Designing and Implementing Virtual Education Course of Media Literacy for Medical Sciences Students: An Experimental Study

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ABSTRACT

Background and Objective: One of the necessities of the information age is the need for education, especially in the field of media literacy. This study aimed to determine the effect of educational programs on media literacy of medical students of Shahid Sadoughi in Yazd in 2020.

Materials and Methods: An experimental study was conducted through a stratified random sampling design on 88 students (44 in the experimental group and 44 in control) of Shahid Sadoughi University of Medical Sciences, Yazd. The educational program was implemented using storyline software, and educational messages were sent to the students of the experimental group during 10 sessions. The data collection tool was a media literacy questionnaire that was completed before intervention and two months after the training program. The paired t-test and independent t-test were used to express analytical indices. All analyzes were performed in SPSS software version 26 and level of 5% was considered as significant level.

Results: The results of the chi-square test between demographic characteristics in the control and experimental groups showed that the two groups were identical in terms of study variables ($p > 0.05$). Before intervention, the mean scores of all variables in the control and experimental groups did not differ significantly ($p > 0.0\,5$), while the mean scores of "critical thinking", "production ability", "analysis ability" and "familiarity with media abbreviations" were significantly changed in the two groups ($p = 0.001$) after intervention.

Conclusion: According to the obtained results, education raises the level of media literacy in using the virtual world. It is suggested that the reasons for the lack of growth in media literacy in Iran need the further investigation. Considering media knowledge as the main course in educational programs of students is essential to promote their media literacy.

Paper Type: Research Article
Keywords: Media Literacy, Medical Students, educational program

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Introduction

In the recent world, the development of communication and information technologies has expanded communication and faced the audience with a high volume of diverse information. In the present age, the media's role to convey thoughts is undeniable (1). While, in today's world, considerable and effective media is located in the hands of the great powers. The role of media in raising awareness and promoting culture and general knowledge is undeniable (2).

McLuhan said" when the global village comes, human should be achieved new education which called media literacy". In fact, media literacy is creator a kind of skill to use of media and improve lives (3). The role of media in raising awareness and promoting culture and general knowledge is undeniable. In such a society, people are no longer passive and media-controlled audiences, but they actively deal with messages and become selective audiences. Therefore, media literacy could be considered as one of the most important phenomena in the information age that helps the audience to raise up their information and knowledge and break the habit to use media for entertainment and leisure and use it with insight and knowledge to produce and interpret messages (4).

The media is one of the most important socialization factors that affect the health behaviors of young people (5). Some studies estimate that young people spend 30-50% of their waking hours with the media. Understanding the information accuracy and the differences between them and advertising recommendations requires sufficient knowledge and media literacy. Therefore, media literacy is essential to make the positive effects and reduce the negative effects and it helps the audience to intelligently evaluate information and make decisions in the face of information (6).

The findings of a recent study on the use of media showed that about 30% of people when waking up daily spend exclusively with the media, and 39% of people use use media along other activities (4). It is worth mentioning that the use of cell phones has had positive aspects, especially for students, such as ease of transportation and easy access to use this device for learning. The results also show that students use their mobile phones more than 10 hours a week. Therefore, as cell phone use expands, so does the concern about the overuse and harmful use of this technology (7).

In such an environment, the audience must have at least the ability to independently and directly understand the media output. Accordingly, the set of factors that created this perceptual independence is called media literacy. Therefore, it can be said that a person who is incapable of confronting news or a film with independent perception is lacking media literacy (8). Media literacy is not just about the audience; it is about the media agents as well. Media literacy thus creates a cycle that brings literate brokers to face to face with literate audiences (9). Therefore, in the new era, the policy of increasing cultural and media awareness should be considered as a key element in media policies (10).

Media literacy has become a center of gravity for dealing with fake news, and a diverse range of stakeholders, from educators to legislators, individuals, and technologists, have diverted significant resources to media literacy programs (11). Media literacy is a process or set of skills based on critical thinking. Several organizations such as the Association of Research Colleges and Libraries and Partnership for 21st Century Skills have confirmed that media literacy skills could be included in the vision and framework of student success in contemporary society (12).

