Original Article

Communication apprehension and level of anxiety in the medical students of Rafsanjan University of Medical Sciences

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Abstract:

BACKGROUND: Communication apprehension (CA) is the fear or anxiety about communicating. This study was designed to investigate the CA and its related factors in the medical students at Rafsanjan University of Medical Sciences (RUMS).

MATERIALS AND METHODS: In this cross-sectional study, personal report of CA (PRCA-24) was administered to 340 medical and paramedical students to measure anxiety in four domains of large groups, small groups, public speaking, and dyadic interaction. Pearson's correlation and linear regression analysis were used to investigate the relationship between CA and the variables of birth order, number of siblings, and university entrance score. Data were analyzed using descriptive and inferential statistics (Chi-square and Kruskal–Wallis Test).

RESULTS: CA in the dimension of public speaking was higher than the other dimensions. Evaluation of the economic stability and its relationship to CA indicated a significant difference among all the domains of the PRCA-24. There was a significant relationship between the scores of CA and the number of siblings ($P = 0.001$). Linear regression and Pearson's correlation tests indicated a significant correlation between the variables of birth order, number of siblings, and university entrance score. The correlation between the CA with dimensions of group discussion, interpersonal, speaking, and meeting was weak but significant ($P < 0.01$).

CONCLUSION: Without communication, the materialization and development of the human community are not possible. This aspect is more evident and crucial in the healthcare industry. Based on the results of this study, the medical and paramedical students at RUMS have a medium-to-high level of CA. Therefore, it is of utmost importance to detect students with high CA to prevent further communication problems after graduation.

Keywords:

Anxiety, communication apprehension, medical students, personal report of communication apprehension-24 questionnaire

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Introduction

Communication apprehension (CA) is a type of shyness characterized by fear or anxiety about communicating with people; CA has been described as the "the fear or anxiety related to either actual or expected communication with another person or persons."[1]

The field of patient care requires its members to have effective communication with not only their patients but also other physicians and coworkers to provide the optimal patient care, achieve effective medication consumption, and improve health outcomes.[2] Communication is also an essential aspect of quality nursing care.[3] Chard and Makary believe that effective communication helps the patients make a

smoother move through the system and facilitates care processes in the healthcare system and at the same time provides safe patient care.[4] As Emory points out, "The safety of patients during all phases of care depends on optimal communication by the interdisciplinary team." Therefore, healthcare professionals need to acquire knowledge and willingness, find opportunities to provide effective communication with their patients, and have a strong belief in the fact that communication matters.[1,5,6] Communication abilities and high self-esteem determine how a person can interact with others in the environment. Individuals with low self-esteem and CA have a tendency to experience nervousness and anxiety while interacting with others; on the contrary, people with high self-esteem are likely to feel relaxed while interacting with others.[7,8]

It has been reported that students who do not develop effective communication skills may become communication apprehensive professionals.[2] As early as the 1970s, McCroskey and Andersen have warned that students with high CA have lower academic achievement in the traditional interaction-oriented educational systems. They state that even with many opportunities, some students "functionally are unable to communicate because of CA. These students are so anxious about communication that this anxiety interferes with their communication efforts."[7,9] However, ironically, most of the training provided in the medical schools involves technical skills and theoretical education; communication skills have taken the backseat to medical terminology. Therefore, it is not surprising that upon graduation and entering the job market, the young doctors or nurses' communication skills are put to test. At this time, they may also be negatively viewed within their medical environment.[2] Recent studies have indicated that even students in their nursing education programs are not equipped with communication skills.[3] In a study by Berkow *et al*., two-thirds of new graduates ($n = 3265$) were rated as less than "competent with interdisciplinary communication skills."[10] Navaz and Banu in their study regarding Sri Lankan students found out that >90% of the students experienced a form of anxiety in their classes. They concluded that this anxiety was more distinct during oral tests and in-class presentations.[11]

