

Original Article

Emergency Nurses' Attitudes toward Interprofessional Collaboration and Teamwork and Their Affecting Factors: A Cross-Sectional Study

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ABSTRACT

Background: The emergency department (ED) is a multidisciplinary department and seriously needs interprofessional collaboration (IPC). **Objectives:** The purpose of this study was to examine the emergency nurses' attitudes toward IPC and teamwork and their affecting factors. **Methods:** A cross-sectional study was conducted on 138 emergency nurses working in teaching hospitals affiliated to Tabriz University of Medical Sciences, Tabriz, Iran, from January to April 2019. Data were collected using a three-part questionnaire including a demographic data sheet, the Jefferson Scale of Attitudes toward Physician-Nurse Collaboration, and the Testing Team Attitude Questionnaire. The data were analyzed using descriptive statistics, Pearson's correlation coefficient, analysis of variance, and multivariate regression analysis. **Results:** The majority of the study participants were female (68.1%), in the age range of 30–40 years old (44.2%), and had a working experience of 1–5 years in the ED (63.8%). The mean scores of nurses' attitudes toward IPC and teamwork were 48.68 ± 5.14 and 96.15 ± 8.97 , respectively. A direct and strong correlation was found between nurses' attitudes toward IPC and teamwork ($r = 0.594$, $P = 0.001$). Regression analysis showed that, among all variables, only the participants' employment status (compulsory governmental services, $P < 0.031$ and $B = 2.356$), overall work experience between 1 and 5 years ($P < 0.001$ and $B = -3.769$), and the attitude toward teamwork ($P < 0.001$ and $B = 0.350$) could significantly predict nurses' attitude toward IPC. **Conclusion:** The attitudes of emergency nurses toward IPC and teamwork were at an optimal level. Nurses' belief in IPC and especially belief in nurse–physician collaboration plays an important role in providing quality care and keeping patient safety in ED. Joint in-service workshops on the philosophy and principles of IPC and teamwork for nurses and physicians working in EDs can further strengthen the IPC.

KEYWORDS: Attitude, Emergency nurse, Health care, Interprofessional collaboration, Teamwork

INTRODUCTION

Interprofessional collaboration (IPC) refers to the interaction of a number of professionals with specific, yet interdependent responsibilities.^[1] This process is of paramount importance in the emergency department (ED) due to the critical work environment, the large number of staff, and the complexity of the work.^[2] Appropriate IPC can promote health-care quality, improve patient care, enhance job satisfaction of personnel, and develop holistic health care,^[3,4] whereas

weak IPC is associated with increased medical errors, decreased patient safety,^[5,6] decreased quality of health care, and prolonged hospitalization.^[6–8]

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Teamwork has also been defined as “cooperative or coordinated efforts on the part of a group of persons acting together as a team or in the interests of a common cause.”^[9] Both teamwork and IPC require a group of people working together to achieve a common goal. The main distinction between teamwork and IPC is that teamwork combines the individual efforts of team members to achieve a goal, but professionals who work collaboratively complete a project collectively. People who collaborate work together as equals, usually without a leader, to finish a project or make decisions together to achieve a goal. However, teamwork is usually supervised by a leader, and those within a team are assigned individual tasks to complete to contribute toward the team’s end goal.^[10] Although the interaction is an important feature both in teamwork and IPC, it seems that maximum interaction occurs in IPC.^[11]

Studies showed that teamwork and IPC in the ED can improve the quality of health care and patient safety, reduce clinical errors, shorten patient waiting times, and solve staff shortages.^[7,8] On the other hand, noncooperation and poor teamwork would result in overlapping tasks, waste of time, and resources in emergency situations and endanger the lives of patients.^[12]

Intra- and IPC necessitates having common and measurable goals,^[13] collaboration and mutual understanding,^[14] believe in the principle of teamwork,^[3] and the ability to establish effective solidarity among team members.^[15] On the other hand, it can be threatened by many factors such as noninteractive and authoritative relationships, especially by physicians.^[3]