Access competence is necessary because a

person's ability to participate in media culture is predicted by his or her ability to find and choose the right medium. Thus, the development of media access competencies is an essential component of overall media literacy.

Among Middle Eastern countries, the number of Iranian social media and Internet users has significantly increased from 3.8% in 2000 to more than 68.5% in 2016 (13). Another study found that use of social media has increased over time, from 50% in 2011 to 77% in 2017 among American adults and from 16.8% to 84 % in the same period among Korean adults (13). Also, numerous studies have been conducted on the negative effects of mass media (14, 15) on people's health, including violence, high-risk sexual behaviors, obesity, physical dissatisfaction and eating disorders, smoking, and alcohol use. The positive impact of mass media on health also includes the provision of health information, lifestyle model/health-promoting norms, and the implementation of campaigns to reduce high-risk behaviors (16). From the perspective of social medicine, increasing social harm increases the burden of mental and physical illnesses, and it also increases the costs of disciplinary, judicial, and health services by reducing the quality of life and vitality of society.

A study entitled "Study of students' media literacy" showed that in the opinion of the studied students, conversational social media (WhatsApp, Telegram, Soroush, etc.) is the most used. and other medias such as subscription-based social media (Instagram, YouTube, Apparatus, and Twitter); Television; Books and magazines; Radio, podcasts, music, movies, and movies are next in importance (17). Also, a study entitled the role of Instagram social network in creating a sense of social inequality was conducted on students who studied in universities in Tehran. they examined the relationship between the feeling of social inequality caused by the messages reflected in the social network Instagram and individual's personal and social characteristics (e.g., age, gender, occupation, and social class) and situations (e.g., duration of membership in the social network Instagram, the amount of surfing and ...). Their finding showed that social network plays a significant role in creating a sense of social inequality among people (18).

A study showed that there is a relationship between media literacy, quality of life characteristics, and social health of employees who worked in the Farhangian University of Khorasan Razavi. Among the variables, quality of life is the strongest predictor of social health. The relationship between media literacy and the variable of positive, average, and significant academic performance (0.000) and the relationship between cyberspace addiction and media literacy (0.000) were also inverse and significant. But no significant relationship was found between contextual variables and Internet addiction (19). A study entitled Predicting academic burnout based on computer literacy and media literacy in female graduate students of Yazd University showed that the variables of computer literacy and media literacy have a significant inverse effect on academic burnout. Therefore, learning computer literacy and media literacy skills comprehensively can be effective in improving academic performance and consequently reducing students' academic burnout (20). In another study, there was a significant difference between gender and media literacy, and the rate of media literacy among female students was higher than male students. There was no significant difference between the field of study, marital status, and place of residence. Based on regression analysis, the multiple correlation coefficient between the variables was estimated to be 0.523, and the value of the explanation coefficient was

equal to 0.389, and the corrected coefficient of explanation was 0.355. This means that 35.5% of the total changes in the media literacy variable are explained by the remaining 5 variables in the regression model, which includes the variables of gender, age, marital status, critical thinking, and problem-solving skills (21).

On the other hand, the youth of the country's population, which is one of the most prominent demographic characteristics of Iran, requires special attention and they are at-risk because young people are exposed by many psychological and social harm (22). Today, young people are faced with a large amount of media content (23). There is also a high level of media production and society is saturated by the media, which has led to a profound impact of the media on perceptions, beliefs, and attitudes. The importance of communication and visual information is increasing, so the effective use of information is very important (24, 25).

Since media literacy is an educational topic and introduces a new type of literacy, the university can play an influential role in improving this type of literacy (26). Media literacy skills are underdeveloped at the university level, and media literacy training programs are limited in universities (27). Media literacy is especially important for students who are an informed and educated section of society. Due to the need for investigating such studies and the fact that this study has not been conducted in students of Yazd University of Medical Sciences, the present study aims to determine the effect of educational program on media literacy of Yazd University of Medical Sciences students as one of the important target groups in community.