Considering the fact that we are discussing medicine-related fields, lack of communication skills, or CA, could in the long run have a significant negative impact on the patient care; even in the future, credibility of the young doctors and nurses may be questioned by the patients. To equip the next generation of graduates with this skill, many nursing and medical field programs have tried to seek, develop, and teach effective interprofessional communication, but acquisition of communication skills can be difficult for some students. Lang *et al*. point to one of the criticisms of modern medical education in the United States which tends to isolate young physicians, and especially surgeons, from the general population through important years of adult social development. They believe that "young physicians tend to socialize with other physicians who share similar schedules and academic backgrounds,"[12] and this separates them from the rest of the society. They also report that in this regard, public speaking is consistently listed as one of the greatest fears of the American people. Beardsley too believes that medical universities must ensure that their students develop the knowledge and skills necessary to communicate effectively.[13] In this regard, Blume *et al*. have reported that nursing students often experience fear, anxiety, and negative attitudes during communication with their patients which may be the result of CA.[14] Taking again into account anxiety toward communication situations, McCroskey claimed that to understand the consequences of CA, researchers need to pay attention to all the causes involved in anxiety arousal situations.[7] According to McCroskey and Richmond, oral communication is an act of volition, meaning that people voluntarily choose to communicate.[15] It is important to note that as people physically and psychologically are different from one another, they show different degrees of oral communication skills. As MacIntyre states, while some people tend to speak only when they are forced to, some others seem to be verbose and talk regularly.[15] MacIntyre *et al*. point out that five central determiners are predictive of effective communication or willingness to communicate; they include social situation, participants, setting, purpose, topic, and the channel of communication.[13,16] Furthermore, individuals repeat nonverbal behavior and communication according to their own methods, and these are influenced by the cultures that they have inherited. As a result, cultural diversity appears between countries.[17]

Currently, in the Iranian medical universities, there are no mandatory communication skill courses offered. Therefore, the students must either possess this skill or learn it on their own. Although there are courses which promote group work, oral presentations, or patient stimulation laboratory, these efforts seem not to be enough for the future interaction with the patients. The purpose of this study was to investigate the self-reported measures of CA and its related factors in the medical students in four specific anxiety-provoking communication contexts: public speaking, dyadic interaction, small groups, and large groups and its possible related factors at Rafsanjan University of Medical Sciences (RUMS). Similar studies have been conducted in Iranian schools; however, to the best of our knowledge, not a study in this scale has been conducted on medical students. The subjects of previous studies in this field have been

second-language learners or the studies have been carried out on one group of students.

Materials and Methods

In this observational, cross-sectional quantitative study, a two-part questionnaire consisting of demographic information (for possible correlation) and the personal report of communication apprehension (PRCA-24) was distributed among 340 medical and paramedical students at one large medical university in the southeast of Iran. The PRCA-24 is a scale designed to measure one's fear associated with either real or anticipated communication in four different contexts, which was devised by McCroskey in 1972 and underwent several revisions in 1978 and 1982. However, the latest version of the scale – the PRCA-24 – is claimed to be content valid, internally consistent, and highly reliable. A study carried out by McCroskey *et al*. in 1985 provided substantial support for the effectiveness of the instrument. Therefore, PRCA-24 is one of the most valid and still widely used scales to measure trait-like CA, namely the permanent feeling of apprehension toward communication occasions, which characterizes the individual. McCroskey developed its last version in 1982 to investigate the origin of difficulties many people experience when they try to communicate with each other. Since it is a self-rating questionnaire, individuals may assess their own level of CA and see how nervous they are when they communicate. It has also been reported that "the instrument helps the respondents to think about developing strategies for coping with personal CA by clarifying the foundations of it." This instrument is designed not only to measure overall anxiety but also to allow respondents to examine their relative degree of apprehension between and among four specific anxiety-provoking contexts of public speaking, dyadic interaction, small groups, and large groups (1). McCroskey reports that the PRCA-24 has very high predictive validity and is highly reliable ($\alpha > 0.90$). The scale uses five-point Likert items, ranging from 1 ("strongly disagree") to 5 ("strongly agree"), and it may be overall scored by adding up the rating of the 24 items, or it can be computed separately for each context. Table 1 presents the scoring formula of the PRCA-24.