Despite the importance of IPC in providing health services – especially in EDs – contradictory results were reported on the nurses’ attitudes toward IPC. For example, studies in Illinois, United States (US),^[16] and South Africa^[17] showed that nurses have positive attitudes toward the IPC. However, in two studies in the United Kingdom^[18] and Ireland,^[19] nurses reported a negative to moderate attitude toward nurse–physician collaboration. Studies in Iran also reported contradictory results in this regard. For instance, a study in teaching hospitals of Tabriz city reported nurses’ positive attitude toward IPC.^[20] In another study in Alborz province hospitals, 52% of nurses rated the quality of nurse–physician collaborations as moderate,^[21] whereas in a study in East Azerbaijan hospitals, only 13% of nurses rated the quality of nurse–physician collaborations as good.^[22]

It has been found that factors such as work experience, gender, cultural differences, workplace,

and communication skills affect the desire for IPC.^[23] However, despite the global importance of IPC and teamwork, little is known about the effect of attitude toward teamwork and the desire for IPC, especially in emergency situations.^[24,25] Due to the inconsistent results on nurses’ attitudes toward teamwork and IPC^[16-20] and the lack of adequate studies on emergency nurses and given the importance of nurse–physician collaboration in the ED, the question arises whether the emergency nurses’ attitudes of IPC are favorable? And, whether emergency nurses’ attitudes toward teamwork can influence their collaboration, especially with emergency physicians?

Objectives

The purpose of this study was to examine the emergency nurses’ attitudes toward IPC and teamwork and their affecting factors.

METHODS

Design and participants

A cross-sectional study was conducted on 138 nurses working in the EDs of teaching hospitals affiliated to Tabriz University of Medical Sciences, Tabriz, Iran.

The sample size was estimated using the results of a former study, in which the mean score of nurses’ attitude toward IPC was 48.05 ± 5.75 .^[20] Then, using the formula for estimating the mean of a quantitative variable [Figure 1] and given a confidence level of 95%, a δ of 5.75, a measurement precision (d) of 1, and considering an attrition rate of 10%, a sample of 141 samples was estimated to be needed for the study.

Inclusion criteria were being employed in an ED affiliated to one of the Tabriz teaching medical centers, at least 1 year of work experience in the ED, having a bachelor’s or master’s degree in nursing, and working as a clinical nurse. Exclusion criteria included a participant’s decision to not to complete the questionnaire and failure to respond to more than 20% of items.

The participants were recruited using a Quota convenience sampling method. To this end, with the cooperation of the nursing office in each hospital, lists of nurses with inclusion criteria were prepared. Then, the quota needed in each ED was calculated, and the needed samples were recruited conveniently from those who were willing to participate. The first researcher

$$n = \frac{Z^2 \frac{\alpha}{2} \sigma^2}{d^2}$$

Figure 1: The sample size formula

referred to the EDs in different working shifts to find the eligible and willing participants.

Instruments

A demographic characteristic questionnaire, the Jefferson Scale of Attitudes toward Physician-Nurse Collaboration (JSAPNC), and the Testing Team Attitude Questionnaire (T-TAQ) were used for data collection.

The demographic characteristic questionnaire included questions on nurses' age, gender, marital status, education level, employment status, type of shift work, overall work experience, years of working in the ED, and work experience in other specialized hospital wards.

The JSAPNC is a 15-item scale designed for measuring both nurse and physician attitudes toward physician-nurse professional collaboration.^[26] Items are distributed in four domains: Shared Education and Collaborative Relationships (seven items), Caring as Opposed to Curing (3 items), Nurse's Autonomy (3 items), and Physician's Authority (2 items). All items are rated on a four-point Likert scale from 1: "strongly disagree" to 4: "strongly agree." Items 8 and 10 that are related to the dimension of "physician's authority" are scored inversely. The total score of the scale could range from 15 to 60, and higher scores indicate a better attitude toward IPC. The validity and the reliability of the Persian translation of the JSAPNC have been assessed by Pakpour *et al.*, and the Cronbach's alpha coefficient was 0.87.^[20] In the present study, the content validity of this scale was confirmed by ten nursing professors, and its reliability was examined on thirty nurses and confirmed with a Cronbach's alpha of 0.83.