Material and method

In this experimental study, stratified random sampling was used. According to the list of all students of Shahid Sadoughi Medical Schools in Yazd, the samples were randomly selected. The data collection tool was a questionnaire.

Sampling and study population

The sample size was obtained by calculating the common variance and placing it in Eq. (1).

Eq. (1)

$$S^2 = \frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}$$

$$n \geq \frac{\left(\left(z_{1-\frac{\alpha}{2}} + z_{1-\beta}\right)^2\right.}{d^2} s^2$$

According to Niazi et al.'s study, the knowledge score after the training program in the experimental and control groups was 11.05± 4.47 and 6.20± 3.22, respectively (28). Considering the significance level of 5 %, test power was 80%, and 2 points difference in the mean control score, sample size was equal to 40 people. Then, considering the 10% probability of sample loss, the final sample size is calculated to be approximately 44 in each group (intervention and control).

Study inclusion and exclusion criteria

Inclusion criteria included being Iranian and speaking Persian, willingness to participate in the study, a student studying in any of the faculties affiliated to Shahid Sadoughi University of Medical Sciences in Yazd in 2020. Exclusion criteria included not attending at least two training sessions (not participating in media literacy training programs) and transferring from Yazd University to other Iranian universities.

Description of the tool and its approval

The data collection tool in this study was Zolfaghari Media Literacy Questionnaire (Standard Media Literacy Questionnaire) (29). Based on this Standard Media Literacy Questionnaire to measure media literacy, several items or questions were obtained for each determining factor, including four components of media literacy, the ability to access and use the media (37

items in the form of questions 1, 2, 3, and 4), ability to analyze and evaluate media messages (17 items in the form of questions 5 and 6), ability to produce and communicate with media messages (14 items in question 7), and ability to think critically about media content (12 items in question 8) which was coded and evaluated based on Likert scale.

Cronbach's alpha coefficient (r = 929) was calculated and the internal consistency was confirmed.

Sampling and Educational program design

In the present study, the sampling type was stratified random sampling proportional to the volume. The samples were students of Yazd University of Medical Sciences. According to Niazi et al. (30), the number of samples in each experimental and control group was 44. For sampling, each of the university faculties was considered as a class. Then, in proportion to the student number in each faculty, the sample was compared to the total university population. In other words, non-random sampling, non-probability sampling was performed in each faculty. Before the training program, the questionnaires were completed by the students of both groups after completing the consent form. The results of the analysis of pre-test questionnaires were used as a criterion for the educational needs assessment. Thus, according to the pre-test results, because the students were very unfamiliar with the terms and definitions of literacy, media literacy, the importance of familiarity with this subject, and more broadly familiar with the components in this field, training sessions based on this prepared and adjusted in the form of a storyline. Then, the WhatsApp communication channel was provided to the participants, and the necessary trainings were given to the participant. In this way, the students were randomly selected and placed in the intervention and control groups. For the students of the experimental group, an educational program was performed based on the results of the analysis of pre-test questionnaires. The training program used in this study was given in the table (1).

Table 1: training program used in this study

Session	Title	Subject of education	Scope of educational goals
First	Introductory introduction to the training course and pre-test	Introduction, course objectives, course structure, motivation and importance of the course	(Cognitive) At the end of the first session, students will be able to: 1- State the objectives of the media literacy training course. 2-Explain the importance of the media literacy promotion training course.
Second	Familiarity with literacy and the concept of literacy	Literacy, the concept of literacy, the definition of literacy from different perspectives, types of literacy	Cognitive (knowledge and understanding) At the end of the second session, students will be able to: 1. Define literacy. 2. Define the types of literacy.
Third	Ability to access and use media	Familiarity with media, media definition, media characteristics, types of media and media history and the concept of media literacy	Cognitive (knowledge and understanding) At the end of the second session, students will be able to: 1. Define the media. 2. Explain the types of media. 3. Describe media literacy.
Fourth	Ability to analyze and evaluate media messages	Familiarity with media content, real world and media reality, media representation, ability to use media, conscious use of media	Emotional At the end of the third session, students will be able to: 1- Apply message analysis skills and get out of the passive and consuming state and enter into a reciprocal and active equation.

