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Validation of Groningen Reflection Ability Scale Questionnaire and Evaluation of Reflection Ability Level of Health Care Management Students

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ABSTRACT

Background: Reflection has been extensively used in different areas for better thinking about previous experiences and reaching to new behaviors, which leads to an improvement in personal skills and knowledge. Reflection ability is one of the most essential competencies for healthcare professionals and medical students, which is emphasized in several medical courses and references. This ability is improved with practice and repetition. Therefore, reflection in medical education is very important. Thus the aim of the present study was evaluation of reliability and validity of the tool for assessing this skill and determination of reflection ability level of health care management students.

Methods: The present descriptive and cross-sectional research, performed in two phases. The study population were 30 students of health care management. In the first phase, after the translation of the questionnaire, the reliability and validity of the questionnaire was determined. In the second phase and for evaluation of reflection ability level in health care management students, the Groningen Reflection Ability Scale questionnaire was completed by students and data analyzed with independent t-test and Pearson correlation statistical tests.

Results: The reliability and validity of the questionnaire were confirmed (Cronbach's alpha = 0.73). The reflection ability score of students was 82.13 ± 4.24. After a statistical analysis of data among genders, although the reflection scores of males (83.58 ± 4.37) were higher than females (81.17 ± 3.97), but this difference was not statistically significant (P-value ≥ 0.05). Also, the difference between demographic variables and reflection ability scores was not statistically significant (P-value ≥ 0.05).

Conclusion: This study showed that the GRAS questionnaire is a useful tool for assessing the reflection ability and students have medium scores of reflection ability so educational managers should pay serious attention in planning related fields.

Keywords: Validity; Reliability; Reflection, Reflection ability

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Introduction

In recent years, reflection has been introduced as an essential skill for learners in different fields (1, 2). John Dewey (1933) defined reflection as a process in which the person first faces an issue, and then defines it, identifies possible solutions, hypotheses and observes and experiences to see if the preliminary findings are correct or not (3, 4). In other words, reflection is thinking about previous experiences and it is aimed at producing new knowledge and attaining new behavior (5, 6). Reflection is also known as the main educational method, which in clinical situation improves individuals' skills and knowledge (7). In recent years, different methods have been introduced for reflection, which have a significant impact on the process of reflection and its training. One of the practical models for reflection is reflective cycle of Gibbs. In this model, the learners think and reflect on a cycle. The cyclic nature of this model leads to people constantly reviewing their experiences and better perception of their experience. In this model, the learner responds to six questions in a cyclic process:

1. What happened?
2. What were your feelings and thoughts?
3. What were the positive and negative aspects of the experience?
4. What did you learn from this situation?
5. What other things could you do?
6. If it happens again, what will you do? (8)

To facilitate reflection, several methods are introduced which include: writing diaries, describe personal narratives, portfolio (9), critical incident report (10), narrative reflection (11), oral or written practice with new media like recording your voice, weblog, digital quotation, using multimedia tools (Simultaneously using of audio, photo and video), painting, photography and sculpturing (1). But the best method is depended on educational facilities and conditions (12).

The reflection process provides a good opportunity for learners to learn effectively (13). Individuals could identify their learning requirements through the reflection process (1, 14, 15). With deeper thinking about the experience, the individual will be aware of the strengths and weaknesses of his or her performance (16) and improves clinical reasoning (17), problem-solving (13), communication with colleagues (18), professional performance (1, 19) and managerial competencies (1, 19-21), which ultimately leads to easier decision making in complex and conflict situations (1, 9-11).

Based on our knowledge, reflection ability level was not evaluated in the studies conducted in Iran and all of those studies just provide a definition of it and its affecting factors (22-25). However, in the study conducted by Sholikhah et al. (25) the reported reflection ability score was 89.59 and dock et al. (26) suggested that reflection ability was significantly improved following an educational intervention.

Reflection education must be considered in learners like the healthcare team because, in the future of their careers, they have to deal with problem or decision making in different situations (27). This is very important for health care management students that decision-making is defined as one of the bases of their field (28). Any decision in this filed could affect different parts of society and the environment (29). The aim of nurturing health care management students is developing individuals who make the right decisions in critical situations. Based on the importance of reflection ability level of learners in educational planning with the aim of developing this skill among learners, the present study was performed to determine the level of reflection ability level among health care management students. This skill is one of the most essential competencies for students which could be acquired during their courses.

Materials and Methods

The present study was a descriptive research, which performed in two phases during the second semester of 2018-2019 among health care management students in Iran, who completed the questionnaire. In the first phase, after the translation of the questionnaire, the reliability and validity of the Groningen Reflection Ability Scale

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(GRAS) questionnaire was determined. In the second phase, the reflection ability level in health care management students was determined via GRAS questionnaire.

