**Assessment of interprofessional professionalism among surgical team members**

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**Abstract**

**Introduction:**

The aim of the study was to assess the behavior of interprofessional professionalism among team members in surgical departments. The study is a descriptive and cross-sectional study conducted in two phases. Firstly, the validity and reliability of a tool were assessed. Secondly, the behaviors of interprofessional professionalism among the participants (surgical residents, surgical technologists, and anesthesia technicians (n=113)) in the surgical departments were assessed. Interprofessional professionalism assessment tool consists of 18 items categorized in four domains: altruism, excellence, respect and communication. Internal consistency and reproducibility of IPA were analyzed. The validity of the IPA was confirmed through consensus of experts. The reliability of the tool was confirmed by Cronbach's alpha = 0.83 and ICC= 0.74. The scores of interprofessional professionalism reported in the below expectations level (1.16 (0.27)). It is suggested to develop supportive mechanism and interprofessional educational system to achieve the goal of interprofessional professionalism in health care systems.

**Keywords:**

Interprofessional, professionalism, assessment, validation, surgery, operating room  
Introduction

**Introduction**

Patient safety has been identified as one of the major goals of health care systems(1). In recent decades, the complexity and specialty of health care services have made challenges in patient safety (1). Interprofessional collaboration is introduced as a strategy to achieve patient safety by providing team-based care (1, 2). Interprofessional collaboration is defined as the healthcare personals from different professions working together with the patient, family, and other health personnel to provide the highest quality of care (2). Interprofessional collaboration is a complex and multi-dimensional concept that include competencies such as communication, role recognition, and teamwork (3). The interprofessional collaboration were highlighted commitment to the common goal, recognizing one’s own roles and responsibilities and other members of the health care team, managing ethical challenges in interpersonal and interprofessional conflicts (4). Commitment to professionalism principles and team values is one of the key factors in the success of interprofessional teams (3, 5). Interprofessional values include respect for role and expertise of other health professions**,** develop a trusting relationship and commitment to honesty and integrity in relationships with patients, families, and other team members (3, 6, 7).

The educational system plays a key role in forming the professional identity and establishing commitment to professionalism principles among learners (8, 9). The effective teaching process and assessment system support learners to adherence the professional values and ​​interprofessional collaboration principles (7, 10). Zijlstra-Shaw classified the professionalism assessment tools in four categories include written examination and performance record, competency-based assessment in simulated environments, and observational examination (11). In this regards, observational examination recommended as a tool to assess the participants' commitment to real environments (11).

The use of observational examination in the real environment can be a good indicator to assess professional behavior ​​and interprofessional values among learners (11). There are few instruments to assess professionalism in interprofessional collaboration process(12). Frost et. al. developed interprofessional professionalism assessment (IPA) as an observational tool in 2019(7). There were found no valid tool for assessing the interprofessional professionalism of learners in the investigated context. The aim of the present study was to assess the validity and reliability of IPA in X context. In addition, the behaviors of surgical team members related to interprofessional professionalism were assessed in X University of Medical Sciences.

**Method:**

The present study is a descriptive and cross-sectional study conducted in two phases. In the first phase, the validity and reliability of IPA were assessed. In the second phase, the interprofessional professionalism of the team members in the surgical departments was assessed.

**Participants:** Surgical residents, surgical technologist, and anesthesia technicians (n=113) were entered by census in X University of Medical Sciences. In this study, the evaluators included two faculty members in general surgery and the surgical technology departments.

**Assessment tool:** IPA consists of 18 items that categorized in four domains: altruism (4 items), excellence (5 items), respect (4 items) and communication (5 items). The five-point Likert scale used to scoring of IPA tool (7).