Fifth	Continuation of the session Ability to analyze and evaluate media messages	Develop message analysis skills, whether news or entertainment, to enhance the independent capabilities of active individuals and users.	Emotional At the end of the third session, students will be able to: 1- Apply message analysis skills and get out of the passive and consuming state and enter into a reciprocal and active equation.
Sixth	Ability to generate and communicate with media messages	Encourage production, creativity and interaction in various areas of media communication	Cognitive At the end of the fourth session, students will be able to: recognize products and creativity in the media
Seventh	Media literacy and media influences	Familiarity with media content, media industries, real world and media reality, media representation and media use ability	Cognitive Students will be able to: Know the effects of the media at the end of the session.
Eighth	Ability to think critically about media content	Develop and develop critical thinking skills and critical evaluation of messages, whether news or entertainment, in order to strengthen the independent abilities of individuals and active users.	Emotional and psychomotor at the end of the fifth session, students will be able to: Learn critical thinking skills (critical thinking means logical thinking that focuses on what a person decides to do and what to do). Students can practice critical thinking skills.
Ninth	Continuation of the sixth session	The importance of critical thinking skills, the formation of critical thinking skills, barriers to critical thinking, strengthening critical thinking	Emotional and psychomotor at the end of the fifth session, students will be able to: Learn critical thinking skills (critical thinking means logical thinking that focuses on what a person decides to do and what to do). Students can practice critical thinking skills.
Tenth	Analyzing clips and summarizing and performing post-test after 2 months	Analyze the goals of the clip and its result	Cognitive, emotional, psychomotor

The educational program was designed according to the current conditions of the society and the educational system following the pavilion of Covid 19 and the need for e-learning, educational content based on the texts of books, articles, and reputable sites was prepared and adjusted by storyline software. The four components included access to and use of media, the ability to analyze and evaluate media messages, the ability to produce and communicate with media messages, and critical thinking about media and media messages. According to the volume of materials and their classification, the number of sessions was selected as ten sessions, and in ten sessions, one training session per week was conducted for 45 to 60 minutes. The duration of the training (implementation of the training program) lasted two months and two weeks. The mentioned cases were done through WhatsApp social messenger, and they were given a checklist and their reaction to the mentioned components of media literacy, to the clips that were socially accepted and approved by the professors of the research team, and they recorded their chosen option. To comply with ethical considerations, the same content was awarded to the control group at the same time as the training program.

Statistical analyzes

Initially, the normality of the data was analyzed using the Kolmogorov-Smirnov test. Given that the larger test statistic was 0.05, the data were normal. Hence, to perform inferential statistics, due to the normality of data distribution, Paired Samples T-Test

was used to compare the means of each group before and after the training program. Independent-Sample T-Test was also used to compare groups at the beginning and end of the study. Statistical analysis was performed using SPSS software version 26. The significance level of the analyzes was considered to be 5%. Also, frequency, percentage, mean and standard deviation were used to describe.

Results

Demographic characteristics based on the frequency distribution, number, and percentage of students participating in the study are given in Table 2. A total of 88 students entered the study based on the results obtained from demographic information. Of these (56 people), 36.36% were women. The highest and lowest levels of education of the participants in the study were 44.31% (39) for Ph.D. and 25% (22) for bachelor, respectively. 52.27% (46) of the people were in the age range of 23-26 years, (44) 50% were residents of the dormitory, and (66) 75% were non-natives.

The results of the demographic chi-square test between the control and intervention groups are given in Table 2. According to Table 2, the two groups were identical in terms of study Scio-demographic characteristics (p> 0.05).

