JCHR

Journal of Community Health Research 2018; 7(1): 48-56.

The Relationship between Multiple Intelligences and Health Literacy in Health Students in Gonabad UMS, 2017

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ARTICLE INFO

Original Article

Received: 11 Oct 2017
Accepted: 19 Feb 2018



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ABSTRACT

Introduction: In regard to the importance of health literacy for creating a healthy society, the role of Howard Gardner's multiple intelligences is among the factors influencing health literacy. The purpose of this study is to investigate the role of multiple intelligences on health literacy of students.

Methods: This is a descriptive correlational study. The statistical population includes students studying at the School of Public Health at Gonabad University of Medical Sciences in 2017. The sample size chosen was 170 based on random stratified sampling. In order to collect the data, Montazeri et al.'s Health Literacy Questionnaire, and Gardner's Multiple Intelligence Questionnaire were used. Data was analyzed through SPSS 20. The Pearson correlation coefficient, regression and independent t-test were used to analyze the data.

Results: The mean and standard deviation of students' scores in the health literacy variable were 62.01 ± 9.17. The results showed that all aspects of multiple intelligences have a meaningful relationship with health literacy. Also, multiple intelligence components were 43.3 percent able to predict student health literacy.

Conclusion: Considering the positive and significant relationship between multiple intelligences and health literacy, it is suggested that training courses and workshops be used to promote and strengthen the multiple intelligences and health literacy of students at the School of Public Health.

Keywords: Health Literacy, Gardner's Multiple Intelligences, Gardner, Students

How to cite this paper:
Ajam AA, Hemmatipoor O. The Relationship between Multiple Intelligences and Health Literacy in Health Students in Gonabad UMS, 2017. J Community Health Research. 2018; 7(1): 48-56.

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Introduction

Health literacy can be considered the most important factor affecting health. So today, researchers believe that improving health literacy can help reduce illness in the early stages of life and encourage practices that promote wellness [1]. Research in Iran shows that various factors affect people's attention to health literacy [2]. Most patients do not have adequate health literacy [3, 4]. Individuals with a higher level of literacy assess their general health status better, and they are also more motivated towards doing preventive behaviors [5]. Health literacy in such a situation crucial, as it increases the awareness and skills of individuals in maintaining their health.

Health literacy can be defined as "Observing the principles of health and the environment with the promotion of health" [6]. In other words, it is "Capacity, processing and understanding of basic health information and services needed to make good health decisions" [7]. However, it should be borne in mind that in fact health literacy is a principle of learning (knowledge, attitude, and ability) that guides people to the right decision for health, including the prevention of various illnesses, proper nutrition, health care, early screening, etc [8].

The term 'health literacy' was first used in scientific literature related to health education. Today, it is promoted academically by the medical sciences [9]. Medical students have higher health literacy than non-medical students. However, according to research conducted, even among medical students there is also an inadequate level of health literacy [10]. The healthcare system generates health information and information for the community, and provides useful and effective training on the capabilities and skills needed in the area of health today through websites and even the health network [11]. Education and training methods for medical students who promote the health of the general populace and who transfer health literacy to the public in the media and in medicine professionally should be taken into consideration, noting that the education and assessment of health literacy are always in the form of different skills, including understanding, access, assessment, decision making, and reading skills [5, 9]. Therefore, in order to increase the quality of their educational programs, in the design and delivery of educational materials in this regard, students' individual skills and differences must be taken into account.

In this regard, a clever-based curriculum that has a significant impact on the student's progress and learning is considered in this article [12, 13]. The Gardner's theory of multiple intelligences is used because of its educational functions and its impact on the deep and strategic learning approaches and also due to its attempt to take on the potential of students. It is very useful for educational approaches and has a very strong impact on the development of learner talents and the efficiency of the educational environment [14]. Even programs based on this theory can be used as useful interventions to enhance students' intelligence skills [15].

Gardner's theory of multiple intelligences is referred to as "the different learning key", which, through comprehensive discussions between teachers and students, has led to increased understanding, curiosity, competence and even self-esteem in students. Some consider it as the most practical curriculum theory [16]. With this theory, it is possible to educate people through different ways of seeing and hearing and beyond pen-and-paper literacy [17]. It also fosters various aspects of intelligence and improves the performance of individuals in different fields, as researchers have succeeded in fostering individuals' performance in spatial and Bodily-kinesthetic intelligence [18, 19]. It is also used for training, research skills and critical thinking [20]. Various studies have been conducted separately on the relationship between the multiple intelligences and health literacy, including research results which showed that intelligence differences are a cause for inequality in individuals' health [21].