Table 1: Scoring formula of the personal report of communication apprehension 24 (McCroskey, 1982:23)

Subscores	Scoring formula
Small groups	18+ scores for items 2, 4, and 6; −scores for items 1, 3, and 5
Large groups	18+ scores for items 8, 9, and 12; −scores for items 7, 10, and 11
Dyadic interaction	18+ scores for items 14, 16, and 17; −scores for items 13, 15, and 18
Public speaking	18+ scores for items 19, 21, and 23; −scores for items 20, 22, and 24

However, as McCroskey warned, these subscores are less reliable than the total PRCA-24 scores ($\alpha > 0.85$), due to the reduced number of items.

Overall scores range from 24 to 120, and based on McCroskey's instructions, scores below 51 indicate a very low CA level, between 51 and 80 represent the average CA level, and scores above 80 correspond to individuals with a high level of CA (McCroskey, 1982). The 24 items were translated and given to the freshmen students of different majors at RUMS.

The students in this study were randomly selected from different faculties of medicine, dentistry, nursing, midwifery, laboratory science, radiology, and heath. All the participants were informed of the confidentiality and the ethical committee approved the study, and to conduct the study, the ethical code (IR.RUMS.REC.1395.121) was obtained from the research committee at RUMS. After collecting the data, we used descriptive and inferential statistics of Chi-square test and independent *t*-test. $P < 0.05\%$ was considered statistically significant.

Results

This study was conducted on 340 medical and paramedical students from RUMS. Among them, 7.1% (24) were dentistry, 6.5% (22) environmental health, 2.7% (9) general health, 44% (148) medical students, 6% (20) operation room, 7.1% (24) laboratory sciences, 11.6% (39) anesthesiology, 7.4% (25) radiology, and 7.4% (25) nursing students. Four students had not indicated their majors. 68.1% (226) were females and 31.9% (106) were males. Eight students had not answered this item. 51.2% (172) were doing their doctorate degrees, while 47.7% (164) were studying for bachelor's degrees. 64.11% (218) of the students in this study were considered natives of Kerman province in the South East of Iran. The majority of them (n 309 = 93.6%) were single, and 47.1% (154) reported their good and stable economic situation in the families and had not experienced any harsh financial problems while growing up. 11 students (3.2%) were the offspring of Martyrs or war veterans of Iran–Iraq war and had enjoyed a subsidy for acceptance into the university. Twenty percent (68) of the students had not reported their university state subsidies.

Evaluating the results of the study indicated various degrees of CA and therefore anxiety for the participants. Overall, the scores for the mean and standard deviation of PRCA-24 questionnaire were 68.64 ± 4.89. Based on the scoring system of the PRCA-24, the scores from 51 to 80 indicate an anxiety level and CA of medium level.

Considering the four areas of the PRCA-24, the mean and standard deviation of the students in the dimensions

of public speaking were 34.77 ± 2.34, in small group discussion 20.90 ± 4.75, dyadic interaction 19.95 ± 4.57, and in large groups 19.82 ± 4.82, respectively. Because scores above 18 are an indication of some degrees of apprehension, the results showed that CA in the dimension of public speaking was higher than the other dimensions.

As to the items of the questionnaire, the item: "I dislike participating in group discussions" with the mean and standard deviation of 2.24 ± 1.07 received the lowest score which means that the majority of the students liked to participate in group discussions and showed no apprehension in this regard. The items "I am tense and nervous while participating in group discussions" and "Engaging in a group discussion with new people makes me tense and nervous" with the mean and standard deviation of 2.27 ± 0.88 and 2.47 ± 0.95 got the lowest scores, respectively, which again indicates that the students have no anxiety when participating in group discussions. On the other hand, the items "I like to get involved in group discussions," "I am calm and relaxed while participating in group discussions," and "I have no fear of speaking up in conversations" with the 3.35 ± 0.98, 3.75 ± 0.94, and 3.34 ± 1.05 got the highest scores, respectively, which means that again the students had agreed with these items and indicated no fear of stating their opinions in the contexts of meeting and small groups. Therefore, the results indicate that the studied population had a medium level of anxiety.

Table 2 shows the communication apprehension of the students based on their demographic information.