Table 2. homogeneity of study groups in terms of demographic variables

Demographic		Control N (%)		Intervention N (%)		P
Age	19-22	12	27.3	10	22.7	0.35
	23-26	23	52.3	23	53.2	
	27-30	9	20.5	11	25	
Gender	Man	15	34.1	17	38.6	0.65
	Female	29	65.9	27	61.4	
Marital status	Single	36	81.8	35	39.5	0.78
	Married	8	18.2	9	20.5	
Father's education	illiterate	8	18.2	11	25	0.33
	elementary School	4	9.1	6	13.6	
	Middle school	6	13.6	2	4.5	
	Diploma	5	11.4	10	22.7	
	Associate Degree	7	15.9	6	13.6	
	Bachelor's and higher	14	31.8	9	20.5	
Mother's education	illiterate	6	13.6	16	36.4	0.005
	elementary School	2	4.5	2	4.5	
	Middle school	14	31.8	4	9.1	
	Diploma	7	15.9	11	25	
	Associate Degree	3	6.8	7	15.9	
	Bachelor's and higher	12	27.3	4	9.1	
Father's job	manual worker	1	2.3	0	0	*0.04
	Employee	15	34.1	23	52.2	
	the farmer	5	11.4	0	0	
	Free	22	50	17	38.6	
	Retired	1	2.3	4	9.1	

Mother's job	Housewife	30	68.2	20	45.5	0.07
	Employee	13	29.5	24	54.6	
Field of Study	Nursing – Midwifery	6	13.6	6	13.6	0.99
	Paramedical	6	13.6	6	13.6	
	Health	9	20.5	9	20.5	
	Medical	14	31.8	16	36.4	
	Dentistry	6	13.6	4	9.1	
	Pharmacology	3	13.6	3	6.8	
Grade	BSc	14	31.8	13	29.5	0.3
	MSc	8	18.2	14	31.8	
	Ph.D.	22	50	17	38.8	
residence	student dormitory	20	45.5	24	54.5	0.77
	Private house	8	18.2	8	18.2	
	Parents' house	8	18.2	5	11.4	
	Other	8	18.2	7	15.9	
Being a native	Native	12	27.3	10	22.7	0.62
	Non-native	32	72.7	34	77.3	

* Fisher's exact test

The average scores of each item in the students in the control and intervention groups before the implementation are given in Table 3. Also, the results of statistical analysis showed that the mean scores of each item in the students in the control and experimental groups before the training program

Table 3: Comparison of each item mean scores in the students in the control and intervention groups before implementation

Items	Control		Intervention		P
	Mean	SD	Mean	SD	
Media usage rate	19	3.71	18.56	3.48	0.57
Use the media to obtain information	20.72	5.18	22.54	6.07	0.135
Familiarity with media concepts and terms	33.59	7.75	32.88	8.42	0.681
Media access rate	9.5	1.21	9.47	1.7	0.943
The ability to analyze and evaluate media (message origin)	14.09	4.05	13.88	4.39	0.821
Ability to analyze and evaluate media messages (familiarity with media abbreviations)	24.6	7.54	29.15	9.72	0.007
Ability to generate and communicate with media messages	29.2	10.75	36.2	14.12	0.021
Critical thinking about media and media messages	31.84	5.7	33.02	5.67	0.332
Familiarity with media effects	12.4	3.76	11.86	3.86	0.505
Motivate the person to use the media	15.81	3	16.77	4.58	0.252
Barriers to accessing information	19.81	3.77	19.47	4.08	0.685

did not differ significantly (p> 0.005). For example, critical thinking about media and media messages in control and intervention groups was 31.84±5.7 and 33.02±5.67, respectively. Individual's-motivate to use the media was 15.18±3 and 16.77±4.58 in control and intervention group, respectively.

