	4.69	4.61	0.59
C3	4.19	4.44	4.52	4.54	4.65	4.19	4.33	4.71	4.41	0.00*
C4	4.26	4.25	4.36	4.30	4.52	3.89	4.06	4.15	4.26	0.02*
C5	4.54	4.54	4.55	4.50	4.72	4.11	4.44	4.52	4.53	0.03*
C6	4.18	4.08	4.14	4.07	3.98	3.48	4.33	4.36	4.11	0.00*
C7	4.05	4.02	4.30	4.36	4.28	3.85	3.89	4.29	4.12	0.00*
C8	4.11	4.23	4.27	4.19	4.27	3.67	3.89	4.50	4.18	0.00*
C9	4.44	4.30	4.57	4.58	4.39	4.11	4.72	4.52	4.42	0.03*
C13	4.10	4.18	3.98	4.33	4.48	4.12	4.33	4.39	4.19	0.01*
C14	3.88	3.99	3.96	4.09	4.22	3.89	3.89	4.21	3.99	0.07
C15	3.60	4.31	4.02	4.15	4.43	3.94	3.94	4.24	4.05	0.00*
C16	3.87	4.29	4.21	4.36	4.41	4.50	4.50	4.48	4.17	0.00*
C17	4.19	4.36	4.41	4.26	4.48	4.44	4.44	4.60	4.32	0.00*

Distribution of RIPLS items with gender and previous experience to IPE are shown in Table 6. No significant difference between male and female students was identified for the items Value of team work subscale. However, both male and female students rated higher mean scores for the item C2 while lowest mean scores for the item C15. Except the items C5 and C8, there was no statistically significant difference for other RIPLS items between the students with and without previous experience of IPE in the healthcare sector.

**Table 6. Distribution of RIPLS items with gender and previous experience to IPE (Independent sample t-test)**

Item	Gender		P value	Previous experience		P value
	Male	Female		Yes	No	
	Mean (SD)	Mean (SD)		Mean (SD)	Mean (SD)	
C1	4.3(0.8)	4.3(0.7)	0.41	4.3(0.8)	4.3(0.7)	0.92
C2	4.6(0.6)	4.6(0.6)	0.65	4.6(0.6)	4.6(0.6)	0.33
C3	4.4(0.7)	4.4(0.7)	0.43	4.4(0.6)	4.4(0.7)	0.55
C4	4.5(0.7)	4.2(0.7)	0.79	4.4(0.6)	4.2(0.7)	0.12
C5	4.5(0.7)	4.5(0.6)	0.89	4.6(0.5)	4.5(0.6)	0.04*
C6	4.1(0.8)	4.1(0.7)	0.69	4.2(0.8)	4.1(0.7)	0.39
C7	4.2(0.9)	4.1(0.7)	0.59	4.2(0.7)	4.1(0.7)	0.11
C8	4.2(0.8)	4.2(0.7)	0.88	4.3(0.7)	4.1(0.7)	0.03*
C9	4.4(0.7)	4.4(0.9)	0.98	4.5(0.6)	4.4(0.8)	0.25
C13	4.2(0.8)	4.2(2.7)	0.90	4.3(0.6)	4.2(0.7)	0.27
C14	4.0(0.9)	3.9(0.9)	0.23	4.1(0.8)	3.9(0.7)	0.26
C15	3.9(0.9)	4.0(2.3)	0.54	4.1(0.9)	4.0(0.8)	0.51
C16	4.0(0.7)	4.2(0.7)	0.80	4.2(0.8)	4.2(0.7)	0.11
C17	4.3(0.8)	4.3(0.8)	0.98	4.4(0.7)	4.3(0.7)	0.74

## 4. DISCUSSION

The present study investigates students' characteristics such as gender, previous working experience and education program have an impact on the students' readiness for IPE and how open minded they are about cooperation with other professions.

### 4.1 Interpretation

Inter Professional Education (IPE) is now spreading worldwide. A novel study showed that students who exposed to IPE were more confident at qualification about their communicative skills, their inter-professional relationships and their professional interactions [12]. But one Swedish study showed that there were no differences found in attitudes between doctors and nurses with IPE traditional curricula [13]. The advance practice of IPE can be seen in UK, Canada, Australia, Japan and Nordic countries, but few universities in these countries have IPE activities in the curricula [12]. In Australia and Canada IPE activities are often included in educational activities in the curricula [14]. In Nordic countries, students participated in IPE activities in hospital wards, often called Inter Professional Training Wards (IPTW) during latter part of their training [15].