There was no significant difference between the scores of PRCA-24 and the studied factors of the year of entrance to the university ($P = 0.136$), birth place ($P = 0.994$), birth rank ($P = 0.985$) economic background ($P = 0.382$), and current place of living ($P = 0.323$), but a significant relationship was observed between the scores of CA and the number of siblings ($P = 0.001$), which means that the students born in the families with more children had lower levels of CA.

In this study, to investigate the relationship between the variables of birth order, number of siblings, and university entrance score, we used Pearson's correlation and linear regression analysis. Linear regression test about the quantitative variables indicated that there was a significant correlation between CA and the number of siblings ($P < 0.01$) (CA predicting score of = 0.001* [number of siblings] - 61). Moreover, there was a significant correlation between CA and birth order (CA predicting score of = 1.058* [birth order] - 60). Further, there was a significant correlation between CA and high school grade point average (GPA) (CA predicting score of = 0.001* [GPA] - 75). The results also showed that here was a significant correlation between CA and university entrance score (CA predicting score of = 0.000 46* [university entrance score] - 60). As to the correlation between CA and the dimensions of group discussion, interpersonal, speaking, and meeting, we found a weak but statistically significant difference ($P < 0.01$).

The radiology students had the highest level (70.04 ± 5.41) and the general health students had the lowest rate of the

Table 2: The overall evaluation of communication apprehension of the students based on demographic information

Field	Communication anxiety			P
	Severe, *n* (%)	Moderate, *n* (%)	Low, *n* (%)	
Dentistry	1 (4.2)	23 (95.8)	0 (0)	0.835
Environmental health	0 (0)	22 (100)	0 (0)	
General health	0 (0)	8 (100)	0 (0)	
Medicine	3 (2)	143 (97.3)	1 (4.2)	
Surgical technology	0 (0)	19 (100)	0 (0)	
Medical laboratory	0 (0)	23 (95.8)	1 (4.2)	
Anesthesiology	0 (0)	37 (100)	0 (0)	
Radiology	1 (4.2)	24 (96)	0 (0)	
Nursing	0 (0)	25 (100)	0 (0)	
PhD	4 (2.3)	166 (97.1)	1 (0.6)	0.442
BS	1 (0.6)	158 (98.8)	1 (0.6)	
Female	2 (0.9)	219 (98.2)	2 (0.9)	0.25
Male	3 (0.9)	101 (97.1)	0 (0)	
Single	5 (1.6)	298 (97.7)	2 (0.7)	0.791
Married	0 (0)	20 (100)	0 (0)	
University acceptance subsidies				
Zone 1	0 (0)	22 (100)	0 (0)	0.001*
Zone 2	0 (0)	154 (99.4)	1 (0.5)	
Zone 3	3 (3.7)	78 (96.3)	0 (0)	
Children of War Veteran's	2 (18.2)	9 (81.8)	1 (0.3)	

*significance level is 0.05

CA (65.87 ± 4.39), but this difference was not statistically significant. Evaluating the questionnaire indicated that medical laboratory students had the highest CA in the small group discussion context, while the nursing students had the lowest score in this field; however, this difference was not statistically significant. Comparison of the other three dimensions revealed no significant difference. As Table 3 shows, the CA scores of the students were in the medium range.

Evaluation of the genders and marital status indicated a higher level of apprehension among the male students over the females and single students over married students, respectively; however, Kruskal–Wallis test did not show a significant difference between the studied groups in these factors. The comparison of the mean and standard deviation of the overall scores and its

dimensions of the PRCA-24 are shown in Table 4, based on gender and marital status.

Evaluating the economic and financial stability and its relationship to CA indicated a significant difference among all the dimensions of the PRCA-24. The results showed that surprisingly, students in lower economic classes and blue color ones had lower CA level as compared to the financially stable and white color middle class students [Table 5].

Five percent[17] of the students reported to be dropout students, and the Kruskal–Wallis test showed a higher level of CA among these students in the interpersonal dimension ($P = 0.019$), but there was no significant difference in the CA scores in other dimensions of PRCA-24.