First phase

In order to determine the reliability and validity, the GRAS questionnaire (30) was translated by three English to Persian translator experts. The translations were reviewed and a questionnaire was finalized by consensus of the translators. In the next step, the translated questionnaire was translated from Persian to English by two expert translators and the final version of the questionnaire was confirmed (Figure 1).

The face validity of the questionnaire, leads to the improvement of an individual's desire for participating and responding (31). For the face validity of the questionnaire, it was administered to 15 health care management students (12 M.Sc. and 3 Ph.D.) and 18 authorities (10 healthcare management managers, 3 health education managers and 2 staff managers of Shahid Sadoughi University of Medical Sciences, Yazd-Iran). The research team was focused on the writing and appearance of the questionnaire sentences so that individuals were required to identify "relation", "simplicity" and "clarity" of each question based on a 4-point Likert scale (a. completely related to b. relevant c. requires substantial modification and d. completely irrelevant). In order for an item to remain unchanged, 50 percent of respondents must select option "a" or 70 percent of them must choose option "a" or "b", otherwise the appearance of the item needed to be corrected.

In order to determination of the Content Validity Ratio (CVR), based on the method described by Lawshe (31), the necessity of the questionnaire items was checked through a likert scale of three (a. absolutely necessary b. not necessary but useful c. completely unnecessary). At the end, after the collection of 12 questionnaires and calculation of CVR index via equation 1, the necessity of questionnaire items was evaluated.

Equation 1. Content validity ratio calculation

$$CVYR = \frac{n_e - \frac{n}{2}}{\frac{n}{2}}$$

Where "n" stands for the number of authorities and "n_e" is the number of authorities which select absolutely necessary for questionnaire items. According to the number of authorities in the Lawshe table, the minimum CVR was 0.56 and items with CVR ≥ 0.56 were retained.

Content Validity Index (CVI) is the mean of questionnaire items' CVR. The CVI indicates the applicability of the final questionnaire. In the higher number of CVR, CVI was close to 0.99. CVI calculated through equation 2, where the fracture denominator is the number of retained items.

Equation 2. Content validity index calculation

$$CVI = \frac{\sum_n^1 CVR}{retained\ items}$$

Reliability is a measure of the consistency of the questionnaire results under similar conditions. In this study, the reliability of the questionnaire was determined by calculating of 25 completed questionnaire Cronbach's alpha. The Cronbach's alpha ≥ 0.7 considered standard for the instrument.

Seconded Phase

In this research, the GRAS questionnaire was sent by E-mail to 40 M.Sc. students of medical healthcare management (Yazd, Iran, Isfahan, Tabriz, Qazvin, Shiraz and Mashhad Medical Universities) in the second semester of 2017-18. Overall, 30 questionnaires were received. Inclusion criteria were studying healthcare management. Incomplete questionnaires were excluded from the study. The designed questionnaire was an instrument for evaluation of reflection ability, which consisted of 23 questions in three categories include: self-reflection (10 questions) (individuals capacity to learn from experiences and events (32)), empathetic reflection (six questions) (the essence of a

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behavior and the motivations behind it, not what is seen) and reflective communication (seven questions; investigating self-behavior with regard to social interactions (33)). This instrument, introduced for the first time by Aukes and colleagues (30). The minimum and maximum scores of this instrument were 23 and 115, respectively. Each question scored according to the 5-point Likert scale (1 for strongly disagree and 5 for strongly agree). 5 questions of the questionnaire had the inverse scoring system (questions of 14, 17, 18, 22 and 23). The total score is the sum of scores of each category. The higher scores indicate a high level of reflection ability (30). In the questionnaire assured individuals that data will be used without disclosing the specifics of individuals.

After collecting questionnaires, Data were entered into $SPSS_{23}$ software. For descriptive analysis of quantitative variables, minimum, maximum, mean and standard deviation indices were used. For descriptive analysis of qualitative variables frequency and percentage, indices were used. For comparison of the total score of the reflection ability between genders independent t-test and for identifying the relationship between demographic variables (grade of semester and age) with reflection ability score, the Pearson correlation coefficient was used.

This study was conducted with a code of ethics IR.SSU.SPH.REC.1397.056 and financial support of Shahid Sadoughi University of Medical Sciences, Yazd-Iran and also was approved by the ethics committee at the National Agency for Strategic Research in Medical Education with the ID of 970137. According to the text at the beginning of the questionnaire, completing the questionnaire was a measure of students' satisfaction with the data used.

Results

First phase

All of 15 questionnaires which were sent to the students were received (response percentage: 100 %), and from 18 questionnaires which send to authorities, 12 questionnaires were received (response percentage: 67 %). The face validity of questionnaire confirmed by the vote of 14 out of 15 students (93.3 %) and 10 out of 12 authorities (83.3 %). With calculation of CVR for questionnaire items, all 23 items were confirmed (Table 1). The range of CVR was 0.666-1. According to the Table 1, the CVI index based on CVR were acceptable. The reliability of the questionnaire based on Cronbach's alpha was acceptable ($\alpha = 0.73$).