The original T-TAQ is a 30-item scale for measuring individual attitudes related to the core components of teamwork. Items are distributed in five domains of team structure, leadership, situation monitoring, mutual support, and communication.^[27] Najafi *et al.* assessed and confirmed the validity and reliability of the Persian translation of the T-TAQ. They removed six items from the mutual support domain and one item from the communication domain due to the acquisition of a Cronbach's alpha below 0.6. Therefore, the Persian translation of T-TAQ consists of 23 items with an overall Cronbach's alpha coefficient of 0.80. All items are rated on a five-point Likert scale from 1: "strongly disagree" to 5: "strongly agree."^[28] The total score of the scale can range from 23 to 115, and higher scores indicate a more positive attitude toward teamwork.^[29] In the present study, the content validity of this scale was confirmed by ten nursing faculty members, and its reliability was examined on thirty nurses and confirmed with a Cronbach's alpha of 0.87.

Ethical considerations

This study was a master thesis approved by the Research Ethics Committee of Tabriz University of Medical Sciences, Tabriz, Iran (ethics approval code: IR.TBZMED.REC.1397.685). The aims of the study were explained to the participants. Participation in the study was voluntary, data were managed confidentially, and findings were reported anonymously. All participants signed written informed consent before participation in the study.

Data analysis

The data were analyzed in SPSS software version 16.0 (SPSS Inc., Chicago, IL, USA). The normal distribution of the quantitative variables was evaluated by the Kolmogorov-Smirnov test, and the distribution of data was normal. Descriptive statistics were used to calculate the frequency distribution, mean, and standard deviation of the variables. Pearson's correlation coefficient was utilized to determine the relationship between variables. *T*-test was used to compare the mean scores of attitude toward IPC and teamwork between two subgroups of the participants. One-way analysis of variance and the Tukey's *post hoc* test were used to compare the mean scores of attitudes toward IPC and teamwork between three or more subgroups of the participants. Multiple regression analysis was used to examine the factors associated with IPC. To this end, first, the backward model was conducted with the removal criterion of $P > 0.10$. Then, all the remaining variables with $P < 0.10$ were again entered into the model and analyzed using the forward method. Before we performed the multiple regression analysis, the categorical variables were first converted to dummy variables to represent subgroups of the samples. Furthermore, to enter the ordinal variables into the model, we coded them as 0, 1, 2, and so on. $P < 0.05$ was considered statistically significant.

RESULTS

Of the 141 nurses, 138 completed and returned the study questionnaires. The majority of study participants were female (68.1%), in the age range of 30–40 years old (44.2%), and had a working experience of 1–5 years in the ED (63.8%) [Table 1].

Considering the items of the teamwork scale, the majority of nurses believed that "it is appropriate for team members to offer assistance to their counterparts who may be tired or stressed (93.5%)" and that "leaders should create informal opportunities for team members to share information." Furthermore, regarding the items of IPC scale, the majority of nurses believed that "nurses should be involved in making policies affecting their working conditions" (94.9%) and "IPC between

Table 1: Demographic characteristics of nurses participating in the study

| Variable | n (%) |
|--|------------|
| Age (years) | |
| <30 | 50 (36.2) |
| 30-40 | 61 (44.2) |
| Up to 40 | 27 (19.6) |
| Gender | |
| Male | 44 (31.9) |
| Female | 94 (68.1) |
| Marital status | |
| Single | 51 (36.9) |
| Married | 87 (63.1) |
| Education level | |
| Bachelor's degree | 116 (84.1) |
| Master's degree | 22 (15.9) |
| Employment status | |
| Permanent official | 61 (44.2) |
| Permanent contractual | 33 (23.9) |
| Contractual | 10 (7.2) |
| Compulsory governmental services | 27 (19.6) |
| Other | 7 (5.1) |
| Overall work experience (years) | |
| 1-5 | 49 (35.6) |
| 6-10 | 33 (23.9) |
| 11-15 | 32 (23.2) |
| 16-20 | 18 (13.0) |
| Over 20 | 6 (4.3) |
| Emergency work experience (years) | |
| 1-5 | 88 (63.8) |
| 6-10 | 30 (21.7) |
| 11-15 | 16 (11.6) |
| 16-20 | 4 (2.9) |
| Working shift | |
| Routine morning | 17 (12.3) |
| Rotating | 121 (87.7) |
| Experience in EDs | |
| Resuscitation unit | 8 (5.8) |
| Trauma unit | 18 (13.0) |
| Internal unit | 15 (10.9) |
| General unit | 50 (36.2) |
| Gynecology unit | 4 (2.9) |
| Other units | 15 (10.9) |
| More than one unit | 28 (20.3) |
| Work experience in other specialized wards | |
| Yes | 51 (37.0) |
| No | 87 (63.0) |

ED: Emergency department

physicians and nurses should be included in their educational programmers" (94.2%) [Table 2].