**Phase I: Validity assessment of IPA**

In the first step, the tool was translated by two translators. After comparing the translated texts, a draft of the translations was prepared. Next, the Persian version was translated into English by a fluent expert (back-translation). The translated version compared with the original questionnaire and confirmed by experts. Finally, the Persian version of IPA was prepared. The face validity and content validity of the questionnaire were assessed using the Delphi technique (three rounds). In the first round, the translated version of IPA and guidance form was sent to 23 experts in the different fields (medical education, clinical specialist who has work experiences about teaching or research in professionalism field). The experts' opinions and suggestions were collected after two weeks. The suggestions were added to the original text and resent for implementing the second round and experts were asked to review further comments. Then, experts’ comments were collected and analyzed and the third round was held. No new comment has been submitted in the third rounds. Next, the content validity indices including content validity ratio (CVR) and content validity index (CVI) were assessed in viewpoints of various experts (medical education, clinical practitioners, and professional ethics) (n=23). They assessed the necessity of each items using a 3-point scale. In order to calculate the content validity index, the degree of relevance of the items was assessed using a 4-point Likert scale. Next, the reliability of IPA was evaluated by internal consistency and reproducibility (test-retest approach).

**Phase II: Assessment of interprofessional professionalism**

The interprofessional professionalism assessment of surgical team members were conducted by two evaluators in the surgical department at X Hospital. Firstly, the evaluators attended in the training sessions. The evaluators were familiar to the assessment principles of interprofessional professionalism concepts, IPA items and their scoring. The evaluation was performed by evaluators after observing professional behavior of participants in at least two times in consecutive shifts.

**Data analysis**: Internal consistency and reproducibility was analyzed using Cronbach's alpha and the Intra Class Correlation Coefficient (ICC). Data were analyzed using descriptive (frequency, percentage, mean and S.D) and analytical tests (T-test and ANOVA) in the second phase. The level of significance has considered at p < .05. Data were analyzed by SPSS 16.

**Results**

**Participants:**

In the validation phase, 23 experts in medical education and clinical specialists were attended in the present study. The participants included 13 men (%56.53) and 10 women (%43.47) and the mean age of experts 38.5 years (8.88). 74 personnel and residents in operating room consisted of 34 men (45.95%) and 40 women (54.05%) were entered to assess the internal consistency of IPA. The assessment of reproducibility of IPA were conducted through assessing the participants in different disciplines (n=10) at twice time points.

In the second phase, the surgical technologists, anesthesia technicians and surgical residents (general surgery, otolaryngology, ophthalmology, internal medicine, cardiology, and orthopedics) were entered by census (n=113). (Table 1).

**Phase I:** The results showed that the content and face validity of the tool were confirmed by a consensus of experts. Content validity indices of the IPA were confirmed by CVR = 0.71 and CVI = 0.91. The results showed that the internal consistency and reproducibility of the tool was confirmed by Cronbach's alpha coefficient = 0.83 and ICC= 0.74, respectively.

**Phase II:** The results showed that the scores of interprofessional professionalism among team members in the surgical department were reported as 1.13 (0.27) and the minimum score was 1.00 and the maximum score was 3.28. The results showed the scores of participants in the excellence were reported in the below expectations level (1.04±0.12). There was no significant difference between the participants’ score of IPA and their gender (p-value = 0.09). (p-value = 0.38). The results showed that the IPA scores of participants in different disciplines were not significantly different (p-value = 0.24). In addition, there was no significant difference between the IPA scores of residents in different specialties (p-value = 0.30) and academic years of residency program (p-value = 0.78). The results showed there was a significant difference between the excellence score of residents significantly higher than other participants (p-value = 0.0001). (Table 2 and Table 3).

**Discussion:**   
Commitment to professional values ​​was defined one of the essential elements of interprofessional collaboration (3). Due to the high sensitivity of surgical activities in the operating rooms, adherence to professionalism principles is crucial in the process of interprofessional collaboration among team members. In the present study, interprofessional professionalism were evaluated in four core domains include altruism, excellence, respect, and communication. The results showed that the status of interprofessional professionalism among members of the surgical team was reported in the below expectations level. Regarding, the role of assessment in forming the professional identity of learners, the IPA as a valid tool could be used in the observational evaluation of interprofessional professionalism among surgical teams in formative and summative assessment.