Table 4: The average scores of each item in the students in the control and intervention after implementation

Items	Intervention		Control		P
	Mean	SD	Mean	SD	
Media usage rate	18.97	3.81	18.93	3.86	0.956
Use the media to obtain information	21.25	5.46	23.63	6.19	0.059
Familiarity with media concepts and terms	31	6.62	38.02	7.15	0.046
Media access rate	8.36	1.18	8.18	1.15	0.532
Ability to analyze and evaluate media messages (message source)	14.59	4.24	21.79	2.25	*<0.001
Ability to analyze and evaluate media messages (familiarity with media abbreviations)	24.34	7.55	41.56	5.38	*<0.001
Ability to generate and communicate with media messages	26.09	4.71	36.43	2.73	*<0.001
Critical thinking about media and media messages	31.27	5.21	4.43	3	*<0.001
Familiarity with media effects	12.06	3.9	11.75	3.44	0.686
Motivation to use the media	15.36	2.86	16.68	4.67	0.114
Barriers to accessing information	19.52	4.25	19.36	4.49	0.865

The average scores of each item in the students in the intervention and control groups after the training program are given in Table 4. Based on the results, the results of statistical analysis showed that the mean scores obtained in "critical thinking", "production ability", "analysis ability", and "familiarity with media abbreviations" in the control group were higher than (4.43±3, 36.43±2.73, 21.79±2.25, and 41.56±5.38, respectively) in the intervention group (31.27±5.21, 26.09±4.71, 14.59±4.24, and 24.34±7.55, respectively). The difference between the tested items in the two groups (control and intervention) was also statistically significant (p <0.001). In other cases, the difference tested was not statistically significant (p> 0.8).

Table 5: Average scores of each item in students in the intervention group before and after the training program

Items	Before		After		P
	Mean	SD	Mean	SD	
Media usage rate	18.56	3.48	19.93	3.86	*<0.001
Use the media to obtain information	22.54	6.07	23.63	6.19	*<0.001
Familiarity with media concepts and terms	28.88	8.24	32.02	7.05	*<0.001
Media access rate	9.47	1.7	9.18	1.15	*<0.001
Ability to analyze and evaluate media messages (message source)	10.88	4.39	13.7	2.25	0.165
Ability to analyze and evaluate media messages (familiarity with media abbreviations)	29.15	9.72	41.56	5.38	0.001
Ability to generate and communicate with media messages	36.2	14.12	36.43	2.73	0.063
Critical thinking about media and media messages	33.02	5.67	43.43	3	0.005
Familiarity with media effects	11.86	3.86	11.75	3.44	*<0.001
Motivation to use the media	16.77	4.58	16.68	4.67	*<0.001
Barriers to accessing information	19.47	4.08	19.36	4.49	*<0.001

The average scores of each item in the students in the intervention group before and after the training program are given in Table 5. The mean of the studied items in the intervention group after the implementation of the training program was higher than before the implementation of the training program. Also, the results of statistical analysis showed that the difference observed in most items was significant (p <0.001), such as Media usage rate (16.68±4.67), Motivation to use the media (19.36±4.49), and Barriers to accessing information (19.93±3.86). In other words, the implementation of the training program (training) has improved all three skills in the intervention group. However, the difference between "media message generation ability" (36.43±2.73) and "media message analysis and evaluation ability" (41.56±5.38) was not statistically significant (p> 0.005).

Table 6: Each item average scores in the studied students in the control group before and after the implementation

Items	Before		After		P
	Mean	SD	Mean	SD	
Media usage rate	19	3.71	18.97	3.81	*<0.001
Use the media to obtain information	20.72	5.18	21.25	5.46	*<0.001
Familiarity with media concepts and terms	33.59	7.75	31	6.62	*<0.001
Media access rate	9.5	1.21	8.36	1.18	*<0.001
Ability to analyze and evaluate media messages (message source)	14.09	4.05	14.59	4.24	*<0.001
Ability to analyze and evaluate media messages (familiarity with media abbreviations)	24.06	7.54	24.34	7.55	*<0.001
Ability to generate and communicate with media messages	29.9	10.75	26.09	4.71	0.23
Critical thinking about media and media messages	31.84	5.7	31.27	5.21	*<0.001
Familiarity with media effects	12.4	3.76	12.06	3.9	*<0.001
Motivation to use the media	15.81	3	15.36	2.86	*<0.001
Barriers to accessing information	19.81	3.77	19.52	4.25	*<0.001

The average scores of each item in the studied students in the control group before and after the implementation of the educational program are given in Table 7. The mean of the studied items in the control group before and after was almost equal. In most items, the average "after" scores were lower than "before". Based on the results of statistical analysis, the difference observed in most items was significant (p <0.001). For example, "Motivation to use the media" was 15.81±3 and 15.36±2.86 or "Critical thinking about media and media messages" 31.84±5.7 and 31.27±5.21, before and after intervention, respectively. There was no significant difference in "ability to produce and communicate with media messages" alone.