The mean scores of nurses' attitudes toward IPC and teamwork were 48.68 ± 5.14 and 96.15 ± 8.97 , respectively. Pearson's correlation coefficient test revealed a direct and strong correlation between nurses' attitudes toward IPC and teamwork ($r = 0.594$, $P = 0.001$).

As presented in Table 3, the mean attitude toward IPC was significantly higher among nurses with the age of 30–40 years ($P = 0.016$), permanent official employment ($P = 0.041$), and overall work experience of 6–10 years ($P = 0.005$). However, none of the participants' characteristics could significantly affect their attitude toward teamwork.

Multiple linear regression showed that, among all variables entered into the model, only the participants' employment status (compulsory governmental services, $P < 0.031$ and $B = 2.356$), overall work experience between 5 and 10 years ($P < 0.031$ and $B = 2.356$), and the attitude toward teamwork ($P < 0.001$ and $B = 0.350$) could significantly predict nurses' attitude toward IPC [adjusted $R^2 = 0.446$, Table 4].

DISCUSSION

In the present study, nurses possessed more than 81% of the score of attitude toward IPC. This finding indicates that nurses have a good attitude toward IPC. This finding is consistent with the results of earlier studies in South Africa,^[17] Iran,^[20,30] Palestine,^[31] Australia,^[32] and Egypt.^[33] A study in Ethiopia has also reported that nurses had a favorable attitude toward IPC despite dissatisfaction with physicians' collaboration.^[34] However, a study in Italy reported that nurses had a negative attitude toward IPC, which might be attributable to the dominant traditional hierarchical structure prevailing in clinical settings.^[35] Some studies in Cyprus,^[36] United Kingdom,^[18] and Ireland^[19] have also reported that nurses working in ICUs^[36] and hospital wards other than EDs reported negative-to-moderate attitude toward nurse–physician collaboration.^[18,19] Although the instruments used in different studies and the work climate of different wards are not the same, and therefore, the results of studies might not be precisely comparable, these studies show that nurses work setting might have an important effect on their attitude toward IPC.^[23,37]

In the present study, nurses of higher age showed a better attitude toward IPC. This finding was in contrast to the result of a study in Shiraz, in which nurses' lower age was associated with a better attitude toward IPC.^[38] On the other hand, an earlier study in Tabriz found no significant correlation between nurses' age and their attitude toward IPC.^[20]

In the current study, nurses with more appropriate employment status and those with more work experience showed a better attitude toward IPC. These findings were in line with the results of Pakpour *et al.* how studied nurses' viewpoint on nurse–physician interprofessional relationships.^[20] However, two studies

Table 2: The frequency of items of teamwork and interprofessional collaboration scales that nurses were mostly agreed on

| Items | Agree and strongly agree, n (%) | Neutral to strongly disagree, n (%) |
|--|---------------------------------|---------------------------------------|
| Attitude toward teamwork | | |
| It is appropriate for team member to offer assistance to their counterparts who may be tired or stressed | 129 (93.5) | 9 (6.5) |
| Leaders should create informal opportunities for team members to share information | 128 (92.8) | 10 (7.2) |
| Teams that do not communicate effectively significantly increase their risk of committing errors | 125 (90.6) | 13 (9.4) |
| It is a leader's responsibility to model appropriate team behavior | 123 (89.1) | 15 (10.9) |
| The team's mission is of greater value than the goals of individual team members | 116 (84.1) | 22 (15.9) |
| Effective team members can anticipate the needs of other team members | 113 (81.9) | 25 (18.1) |
| Poor communication is the most common cause of reported errors | 111 (80.4) | 27 (19.6) |
| Items | Agree and strongly agree, n (%) | Disagree and strongly disagree, n (%) |
| Inclination to IPC | | |
| Nurses should be involved in making policies affecting their working conditions | 131 (94.9) | 7 (5.1) |
| IPC between physicians and nurses should be included in their educational programmers | 130 (94.2) | 8 (5.8) |
| During their education, medical, and nursing students should be involved in teamwork in order to understand their respective roles | 129 (93.5) | 9 (6.5) |
| Nurses should be viewed as a collaborators and colleagues of physicians rather than their assistants | 127 (92) | 11 (8) |
| Nurses should be involved in making policy decisions concerning the hospital support services upon which their work depends | 127 (92) | 11 (8) |
| There are many overlapping areas of responsibility between physicians and nurses | 123 (89.1) | 15 (10.9) |
| Physicians and nurses should contribute to decisions regarding the hospital discharge of patients | 121 (87.7) | 17 (12.3) |