Table 3: The mean and standard deviation of personal report of communication apprehension 24 and its measurements based on the majors and fields of study

Field	PRCA-24, mean±SD				
	Small group discussion	Large group	Dyadic interaction	Public speaking	Overall CA
Dentistry	21.12±3.66	20.62±4.69	20.50±4.76	19.95±3.57	69.87±4.22
Environmental health	20.77±6.38	20.00±6.76	20.00±5.66	18.64±5.40	68.73±5.32
General health	20.77±4.89	19.87±5.72	18.44±5.00	18.33±4.79	65.87±4.39
Medicine	21.04±5.14	20.00±4.89	20.22±4.71	19.05±4.59	68.33±4.80
Surgical technology	20.80±4.66	19.65±3.73	19.60±3.73	18.95±4.05	69.42±4.23
Medical laboratory	21.50±3.00	20.54±3.32	20.66±2.71	19.91±3.68	66.83±7.24
Anesthesiology	20.56±4.26	19.05±5.09	19.69±4.48	19.02±4.06	68.97±3.51
Radiology	21.04±4.19	19.32±4.60	19.52±5.22	18.68±4.51	70.04±5.41
Nursing	20.52±4.89	19.60±3.49	19.36±3.89	19.48±3.18	69.32±4.59
P	0.999	0.834	0.813	0.885	0.239

CA=Communication apprehension, PRCA=Personal Report of CA, SD=Standard deviation

Table 4: The mean and standard deviation of personal report of communication apprehension 24 and its measurements based on gender and marital status

Variables	PRCA-24, mean±SD				
	Small group discussion	Large group	Dyadic interaction	Public speaking	Overall CA
Sex					
Male	20.60±4.30	19.73±4.43	20.09±4.62	19.04±4.43	68.93±4.60
Female	21.05±4.94	19.93±4.93	19.94±4.51	19.15±4.19	68.46±5.08
P	0.992	0.797	0.671	0.480	0.686
Single	20.92±4.70	19.81±4.83	19.95±4.58	19.10±4.24	68.27±4.96
Married	21.33±4.29	20.57±3.80	20.67±3.58	19.85±4.29	68.20±4.17
P	0.455	0.456	0.555	0.335	0.738

CA=Communication apprehension, PRCA=Personal report of CA, SD=Standard deviation

Table 5: The mean and standard deviation of personal report of communication apprehension 24 and its measurements based on economic background of the students

Economic status	PRCA-24, mean±SD				
	Small group discussion	Large group	Dyadic interaction	Public speaking	Overall CA
Being financially stable (while color)	21.01±4.66	20.07±5.18	20.21±4.69	19.50±4.34	68.41±4.93
Having limited financial problems	21.03±4.65	19.81±4.40	20.00±4.33	18.94±4.24	68.89±5.08
Having difficult financial background and Financially unstable (blue color)	16.25±5.48	16.50±4.01	16.08±4.71	15.92±4.44	67.91±2.87
P	0.014*	0.035*	0.021*	0.025*	0.683

*P value is significant. CA=Communication apprehension, PRCA=Personal report of CA, SD=Standard deviation

As to the family size, overall, the CA level was shown to be lower in the students growing up in larger families than those with smaller families. In the area of large group, the CA level was lower in the students who had grown up in larger families compared to smaller ones, and this difference was statistically significant ($P = 0.012$). Table 6 shows the mean and standard deviation of the students with university entrance subsidies.

Discussion

This study investigated the self-reported measures of CA and its related factors on the medical and paramedical students at RUMS in the domains of public speaking, dyadic interaction, small groups, and large groups. The results indicated a medium level of anxiety among the students (68.64 ± 4.89). There was no significant relationship between the CA level and the university contexts with different majors, which means that studying in a so-called more prestigious major such as medicine or dentistry had no effect on the level of CA. On the contrary, students studying in majors such as general health indicated lower levels of CA.