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Intelligence is an important predictor of performance, work and various areas of social and economic life, and provides strategies for reducing low intelligence risks [22]. Verbal and mathematical intelligence have the largest share in predicting academic achievement [23]. In addition, in the experimental science group, students' success is more correlated with Bodily-kinesthetic and verbal–language intelligence [24]. In general, the practical uses of Gardner's intelligences theory reflect the innovative uses of teachers, educators and planners that provide executive performance in terms of efforts to diversify educational programs and activities, and can provide a boost to Gardner's multiple intelligences [25]. Opportunities and learning experiences are essential tools for achieving goals [26].

According to a study by the researcher on the background of the research on health literacy and multiple intelligences, including Ounbi et al. [27], Costins et al [28], Making et al. [29], and Neibam et al. [30], it was found that a combination of factors affects health literacy and health status. One of the factors influencing health literacy is improving one's skills. By increasing skill level, health literacy can be improved. Even implementing and evaluating health literacy one curriculum in schools and modifying curriculum with effective teaching methods and techniques was done, as the training and development of educators is best suited to the health literacy needs of individuals. In addition, Amini et al. [26], Rahimi et al. [31], and Badiei et al. [19], presented practical implications for the Gardner's theory of multiple intelligences in the design phase of opportunities and learning experiences. With this theory, it is possible to develop the students' creative thinking and, through the application of the educational styles of the multiple intelligences, can lead to the student's academic achievement.

In summary, from the background of the current research process, especially the new research, it is important to note that today, to promote health literacy, people's skills and training, especially in terms of effective teaching methods and techniques as well as informed educators is quite evident. In the area of curriculum, various research has also claimed the success of this important thing with the use of Gardner's theory of multiple intelligences in educational system. Meanwhile, this theory tries to result in flourishing of various types of intelligence among students through focusing on various educational activities and opportunities.

Therefore, the present study aims to clarify the relationship between health literacy and Gardner's theory of multiple intelligences with the aim of providing and facilitating educational strategies for quantitative and qualitative improvement of health literacy status. As such, the appropriate educational context is provided by theory to promote the comprehensive health literacy level of medical students. By reviewing the research background, a research that examines the relationship between these two variables simultaneously has not been done. In this regard, the research is unprecedented. Regarding the above, the researcher attempts to answer this research question: Is there a significant relationship between the multiple intelligence components with the health literacy of students at the School of Public Health?

Methods

The present study is a descriptive-correlational study. The statistical population includes all the students of the faculty of health of Gonabad University of Medical Sciences, totaling 294 people. A stratified random sampling method, the Krejcie and Morgan's table, was used in selecting the sample, resulting in a sample size of 170.

Two questionnaires were used in this study.

A: The first tool was health literacy questionnaire; this scale has been standardized by Montazeri et al [32], and consists of 33 items (the minimum total tool score is 33 and the maximum total score is 165). This tool has five levels: access (6 items), reading skills (4 items), comprehension (7 items), assessment (4 items),

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decision and application of health information (12 items). On this scale, subjects respond to a scale of 33 questions on a 5-level Likert scale (very high 5 and very low 1). Findings of Montazeri et al. have shown that the reliability of the following components is reading skill is 0/72, access 0/79, understanding 0/86, evaluation 0/77, decision 0/89. The reliability of the whole tool has been reported from 0/72 to 0/89 by Cronbach's alpha method. Validity of this scale has been reported through structural validity, qualitative content validity, and the formal validity of desirable quality method.

B: The second tool was Gardner's multiple intelligences questionnaire. This questionnaire is a self-report tool. This scale has been standardized by Azarfar [33], and consists of 80 items. Subjects respond to these 80 questions, choosing from 5 multiple choice options for each based on the Likert spectrum from very low [1] to very high [5]. The instrument has eight levels of verbal-linguistic intelligence (10 items), logical-Math intelligence (10 items), spatial intelligence (10 items), Bodily-kinesthetic intelligence (10 items), musical intelligence (10 items), interpersonal intelligence (10 items), intrapersonal intelligence (10 items), and naturalistic intelligence (10 items). The reliability of each of the above levels has been reported to be 0/81, 0/77, 0/81, 0/73, 0/85, 0/87, 0/88, and 0/89 respectively. The verbal and content validity of this scale has been confirmed by experts.