IPC: Interprofessional collaboration

in the United States^[39] and Iran^[23] reported opposite findings. Nonetheless, it seems that, with increasing work experience and improving the employment status of nurses, their attitude toward IPC will improve. However, further studies in this area can help clarify these relationships.

We found no significant relationship between nurses' attitude toward IPC and their other characteristics such as work experience in other specialized wards, having extra shifts, type of shift, marital status, and the number of their children that was consistent with the results of some previous studies.^[20,23,38]

The present study showed that nurses had also a positive attitude toward teamwork. This finding is in agreement with a number of studies in hospitals of Kerman,^[29] Australia,^[8] and Scotland.^[40] The study also revealed a strong direct correlation between emergency nurses' attitudes toward IPC and teamwork so that a better attitude toward IPC increased the nurses' inclination to teamwork. Regression analysis also showed that, attitude toward teamwork could significantly predict nurses' attitudes toward IPC. Teamwork and IPC are the cornerstones of quality care and patient safety and

require common goals and mutual understanding between nurses and other health-care professionals – especially physicians,^[3,14] without such an understanding, it is hard to achieve the health-care goals.^[41] As Santos *et al.*^[42] and Vafadar *et al.*^[43] reported, although IPC and teamwork are close constructs, understanding IPC and its philosophy, as well as giving superiority to patient safety are the core prerequisites for the enhancement of teamwork.

Among the variables entered in the regression analysis, only the participants' employment status of compulsory governmental services, overall work experience of 1–5 years, and the attitude toward teamwork could significantly predict nurses' attitude toward IPC. Further studies are suggested to investigate the factors affecting nurses' attitude toward IPC.

The current study had limitations to consider when using its results including small sample size, the mere survey of nurses' attitudes, probability of inaccuracy in answering questions due to time constraints in the ED, and the use of a convenience sampling method. Therefore, further studies with larger and random samples are recommended.

Table 3: Comparison of the mean attitudes toward interprofessional collaboration and teamwork based on the nurses characteristics