Evaluating the questionnaire in this study indicated that medical laboratory students had the highest CA in the small group discussion context, while the nursing students had the lowest score in this field; therefore, it could be concluded that because nursing students have mandatory journal clubs and need to present and have discussions in these meetings, they have developed small group discussion skills and have no fear of expressing themselves. However, in a recent study on the nursing students, LaRochelle and Karpinski found that as CA increased, interpersonal and socialization skills of the nursing students declined.[18] Wagner *et al.* found that CA can be a factor influencing the nursing students' interactions with patients and groups.[19]

There was a significant relationship between the scores of CA and the number of siblings ($P = 0.001$), which means that students born in larger families reported to have lower levels of CA. This, of course, could be due to the level of interactions between siblings, while growing up or having had to speak up and fend for themselves in their families. Evaluating the genders and marital status indicated a higher level of apprehension among the male students over the females and single students over married ones, respectively. However, as Fich, Kimmel, and Fairchild indicate, men and women are "different in communication process in variables such as word choices, conversation style, content of speech, purpose of conversation, purpose of the questions, use of silence, style of listening and speaking, change of subject, interruption of the speech of others, and encouragement of the continuation of the conversation." In this study, however, Kruskal–Wallis test did not show a significant difference between the male and female groups in the dimensions of gender and marital status.[20] In this university, all the students enjoy state subsidy dormitories, and each student lives in a six-bedroom flat with five other students studying different majors; there are a limited number of dormitories available for the married students. These students provide accommodation of their own and are on the waiting lists for the married students dormitories. Our study showed that the married students had higher levels of anxiety and CA. One possible explanation could be the stresses of married life and lack of enough interactions with other students or lack of participation in small and large group discussions, due to more responsibilities and burdens on their shoulders.

In the Iranian state universities, there is a subsidy awarded to the children of war veterans and martyrs, which means that these students are granted a portion of university seats (5%). In addition, different geographical zones have their own subsidies. Capital and industrial cities such as Tehran, Shiraz, and Isfahan are considered zone 1, while smaller cities are among zone 2 and 3. Cities located in zone 3 generally have populations with lower economic status and lesser educational privilege such as private schools and lower educational funding. The results of the study indicated the highest levels of CA. Their score of PRCA-24 was 72.54 ± 5.63 which, according to McCroskey *et al.*, indicates a high level of anxiety and CA.[7] Considering the fact that the students form this zone are as hard working as those belonging to zones 1 and 2, we could come to the conclusion that hard work and being accepted in a state-funded university do not guarantee communication skills but show that they

Table 6: The mean and standard deviation of personal report of communication apprehension 24 and its relationship to the university entrance subsidy

University acceptance subsidies	PRCA-24, mean±SD				
	Small group discussion	Large group	Dyadic interaction	Public speaking	Overall CA
Zone 1	23.63±4.23	22.14±4.27	23.00±3.12	20.68±4.19	68.59±3.99
Zone 2	20.80±4.74	19.83±4.75	19.95±4.60	18.33±4.20	68.57±4.28
Zone 3	21.24±4.60	19.96±4.84	20.21±4.44	19.63±4.25	68.53±5.64
Children of war Veteran's	22.27±5.53	20.82±6.03	20.18±5.80	19.90±5.28	72.54±5.63
P	0.061	0.225	0.036*	0.334	0.166

*P value is statistically significant. CA=Communication apprehension, PRCA=Personal report of CA, SD=Standard deviation

have had to work twice as hard as the other students and overcome the obstacles of life in a small city, but moving to a larger city has brought with it higher and new communication anxieties for them which must be dealt with.

Evaluating the economic and financial stability and its relationship to CA indicated a significant difference among all the dimensions of the PRCA-24. The results showed that surprisingly, lower economic class students and blue color students had a lower CA level compared to the financially stable and white color middle class students. This is in line with the study of Lang and Rowland-Morin.[12] Again, we could conclude that these students have had to stand up and fight for their rights more than the privileged students and might have developed communication skills. On the other hand, Mohammadi *et al.* report that "certain groups of the population, especially those with low socioeconomic status, live and work in inappropriate environments and as a result are exposed to higher disease in risk factors as well as physiological effects of chronic stress."[21]

In this study, the students indicted lower levels of anxiety regarding the participation in small group discussions which is in line with the study of Cetinkaya, who found that individuals in his study preferred to talk in groups rather than engage in public speaking.[22]

According to Deardoff[23] another factor involving CA is cultural differences; a person's willingness to communicate with other people of similar cultural background is higher compared to people with different cultures and backgrounds. Some of CA anxiety in this study could be related to the factor that university students in Iran all come from different backgrounds and ethnicities and even different accents, so they find it intimidating and troublesome when communicating with others.