Second phase

In the second phase, 40 questionnaires were distributed among healthcare management students and 30 completed questionnaires were received (75 % respond rate). The age descriptive index given by gender was represented in Table 2.

Mean score of reflection ability given by gender and questionnaire categories were represented in Table 3. Comparison of reflection ability score between male and female students with independent t-test analysis was not statistically different (P-value = 0.712). Also, the difference of each question score between male and female students, was not significant (category 1: P-value = 0.556; category 2: 0.116; category 3: P-value = 0.376).

Pearson coefficient correlation was conducted for demographic variables include: age, educational semester and average (Table 4), which statistically was not significant.

With categorizing acceptable range for reflection ability score in low (23-53.5), medium (53.5-84) and high (84.5-115), the mean reflection ability score of students was in medium range.

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Table 1. Psychometric results of Groningen Reflection Ability Scale Questionnaire

Number	Category	Question	CVR	CVI
1	Self-reflection	I review how I'm used to thinking	0.66	0.76
2		I want to know the reason for what I'm doing	0.66	
3		I understand the importance of knowing the rules and the guidelines	0.66	
4		I want to know my own characteristics (attitude, performance, perspective, and personality)	0.83	
5		I am aware of the mentalities that influence my thinking	0.66	
6		I'm aware of the emotions that affect my behavior	0.83	
7		I can examine my behaviors (as a neutral person) remotely	0.83	
8		I evaluate my own judgments about others	0.83	
9	Empathetic reflection	I can examine an experience from different perspectives	0.66	
10		I'm aware of the cultural factors that influence my thinking	0.66	
11		I am aware of the mental effects that possibly different information has on people's (views)	0.66	
12		I can sympathize with someone in a different situation	1	
13		I know my own limitations	0.83	
14		I do not prefer different ways of thinking	1	
15		Sometimes others say that I am exaggerating myself	0.83	
16		I can understand people from different cultures and religions	0.83	
17	Reflective communication	I do not like to discuss my views	0.66	
18		Sometimes I find it difficult to explain an ethical point of view	0.66	
19		I am accountable for what I say	0.66	
20		I take responsibility for what I say	0.83	
21		I am ready to discuss my views and opinions	0.66	
22		I sometimes find it difficult to think of alternative solutions to a problem	1	
23		I don't welcome explaining my personal performance	0.66	

Table 2. Age descriptive index given by gender

Variable	Gender	n	percentage	mean	SD	median	Min.	Max.
Age	Female	18	60	25.67	3.911	26	19	34
	Male	12	40	25.58	4.757	25	20	33
	Total	30	100	25.63	4.189	26	19	34

Table 3. Learner's reflection ability given by gender and categories

	P	Gender	Mean ± SD	Min. acceptable value	Max. acceptable value
Self-reflection	0.556	Female	40.78 ± 3.15	10	50
		Male	41.00 ± 3.07		
		Total	40.87 ± 3.07		
Empathetic reflection	0.116	Female	20.67 ± 1.91	6	30
		Male	21.67 ± 2.64		
		Total	21.07 ± 2.44		
Reflective communication	0.376	Female	19.72 ± 2.46	7	35
		Male	20.92 ± 3.08		
		Total	20.20 ± 2.74		
Total score	0.712	Female	81.17 ± 3.97	23	115
		Male	83.58 ± 4.37		
		Total	82.13 ± 4.24		

P-Value ≤ 0.05

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Table 4. Relationship between demographic variables and reflection ability

	Mean Score Of Reflection Ability	
	Pearson correlation coefficient	P
Average	- 0.107	0.573
Educational Semester	0.194	0.303
Age	0.082	0.665

P-Value ≤ 0.05

Table 5. Groningen Reflection Ability Scale Questionnaire

	Phrase	Totally Disagree	Disagree	Neutral	Agree	Totally Agree
1	I look closely at my thinking habits					
2	I want to know why I'm doing something					
3	I think it's important to know what specific rules and guidelines are based on					
4	I want to understand myself					
5	I am aware of the feelings that affect my thinking					
6	I am aware of the feelings that affect my behavior					
7	I can see my behavior remotely					
8	I test my judgments against others					
9	I can see an experience from different perspectives					
10	I am aware of the effects of cultural factors on my opinions					
11	I am aware of the possible emotional effects of information on others					
12	I can sympathize with someone else's position					
13	I am aware of my limitations					
14	I do not accept different ways of thinking					
15	Sometimes others say that I overestimate myself					
16	I am able to understand people with different cultural / religious backgrounds					
17	I do not like my views to be discussed					
18	Sometimes I find that I'm having trouble describing a moral outlook					
19	I'm accountable for what I say					
20	I'm responsible for what say					
21	I boldly discuss my opinions					
22	I sometimes find it difficult to think about alternatives for a problem					
23	I do not welcome criticisms about my personal performance					