For distribution of questionnaires, in coordination with the faculty, it was allowed by the professors of each discipline, and in the last 35 minutes of the class, the questionnaires were completed and then collected. In order to observe ethical considerations, the researcher, by introducing themselves and explaining the objectives of the research, assured the sample group that their information would remain confidential. To analyze the data with SPSS 20, Pearson correlation coefficient, regression and independent t-test were used.

Results

Of the 170 students participating in the study, 127 were women and 43 were men. The mean and standard deviation of students' score in the multiple intelligences variable was 300/48 ± 31/75 and the health literacy variable was 62/01 ± 9/71. Multivariate analysis of variance (MANOVA) was used to examine the differences between different dimensions of student intelligence with respect to gender. The results of the box test for homogeneity of the variances were not significant (sig = 0/21, f = 1/18), so the variance of the groups was equal.

Table 1. MANOVA's test results to examine the different dimensions of multiple intelligence among male and female students

Effect	Value	F	P-value	Partial eta squared
Gender Pillai's trace	0.077	1/68	0/10	0/077
Wilkes Lambda Test	0.923	1/68	0/10	0/077

The results of Table 1 showed that there was no significant difference between the various dimensions of multiple intelligences in male and female students. The Pearson correlation coefficient was used to investigate the relationship between the multiple intelligences and health literacy in students of the Faculty of Health of the University of Medical Sciences.

The results of Table 2 show that there is a positive and significant relationship between all aspects of multiple intelligence with health literacy in the students of the Faculty of Health of Gonabad University of Medical Sciences.

Several regressions were used to predict the students' health literacy through multiple intelligence components.

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Table 2. The results of correlation coefficient between multiple intelligence components with health literacy in students of School of Public Health

Variables	Verbal-linguistic intelligence	Logical-Math intelligence	spatial intelligence	Bodily-kinesthetic intelligence	Interpersonal intelligence	Intrapersonal intelligence	Musical intelligence	Naturalistic intelligence
Health literacy	0/471**	0/495**	0/232*	0/229*	0/451**	0/487**	0/251*	0/356**
P-value	0/000	0/000	0/002	0/002	0/000	0/000	0/001	0/0017

** - Significance at the level of 0.01
* - Significance at the level of 0.05

Table 3. Multiple regression analysis results to predict students' health literacy through multiple intelligence components

Predictor variables	Unstandardized B	Std. error	t	P-value
Verbal-linguistic intelligence	0/30	0/20	2/12	0/027
Logical-Math intelligence	0/448	0/13	3/32	0/001
spatial intelligence	0/029	0/20	0/094	0/92
Bodily-kinesthetic intelligence	0/102	0/23	0/44	0/65
Interpersonal intelligence	0/311	0/18	2/21	0/019
Intrapersonal intelligence	0/489	0/19	2/52	0/01
Musical intelligence	0/18	0/13	1/35	0/17
Naturalistic intelligence	0/358	0/17	2/36	0/011

$F_{(5,279)}$ =35/15 , P value<.0/001, R^2= 0/433

In this model, the health literacy variable was modeled as the criterion variable and the variable components of multiple intelligences as the predictor variable. As seen in Table 3, the observed F value was significant, and 43.3 percent of the students' health literacy variance was determined by the components of verbal-linguistic intelligence, logical-math intelligence, interpersonal intelligence, intrapersonal intelligence, naturalistic intelligence from the multiple intelligence variable.

Discussion

The purpose of this study was to investigate the role of multiple intelligences on the health literacy of students at the Faculty of Health of the University of Medical Sciences. The results of this study showed that the health literacy rate of the students of the Faculty of Health was higher than the average. The results also showed that there is a positive and significant relationship between the components of multiple intelligences with the students' health literacy.