Discussion

Today, there is a formal curriculum for teaching media literacy to students in some countries, such as the United States, the United Kingdom, Germany, Malaysia, Japan, Sweden, Russia, Singapore. In Iran, this issue has been considered at the level of general education, and its official curriculum has been prepared. However, at the level of higher education, this issue has not yet

been considered as part of the general curriculum of all disciplines (31). Therefore, this study aimed to determine the effect of educational programs on media literacy of 88 medical students of Shahid Sadoughi in Yazd. In the present study, the content of the educational program included stating the importance of the subject, introductory explanations of the concepts of media literacy and its types. Then, in a broader sense, four components of media literacy explanation were provided, which included the ability to access and use media, the ability to analyze and evaluate media messages, the ability to produce and relate to media messages, and the ability to think critically about media content. Finally, the clips and photos were provided to the control group after intervention program.

After watching the submitted items, students were asked to answer the questionnaire. Based on the results obtained from demographic information, a total of 88 students entered the study. Taghizadeh et al. also compared the media literacy of male and female students in Kerman and found that the level of media literacy in terms of demographic information was higher in male students than female students in high schools in Kerman. There is also a significant relationship between media literacy and variables of gender and field of study (32). The statistical analysis results showed that the mean scores of each of the studied areas in students in the intervention and control groups before the training program did not differ significantly ($p > 0.005$). Comparison of the mean score of the ability to access and use the media in medical students of Shahid Sadoughi Yazd before the training program and during two months follow up in 1399 showed that the ability to access and use the media in both groups were same before and after intervention and statistical significant difference was not observed between both groups.

In the educational program designed in this study, the researcher introduced media concepts and terms in detail to the students. Therefore, two months after the implementation of the program, 14% an increase in knowledge score was observed in the intervention group; In other words, education has increased the familiarity of people with media terms. In this study, the ability to analyze and evaluate media messages in participants in both groups at the beginning of the study was from 34.8% - 48.6% (15-21). However, in the control group, the highest rate of message analysis and evaluation (52.27%) was related to attention to "creator and creator of the message" (23). In the intervention group, attention to "audience attraction techniques" was (20) 46.6%. Therefore, teaching students has caused a change in attitude and ability to analyze and evaluate media messages in the intervention group. Schmidt et al. (2013) emphasized in a study that media literacy education in universities should be done to improve the ability to analyze the media message and understand its goals to students. The results of their study showed that the implementation of media literacy training programs implemented throughout the educational system is effective in increasing and improving the ability to create and analyze media messages (27).

Comparison of the mean score of ability to produce and communicate with media messages in Shahid Sadoughi medical students in Yazd before the training program and two months after intervention was also investigated in the present study. Regarding the ability to produce media messages, several obstacles were identified in the optimal use of media. For example, the amount of attention to the history of sites after the implementation of the training program has increased to 3.44 (15) in the control group. The level of mastery and ability to produce and

communicate with media messages in the control group was in the range of "low familiarity". After training, the level of familiarity of people with the use of various media in the intervention group has increased by an average of (8-11) 20 to 25%. Comparing the media literacy status of Birjand and Poonay industrial students in India in 2016, Kardan Moghadam et al. found that Birjand industrial students are in a better condition compered with Poonay India student's in terms of producing media messages, understanding the meaning of sent messages and media use because in India, not much attention has been paid to media literacy education (33). These educational needs are divided into functional and critical dimensions in Chen et al. model. The functional dimension refers to access, how to use, and produce media messages (34). Mader et al. also cited media message generation skills as part of media literacy competencies.