In the research on CA, a high CA has been linked to a variety of academic and social behavioral patterns. For example, persons with high CA drop classes that require speaking, avoid seating patterns that are points of interaction, self-disclose less, and select occupations that require less communication.[24] In addition, Faridizad and Simin found that students with high levels of oral CA and perceived face threats tend to have a lower frequency of class participation.[25] Studies by Richmond and Roach have shown that in organizations, the way a person is perceived may be more influential than his/her actual levels of intelligence, skill, and performance. They argue that people who are less willing to communicate have lower levels of job satisfaction.[26] Mejías *et al.* also have pointed out that students often do not have adequate knowledge or they lack the necessary skills to perform

successfully in oral communication situations; therefore, their poor performance will in the long run negatively affect their anxiety level.[27]

Blume *et al.* have warned that high level of CA can have an effect on a nurse's efficiency, willingness, and ability to interact with others in critical situations and may result in avoiding contact with patients or other health professionals.[14] They argue that students with higher CA may choose to avoid interpersonal interaction experiences, and when those students did interact in discussions, the amount of time in these interactions was much lower than their classmates with lower CA scores. Thus, in the long run, the CA and communication avoidance can lead to lower health outcomes and poor patient satisfaction.[18] Among the most powerful evidence on the subject of CA within the last 30 years was the study of Allen and Bourhis. They investigated 36 studies on the subject of CA and reported that CA scores negatively correlated with both the quality and quantity of communication interactions, meaning that the higher the CA score, the lower the quality and quantity of performance.[28] This finding is of great importance in the field of healthcare. As the students in this study suffer from medium levels of CA, paying attention to the causes of this level of anxiety in the communication process needs thorough investigation. Clearly, students should be encouraged to consider ways and strategies to manage their own apprehension. As Latha *et al.* point out, in the today's world, social media is emerging as a powerful tool in education; therefore, using this medium is one way to enhance communication among the medical and paramedical students.[29] Furthermore, it is important for the students not to be ashamed and hide their apprehension, but they should be able to discuss this lack of skill with their teachers and peers. Of course, the role of guidance cannot be denied in this way; as Bazrafkan *et al.* in a study on management of stress and anxiety in 2016 emphasize, students "experience stress and anxiety from a variety of sources and apply different methods of coping in effective and ineffective ways. Purposeful supervision and guidance can reduce the cause of stress and anxiety."[30]

It should be mentioned that there were some limitations in this study. As this study utilized a self-report questionnaire, some students were reluctant to answer the items that they felt were personal and probably feared exposure or embarrassment; therefore, some items were left blank by them. Furthermore, "despite the emphasis from the researchers, some students did not take enough care in responding to the items, and it seemed that their replies were hasty and without enough thought. In recent years, as the female students have become more prominent in the state universities, their numbers have also increased, and the ratio of male and

female students has skewed toward the female students. Therefore, the number of male respondents was much lower than the female ones, so we could not make a reliable comparison between the genders.

Conclusion

To prepare the next generation of graduates with communication skills, medical and healthcare programs need to develop and teach effective interprofessional communication. However, communication can be difficult for some students. To make learning more experiential and practical, there is a need to increase the students' exposure to public speaking and group discussions. There should certainly be a strong mentoring system in which every student has a dedicated mentor to help and guide them on the communication skills. They should create a thirst for learning and acquiring communication skills in each young and aspiring mind. Since the medical programs in Iran do not require interviews for admission, it is of utmost importance to detect medical graduates with high CA and plane education programs and workshops to help them overcome their communication anxiety to prevent further problems after graduation. Of course, early detection would also be cost-efficient as groups of students could be taught at the same time. This study is considered a pioneer study on identifying the level of students' CA at medical university level in Iran. It would, therefore, be useful to carry out similar studies at different universities in the country to establish the role of CA in future medical graduates.

Conflicts of interest
There are no conflicts of interest.

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