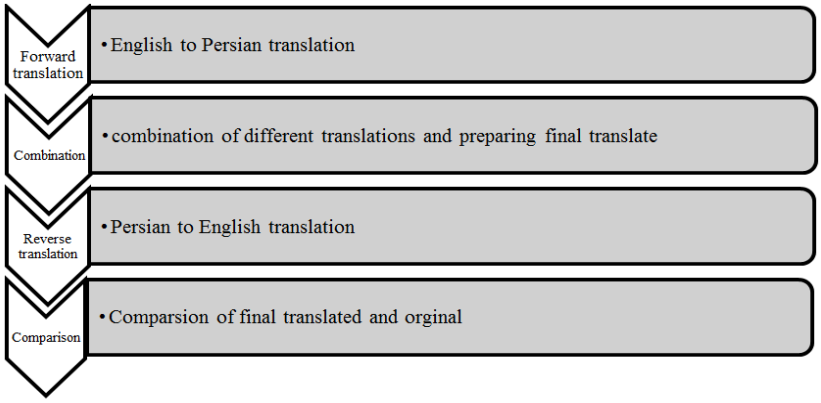

Figure 1. Translation process of the research instrument

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Discussion

The results of the present study showed that the reliability and validity of the GRAS questionnaire for evaluation of the reflection ability score of students was in an acceptable range. In addition, the results indicate that the reflection ability score among healthcare management students was in the medium range. The average level of this score in comparison with the high level of other studies (25, 26, 34, 35) may indicate that there is an opportunity for improvement and retention of students' reflection ability in the educational system. Healthcare management is a theory-based field which needs to train learners with high decision-making power. However, the university curriculum mainly focused on classical methods for the transfer of information. The educational curriculum in healthcare management refers to general concepts of reflection ability, while the main point for improvement of this ability is repetition and practice, and just exposure to the concepts will not help to reinforce this skill. The field of health care management has headlines that are often taught by lectures, and the opportunity to practice reflection and repetition skills during the course of study is very limited, leading to a lack of students' ability to reflect.

In line with our study, Stanley et al. in India on social service students and Aukes et al (36). In Netherland on medical students (37) reported a medium range of reflection ability. On the other hand, Edwards et al. (34), Grossman et al. (35) and Dock et al. (26) reported a high level of reflection ability. In our study, the score of reflection ability in the self-reflection category was better than empathetic reflection and reflective communication categories. In the study conducted by Stanley et al. (36) the status of the self-reflection category was better than empathetic reflection and reflective communication categories. The self-reflection category in this questionnaire is defined as opportunities for learning and cognitive and emotional analysis of social, cultural, and personal experiences in the learning environment (38). According to a search on various websites, no research was conducted in Iran to investigate and interpret the score of reflection ability with the GRAS questionnaire.

According to the results of the present study, the difference between total score and categories score of reflection ability in male and female students was not statistically significant. Although this score is lower in the female group than men, which may be due to the greater number of females in the study, this limitation cannot be generalized to other groups, given the limited diversity and sample size of this study. Our results were in line with the studies conducted by Grossman et al. (35) and Dock et al. (26).

In the present study, by using the Pearson correlation coefficient the correlation between age, educational semester and average was not significant (P-value $\geq$ 0.05). These results may be due to the small number of samples. The relationship between the score of reflection ability and the grade point average was negative, meaning that only the high average of the students' total score is not a reason for the student's' higher reflection ability and the education system only puts students on the path to good grades in theory and less attention is paid to the practical side of education.

It is recommended that this method be used among other medical students with a larger sample size, as this tool is designed specifically for the medical students. Limitations of this study include the self-report nature of the questionnaire in which individuals themselves should be judged on their ability to reflect, but studies have shown that self-report is not necessarily less accurate than that of peers. Also, the low number of samples is considered as the most important limitation due to the lack of cooperation of the students in filling or incomplete electronic form.

Conclusion

According to the results of this study, the GRAS questionnaire is a useful tool for assessing the reflection ability and can be used to design interventions and educational programs which aim

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to enhancement of the reflection ability of medical students. Also, the students' medium scores of reflection ability, indicates the need for serious attention of educational managers in planning this field.

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Conflict of interests

There is no conflict of interests about this research to be declared.

Authors' contributions

Keshmiri F, Shafiei M, Askari R and Jambarsang S, designed research; Rostami A conducted research; Jambarsang S and Rostami A analyzed data; and Keshmiri F, Shafiei M, Askari R, Jambarsang S and Rostami A wrote manuscript. Shafiei M had primary responsibility for final content. All authors read and approved the final manuscript.

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