The assessment of interprofessional professionalism behavior was defined as a multi-dimension and complex subject (7). Consequently, the use of credible observation tool is important in the assessment process (7, 11). The cultural differences between different communities lead to the assessment of psychometric and contextualization of tools, which developed in different environments, is essential for use in other countries (13). Attention to the process of translation and cultural adaptation of meanings is necessary to maintain validity and reliability of tools (13). The validation process is vital in subjects such as professional behavior that is based on norms and values of communities. Consensus methods such as focus group and Delphi technique were recommended in psychometric process (14). In the present study, the Delphi technique was used to ensure the content and face validity of the tool in viewpoints of experts in different professions. The results of content validity indices confirm the validity of the tool. The internal consistency of the tool was confirmed in Cronbach's alpha of 0.96, which is similar to the results of Frost study (7).

In recent decades, the capabilities of interprofessional collaboration and professionalism were described as core competencies (3, 5). Interprofessional Collaboration among team members is also recognized as a vital resolution in developing an optimal care plan, providing team-based services and clarifying ambiguous information in delivering the health care services (1). The results showed that the mean scores of interprofessional professionalism among participants were assessed in the below expectations level. The present results may achieve due to the weakness of the education and evaluation system, as well as the lack of feedback mechanisms regarding professional behaviors among team members in the investigated environment. In addition, the dominance of hierarchical approaches and discrimination across disciplines in educational systems at X context could be effect on the present findings. Interprofessional discrimination has been identified by nurses as the most important challenge in interprofessional collaboration and teamwork in Valizadeh study (15). Likewise, Vafadar et al. defined the hierarchical and individualistic approach as interprofessional collaboration challenges (16). The challenges may effect on the adherence of professionalism principles in the context. It is recommended to conduct qualitative studies to explore the causes and challenges associated with team members' adherence to interprofessional professionalism behavior.

Excellence is an important component of professional behavior that plays an important role in the personal and professional development in health care teams (17). Excellence focuses on through effective reflection, feedback seeking, and self-evaluation (17). In the domain, the use of evidence and expert opinions in decision-making processes has been taken into consideration, regardless of the hierarchical view of individuals and their careers (7). The results showed that the lowest scores among the participants were related to the excellence domain. The residents' scores were reported significantly higher than those of the other professions, although their scores were categorized in the below expectations level. The results may achieve due to the weakness of formal or informal educational program that addressed to the competencies such as collaborative decision-making, interprofessional collaboration and professional behavior in the residency and continuous educational program. The results of Sprung et al. study showed that awareness of the attributes of excellence can help learners and junior physicians recognize the attributes of an excellent physician and strive to achieve them. Likewise, the senior physician encourages becoming a good physician and maintaining their attributions (17). The personal and professional development is introduced as a crucial skills for health care workers (18), although, the present results showed the scores of personals were in the below expectations level. The workloads and time constraints for allocating planned time for personal and professional development programs may effect on the results. In addition, the weakness of awareness, an effective training and support mechanisms for excellence activities can have significant on the consequences. The development of the longitudinal educational program in residency and continuing education were suggested.