## **4.2 Influence of Gender**

Gender is a significant predictor for IPE. Adams et al. [16] also found that gender, profession, previous work experience in health and social care environment were considerable predictors of baseline professional identity. In the present study, females and males scored similarly towards the items under the “Value of team work” subscale and it was not significant ( $p>0.05$ ). But literature had shown that female students (nursing) had more positive attitudes towards team work. One Swedish study also showed that female students showed more positive attitudes towards team work [13]. Female nurses were reported more helpful and supportive towards male doctors but not for female doctors. This suggests an imbalance based on both gender [17]. A previous study about the team work, which showed “women performance best when competing in pure female teams, but men performance best when women are present in competitive environment” [18].

## **4.3 The influence of previous working experience**

In the present study, there were significant differences for the RIPLS items C5 and C8, between the student with and without previous experiences of work in the healthcare sector. It emphasized that the students with previous experiences significantly accept that the team working skills as a vital part to learn and the shared learning is helpful to think positively about other healthcare professionals. Similarly, Coster et al. [19] found that students with previous health care experiences had higher scores on RIPLS and they have shown more positive in their attitudes as they are confident in meeting and learning with students from other groups than those who have less experience. But converse results showed that earlier experiences of working in healthcare experiences had no impact on attitudes towards collaboration [13].

## **4.4 The influence of health education program towards IPE**

In the present study, different health professional students who were in 2<sup>nd</sup> year of their education program, showed significant mean values for majority of RIPLS items (Table 4). 2<sup>nd</sup> year students were selected to the study as they listen to patient stories and communicate with one another about their role within the health care system. Some studies showed that most students begin their education programs with a relatively positive attitude towards IPE [19,20]. In one of the few papers published to date which reported findings from longitudinal 3-year interventional study, found a negative shift in student attitudes to the IPE [21].

In current study, medical students rated significantly lower mean values for most of the items in “Value of team work” component than nursing students. One study has done with nursing and medical students and suggested that nursing students may be more ready than others to accept IPE initiatives [21]. Using the RIPLS scale, Morrison, et al. [22] found that although medical students are enthusiastic about learning about the roles of others, they are generally less positive than the nursing students about IPE, and more protective of their own professional learning. There are differences in perspectives among different educational programs. The nursing education in Sweden covers both behavior (50%) and biology (50%) but medicine is mostly biologically oriented (90%). This difference leads to nursing seemed to welcome team work and collaboration more than medical students [8]. Some studies have found that nursing students' attitudes toward IPE are not exceptional, but they demonstrate slightly or higher RIPLS scores than those in other professions [21].

## **5. CONCLUSION**

There are very limited studies which have compared interprofessional attitudes towards IPE among limited number of professional groups. This study suggests some focused approaches for IPE in Sri Lanka.

In conclusion, the majority groups of healthcare students were positive about learning together by considering the ultimate beneficence to the patients. This finding emphasizes a positive sense to those who recommend the introduction of interprofessional education when commencing an undergraduate healthcare degree programmes.

Furthermore, it is indispensable to consider about the student characteristics when scheming strategies, exceptionally when developing education programs for health students without prior an experience in healthcare field, who may start the program with negative attitudes and lack of perception on imperishable advantages of interprofessional education. This study reckons to the current situation of interprofessional learning and attitudes of health professional students toward IPE. In Sri Lanka, the health context is relatively stagnant and can be resistant to remodel. The impact that occurs from the poor understating between the different healthcare professions can be minimized by executing crucial improvements in team work among healthcare professionals. Students from some health education programs may come with a negative attitude towards IPE. Negative appraisals of such health education programs seem to be reflected in considerably decreased interest towards interprofessional learning into the future. The results of this study are important for the healthcare system in Sri Lanka, which needs to ultimately move toward a better, realistic interdisciplinary team approach.

## LIMITATIONS

As each health profession group has trained in different healthcare settings, even the participants that exhibit similar characteristics, the study outcomes might become multi-dimensional. Also the answers reported were based on student self-perceptions as opposed to actual change in student knowledge.

## GENERALIZABILITY

The findings from this study support the need to enforce appropriate educational methods to improve the attitudes toward interprofessional education by promoting the importance of interprofessional learning as part of clinical training not only during their undergraduate period but also after the graduation.

## SUGGESTIONS

It is recommended to evaluate knowledge and perceptions of the students and their educators regarding the content related to the interprofessional or multidisciplinary learning in the curriculum of each degree/diploma programmes in future research. Also, it is suggested to investigate the perception of health course coordinators regarding the inter-professional education in different disciplines.

## CONSENT

As per international standard, A written informed consent was obtained from all the participants and preserved by the author(s).

## ETHICAL APPROVAL

The ethical clearance was obtained from the Ethics Review Committee, Faculty of Medicine, University of Colombo (EC/13/016). The research was conducted in accordance to the declaration of Helsinki latest reference.