In a study, they emphasized that students need to several skills to turn their ideas into media messages and make better use of the media (35). The mean score of critical thinking ability comparison towards media content in Shahid Sadoughi medical students of Yazd before the training program and two months after intervention showed the frequency distribution of respondents according to critical thinking level towards the media and messages. Media in the intervention group has increased after the implementation of the training program. So, level of critical thinking in the experimental group was in the range of "average familiarity" with an average score of (20-25) 59-45% and after the implementation reached to (23-30) 68-54%. Hosseini Pakdehi and his colleagues compared "media literacy" training in a comparative way on the SmartMedia Canada website and the Iranian media literacy website, and showed that launching and creating media literacy training websites can promote the proper use of media, and the critical thinking to be effective to improve media literacy.

In this regard, the comparison of Iranian and Canadian websites showed that the Canadian website pays more attention to media literacy training content than the Iranian media literacy website and it use the experts opinion to designs and presents educational content that citizens need (36). Eskandari et al., in a 2016 study stated that despite the high rate of access to the Internet by young people (96%), their critical thinking status is moderate (37). Zhang et al. 2020, by studying the level of media literacy of the students of the Radio and Television College, found that level of students' critical view toward the media is low and students need coherent programs for teaching critical thinking (38).

Solhi et al. studied the critical situation of students towards the media in students and found that students do not have the necessary power to criticize the media (39). Therefore, it can be said that education can improve the level of media literacy and philosophical thinking of people in using the media. Ashrafierizi et al. in 2016 examined the level of media and information literacy of students who studied in Isfahan University of Medical Sciences found that the level of media and information literacy of students of this university is higher than average and relatively desirable (33). In the present study, the level of media literacy in the control group increased after implementation and was higher than the level of media literacy in the intervention group. The observed difference was statistically significant. As the implementation has improved the level of media literacy of the students in the intervention group. In 2012, Saleh et al. studied the state of media literacy and information of students at the University of Cape Town and found that the students of this university are not

at the desired level in terms of media literacy (40). In a study by Azizi et al. In 2021, the results showed that in any case, media literacy seems to be a necessary skill that can moderate the effects of mass media and allow the audience to be full awareness toward media messages process (10). Also, in terms of media criticism, they need the skills of analysis and evaluation of conventional methods of presenting messages in the media and understanding the ideological aspects, cultural and social dimensions, which is consistent with the results of the present study (35).

Finally, it can be said that the implementation of educational programs is a way to increase media literacy, which makes the audience react appropriately to the density of information and select the information that they need. However, it seems that addressing media literacy and educating it through the educated class to other members of society is a necessity.

Limitations and suggestions

Research Limitation is an integral part of any research. Therefore, this research is not free of limitations, and the researcher has tried to reduce these limitations, as not to reduce the validity of the investigation. This study was statistically limited to Yazd Shahid Sadoughi University of Medical Sciences. Therefore, generalization of results to students of other medical and non-medical universities should be done with caution. Therefore, it is suggested that the study of the factors affecting media literacy in medical and non-medical students and the effect of training courses on their entry into the promotion of media literacy be examined by other studies.

Conclusion: In the Iranian higher education system, despite some signs to understand its necessity, no important action has been taken to design, develop and implement a media literacy curriculum, whether in the form of formal or extracurricular curriculum. In the present study, four components of media literacy were examined, which included the ability to access and use media, the ability to analyze and evaluate media messages, the ability to produce and communicate with media messages, and the ability to think critically about media content. According to the results, the level of media literacy of students in the intervention group increased significantly after the implementation of the educational program. After the implementation of the educational program, the ability to analyze incoming messages increased and students were able to analyze higher than media messages. Students' familiarity with media terms and the ability to produce media messages were also enhanced; But in the control group, there was not much improvement in the ability to analyze and produce media messages. Also, the level of critical thinking of the students in the intervention group increased significantly compared to the control group, as well as before the implementation of the educational program, which according to the results, holding media literacy training courses can improve students' media literacy.

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