The results showed that participants' scores in the domains of communication, respect, and altruism were the below expectations level, and did not differ significantly across disciplines. This may be due to a deficiency of supportive mechanism for adherence to professional principles among learners and staff at the investigated hospital. Developing a value-oriented atmosphere and supportive mechanisms is recommended. Altruism is defined as the ability to go beyond the organizational and professional frameworks and to have a more holistic approach to service delivery (19). Altruism was highlighted on attention, empathy, and understanding of others' needs and values, and demonstrates a level of responsibility for the well-being of individuals (20). In the ​​altruism domain addressed helping team members, compassion and empathy with other health professional, and preference of the patient's (7). Despite high sensitivity and the need for empathic behaviors among surgical team members, the results showed that altruism were not desirable among team members. Prominence on hierarchy, the dominance of the individualistic approach and the weakness in applying the principles of team-based care may effect on the findings. The results of Axelsson’s study showed that developing altruism in interprofessional collaboration is difficult but improvement professionalism in health care systems is vital (19). Healthcare team members need to participate in interprofessional situations and learn from each other and consider differences as an advantage for collaboration (19). Team leaders' attitudes can play an important role in developing altruism (19). It is also important to develop opportunities for communication and interaction among different professions and to build trust between them (5). ​Recognizing the ones’ own professional roles and responsibilities, holding interprofessional meetings, and providing opportunities to reflection on individual roles in the team and accepting team responsibilities can contribute to the development of the altruism among team members (7). Therefore, the establishment of interprofessional opportunities aimed to develop interprofessional relationships should be considered in the surgical departments. Establishing the key infrastructure and developing managerial support to enhance interprofessional professionalism is also recommended.

"Respect for others" was described as one of the six core elements of professionalism and referred to the essence of humanism (20). The mutual respect and trust are the basis for effective interprofessional collaboration (21). The present results showed the scores of respect domain were higher than other domains. However, the scores of participants were reported in the below expectations level. In the ​​respect domain were assessed understanding the cultural differences among different disciplines of health and respecting their values, respecting the views and expertise of team members, recognizing the role and responsibilities of team members (7). Respect is an important factor in effective communication and interprofessional collaboration (5, 14). Respectful behavior, respect for the dignity and professional dignity of members, as well as respect for the role and abilities of others lead to effective interprofessional relationships (14, 22). The results of Heshmati’s study showed the status of the respectful behavior among personnel and physicians in operating room were reported in the highest level (23) that differs from our results. This difference could be due to the atmosphere of the departments, the stereotypes of participants, and the behavior of formal and informal managers in surgical teams at the investigated context. Developing communication skills and establishing a value-oriented atmosphere among members of the healthcare team was suggested to growth of team-based service delivery.

Communication has been introduced as one of the essential capabilities of interprofessional cooperation (22). Communication skills play an important role in achieving effective interprofessional collaboration in surgical situations (24). The domain addressed working with other members of the health team, communicating effectively, listening actively to the opinions of other team members, responding appropriately to questions and requests from other members, and respectful communication (3). The present results reported poor communication of participants. Similarly, the findings of Shokri et al. study showed that half of the nurses believed the professional relationship between physicians and nurses were undesirable (25). In the Rostami study, the relationship between physician and nurse is reported in moderate level. Weakness in communication is one of the challenges of interprofessional collaboration (26). In the Hu et al. study showed communication failures often occur every seven to eight minutes in the operating room (27). Jayasuriya showed professional power, hierarchy, and paternalistic approach identified as a barrier to communication between residents, nurses, and other professionals (28). It is suggested the elimination of communication barriers within and between professional groups to prevent side effects in the operating room. Weaknesses training and assessment of communication skills and the dominance of physician-centered approach may lead to low scores of participants in this domain. Effective communication and understanding of the role and responsibility of professionals were recognized as the two key competencies in the process of interprofessional collaboration (22). Difficult and stressful conditions in the surgical and operating room divisions increase the need to learn effective communication skills, stress management and adherence to the principles of professionalism among members of the surgical team. This requires planning longitudinally and exploring communication challenges in interprofessional meetings.

**Limitation**: The limited sample size and performance evaluation of individuals in a teaching hospital restricted the generalizability of results. Longitudinal studies and assessing the professional behavior among learners and staff overtime are recommended. In addition, qualitative studies are suggested to explore of the reasons of professionalism challenges among team members in surgical departments.

**Conclusion**

The present results showed the status of interprofessional professionalism behavior among participants in different disciplines were in the below expectations level. Regarding, the surgical care in the operating room is high stakes, it is suggested to develop supportive mechanism and interprofessional educational system to achieve the goal of interprofessional professionalism in health care systems.

**Conflict of interest**

The authors declares that there is no conflict of interest.

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