## REFERENCES

1. Centre for the Advancement of Interprofessional Education (CAIPE) (1997, updated 2002) *Interprofessional Education: A Definition*. CAIPE bulletin no. 13. Available online at <https://www.caipe.org/resources/publications/archived-publications/caipe-bulletin-nos-13-1997-interprofessional-education-what-how-when> (accessed 19 April 2023).
2. Learning together to work together for health. Report of a WHO Study Group on Multiprofessional Education of Health Personnel: the Team Approach. *World Health Organ Tech Rep Ser*. 1988;769:1-72.
3. Reeves S, Freeth D. The London training ward: an innovative interprofessional learning initiative. *J Interprof Care*. 2002;16(1):41-52.
4. Funnell P. "Exploring the value of interprofessional shared learning." *Interprofessional relations in health care*. 1995: 163-71.

5. Fineberg IC, Wenger NS, Forrow L. Interdisciplinary education: evaluation of a palliative care training intervention for pre-professionals. *Acad Med*. 2004;79(8):769-76.
6. Berger-Estilita J, Fuchs A, Hahn M, Chiang H, Greif R. Attitudes towards Interprofessional education in the medical curriculum: a systematic review of the literature. *BMC Med Educ*. 2020;20(1):254.
7. Carpenter J, Barnes D, Dickinson C, Wooff D. Outcomes of interprofessional education for Community Mental Health Services in England: the longitudinal evaluation of a postgraduate programme. *J Interprof Care*. 2006;20(2):145-61.
8. Parsell G, Bligh J. The development of a questionnaire to assess the readiness of health care students for interprofessional learning (RIPLS). *Med Educ*. 1999;33(2):95-100.
9. Woermann U, Weltsch L, Kunz A, Stricker D, Guttormsen S. Attitude towards and Readiness for Interprofessional Education in Medical and Nursing Students of Bern. *GMS J Med Educ*. 2016;33(5):Doc73.
10. Talwalkar JS, Fahs DB, Kayingo G, Wong R, Jeon S, Honan L. Readiness for interprofessional learning among healthcare professional students. *Int J Med Educ*. 2016;7:144-8.
11. Norman GR. In: *International Handbook of Research in Medical Education*. Kluwer Academic Publishers; 2002:97-126.
12. Pollard KC, Miers ME. From students to professionals: results of a longitudinal study of attitudes to pre-qualifying collaborative learning and working in health and social care in the United Kingdom. *J Interprof Care*. 2008;22(4):399-416.
13. Hansson A, Foldevi M, Mattsson B. Medical students' attitudes toward collaboration between doctors and nurses - a comparison between two Swedish universities. *J Interprof Care*. 2010;24(3):242-50.
14. Thistlethwaite J, Lee A, Dunston R, Nisbet G, Matthews L, Pockett R. Interprofessional developments in Australia - L-TIPP (Aus) and the Way Forward. *J Interprof Care*. 2009;23(4):315-7.
15. Jacobsen F, Fink AM, Marcussen V, Larsen K, Hansen TB. Interprofessional undergraduate clinical learning: results from a three year project in a Danish Interprofessional Training Unit. *J Interprof Care*. 2009;23(1):30-40.
16. Adams K, Hean S, Sturgis P, Clark J. Investigating the factors influencing professional identity of first-year health and social care students. *Learning in Health and Social Care*. 2006;5: 55-68.
17. Zelek B, Phillips SP. Gender and power: Nurses and doctors in Canada. *Int J Equity Health*. 2003;2: 1.
18. Ivanova-Stenzel R, Kübler D. Gender differences in team work and team competition. *J Econ Psychol*. 2011;32: 797-808.
19. Coster S, Norman I, Murrells T, et al. Interprofessional attitudes amongst undergraduate students in the health professions: a longitudinal questionnaire survey. *Int J Nurs Stud*. 2008;45(11):1667-81.
20. McFadyen AK, Webster VS, Maclaren WM, O'Neill MA. Interprofessional attitudes and perceptions: Results from a longitudinal controlled trial of pre-registration health and social care students in Scotland. *J Interprof Care*. 2010;24(5):549-64.
21. Pollard KC, Miers ME, Gilchrist M, Sayers A. A comparison of interprofessional perceptions and working relationships among health and social care students: the results of a 3-year intervention. *Health Soc Care Community*. 2006;14(6):541-52.
22. Morison S, Boohan M, Moutray M, Jenkins J. Developing pre-qualification inter-professional education for nursing and medical students: sampling student attitudes to guide development. *Nurse Educ Pract*. 2004;4(1):20-9.