These findings are consistent with the findings of the research by Vero [34], Karuchi [35], Wang et al. [36]. In their research, they showed that low intelligence is a risk factor for less health and health inequalities. Health literacy controls variables such as conscience, economic and social status. Also, the emotional intelligence of surgeons has a positive effect on patient communication and satisfaction. In the explanation it can be stated that although intelligence is studied in several respects in order to investigate it in detail, it should be noted that intelligence is a general ability that predicts all human behavior. Improving the level of health literacy also requires the involvement of people in different skills, such as paying attention to Bodily-kinesthetic skills to promote physical health and prevent overweightness and obesity that is so prevalent in the community. Verbal-

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linguistic intelligence should also be considered in order to establish the healthy relationships and social interactions. This finding is inconsistent with the research of Medik, which concluded that there is no significant relationship between intelligence, health indicators and meaningful behaviors.

Although it can be argued that intelligence is an important factor in predicting individual behaviors, it should be noted that various factors affect health literacy. Mental problems such as stress and depression, bad habits, and family environment that justify the promotion of specific behavior without reason should not be ignored.

The results of this study showed that the components of verbal-linguistic intelligence, logical-math intelligence, interpersonal intelligence, intrapersonal intelligence and naturalistic intelligence of the multiple intelligences framework can predict the health literacy in the students of faculty of health of Gonabad Medical School. The findings are consistent with Mas [37], Becker [38], and Perkins [39], who concluded in their research that introverted individuals struggle with social issues by internalizing symptoms of their mental health problems.

Teaching verbal and non-verbal skills is also associated with mental health, especially the prevention of violence. Therefore, it can be stated that each of multiple intelligences has a different function in individuals. People who have a problem or disorder in a specific intelligence will have related the health issues.

Students at the Faculty of Medicine have also had better performance in their academic disciplines, which should be addressed by the mentors. For example, by reinforcing the verbal-linguistic intelligence of medical students, not only can they improve their relationship with and satisfaction of their patients, but by improving the social relationships of both patients and physicians, mental health can be improved on both sides.

The results of this study showed that the level of each of the multiple intelligences is not different between male and female students. The findings of this study are consistent with the findings of Rezakhani [40] and Pashashriffi [41]. Rezakhani in constructing and standardizing the Gardner's multiple intelligences test; found that the results are not different from that of male and female, except in Bodily-kinesthetic intelligence. Similarly, there was no significant difference in Pashashriffi's research between types of intelligence, except for intrapersonal intelligence and spatial-vision intelligence between the two genders. In explaining this finding, it can be stated that education, facilities and conditions have failed to affect the multiple intelligences of both genders. It can be said that in terms of cultivating students in the field of multiple intelligences, Gardner's is a paradigm does not show either gender having significant advantages other the other. Progress is the same for both genders. The analysis of the content of pre-university textbooks shows that they have not succeeded in gender segregation [42].

Conclusion

The connections of the multiple intelligences with the students' health literacy are meaningful and predictable, which suggests that multiple intelligence programs should considered an appropriate tool in addition to health literacy. To cope with the consequences of health literacy, planning can even be started from the beginning of students' curriculum. By holding training courses and various workshops, education can be uniformly integrated for all students and lead to group training (different groups of the same). Highlighting skills provided the ground for advancement in all fields of science, including health literacy.

Considering the results of this study showed that there is a positive and significant relationship between the components of multiple intelligence with students' health literacy, it is recommended to use the multiple intelligences theory to design the health education curriculum of medical sciences university as well as in education and teaching the students. Considering that the

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components of verbal-linguistic intelligence, logical-math intelligence, interpersonal intelligence, intrapersonal intelligence and naturalistic intelligence from multiple intelligence variable can predict the health literacy in students at the faculty of health of Gonabad medical sciences university, it is recommended that a set of skills and abilities related to each component of intelligence be used to promote students' success in different areas.

One of the limitations of this study is the implementation of this research among undergraduate students of the Faculty of Health of Gonabad University of Medical Sciences. Therefore, caution should be exercised in generalizing its findings to other disciplines and educational levels.

Acknowledgments

The present research is a research project with the same title sponsored by Payam-e-Noor University. The researchers appreciate all the students of the faculty of health of Gonabad University of Medical Sciences, who collaborated on the research.

Conflict of Interest

The authors declare that they have no conflicts of interest.

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