| Variable | Attitude toward IPC | P | Attitude toward teamwork | P |
|--|---------------------|-------|--------------------------|-------|
| Age (years) | | | | |
| <30 ^b | 47.10 ± 5.69 | 0.016 | 94.46 ± 10.53 | 0.108 |
| 30-40 ^b | 49.88 ± 4.70 | | 97.93 ± 8.14 | |
| 41 and over | 48.88 ± 4.38 | | 95.25 ± 6.97 | |
| Gender | | | | |
| Male | 48.57 ± 5.20 | 0.723 | 96.25 ± 8.98 | 0.844 |
| Female | 48.90 ± 5.08 | | 95.93 ± 9.06 | |
| Marital status | | | | |
| Single | 47.71 ± 6.02 | 0.104 | 94.89 ± 10.38 | 0.209 |
| Married | 49.21 ± 4.57 | | 96.93 ± 8.14 | |
| Education level | | | | |
| Bachelor's degree | 48.67 ± 5.34 | 0.964 | 95.98 ± 9.22 | 0.612 |
| Master's degree | 48.72 ± 4.04 | | 97.04 ± 7.63 | |
| Employment status | | | | |
| Permanent official | 49.54 ± 4.74 | 0.041 | 97.22 ± 7.40 | 0.107 |
| Permanent contractual | 49.24 ± 4.80 | | 97.27 ± 7.76 | |
| Contractual | 48.60 ± 4.62 | | 98.00 ± 11.03 | |
| Compulsory governmental services | 47.29 ± 5.17 | | 93.07 ± 10.72 | |
| Other ^c | 44.00 ± 8.08 | | 90.71 ± 13.70 | |
| Overall work experience (years) | | | | |
| 1-5 ^d | 46.53 ± 5.58 | 0.005 | 93.75 ± 10.59 | 0.091 |
| 6-10 | 50.48 ± 4.65 | | 99.30 ± 7.64 | |
| 11-15 | 50.25 ± 4.35 | | 97.15 ± 8.12 | |
| 16-20 | 48.88 ± 4.25 | | 95.44 ± 6.97 | |
| Over 20 | 47.60 ± 5.45 | | 97.00 ± 6.12 | |
| Emergency work experience (years) | | | | |
| 1-5 | 48.28 ± 5.47 | 0.239 | 95.37 ± 9.66 | 0.471 |
| 6-10 | 49.00 ± 4.49 | | 97.83 ± 7.07 | |
| 11-15 | 49.06 ± 3.85 | | 96.25 ± 8.66 | |
| 16-20 | 53.50 ± 5.74 | | 100.25 ± 6.70 | |
| Working shift | | | | |
| Routine morning | 50.64 ± 4.88 | 0.093 | 96.06 ± 9.68 | 0.877 |
| Rotating | 48.40 ± 5.14 | | 96.10 ± 8.91 | |
| The section of the ED mostly worked in | | | | |
| Resuscitation unit | 46.50 ± 3.85 | 0.295 | 94.50 ± 5.31 | 0.231 |
| Trauma unit | 48.27 ± 5.45 | | 96.05 ± 6.19 | |
| Internal unit | 49.00 ± 4.08 | | 98.40 ± 6.70 | |
| General unit | 48.04 ± 5.51 | | 94.46 ± 10.47 | |
| Gynecology unit | 53.75 ± 4.19 | | 101.75 ± 11.17 | |
| Other units | 49.86 ± 5.90 | | 100.40 ± 9.76 | |
| More than one unit | 49.17 ± 4.57 | | 95.42 ± 8.20 | |
| Work experience in other specialized wards | | | | |
| Yes | 47.84 ± 5.40 | 0.144 | 95.43 ± 8.07 | 0.472 |
| No | 49.17 ± 4.95 | | 96.57 ± 9.48 | |

^aData presented as mean ± SD, ^{b,c,d}According to the Tykey *post hoc* test only these categories were different with other categories. SD: Standard deviation, IPC: Interprofessional collaboration, ED: Emergency department

CONCLUSION

The findings of the present study demonstrated that the attitude of emergency nurses toward IPC was at an optimal level. Nurses have also a positive attitude toward teamwork. Nurses' belief in IPC and especially belief in

nurse-physician collaboration plays an important role in providing quality care and keeping patient safety in EDs. Joint in-service workshops on the philosophy and principles of IPC and teamwork for nurses and physicians working in EDs can further strengthen the

Table 4: Results of regression analysis to investigate variable predicting the nurses' attitude toward interprofessional collaboration

| Variable (reference category) | Unstandardized coefficients | | Standardized coefficients | <i>t</i> | <i>P</i> |
|--|-----------------------------|-----------|---------------------------|----------|----------|
| | <i>B</i> | <i>SE</i> | β | | |
| Constant | 16.207 | 3.719 | | 4.357 | <0.001 |
| Attitude toward teamwork | 0.350 | 0.038 | 0.600 | 9.247 | <0.001 |
| Compulsory governmental services (other employment status) | 2.356 | 1.081 | 0.185 | 2.180 | 0.031 |
| Work experience 1-5 years (work experience over 20 years) | -3.769 | 0.938 | -0.360 | -4.019 | <0.001 |
| Work experience 5-10 years (work experience over 20 years) | -1.496 | 0.837 | -0.124 | -1.788 | 0.076 |

Adjusted $R^2=0.446$. SE: Standard error

IPC. Furthermore, contents in these areas should be strengthened in nursing and medicine curricula.

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Conflicts of interest

There are no conflicts of interest.

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