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Assessing Readability of Patient Education Pamphlets in Training Hospitals in the City of Mashhad

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Abstract

Background: Patient education is taken into account as one of the key components of comprehensive care as well as one of the significant nursing functions in order to increase community health. In this respect, education materials and written texts can improve patient information up to 50% and consequently meet patient satisfaction. Readability is considered as an integral concept in patient education and an appropriate measure to determine how contents are perceived by readers.

Aim: The present study was to measuring the readability level of patient education pamphlets in training hospitals in the city of Mashhad.

Method: This study was a descriptive research conducted in 2016. In order to measure the readability level, the Simple Measure of Gobbledygook (SMOG) Readability Test was used. The study sample included 543 patient education pamphlets used by 11 training hospitals in the city of Mashhad along with pamphlets developed by the Office of Vice-Chancellor for Treatment Affairs that were collected through the census method. The SPSS16 software was also employed for data analysis. In terms of descriptive analysis, mean and standard deviation were used. In addition, Cronbach's alpha correlation test was employed for inferential analysis.

Results: The average readability level of patient education pamphlets was estimated equivalent to 11th grade (11.35±1.05). Moreover, the minimum and the maximum readability levels of the pamphlets were 9th grade and 15th grade, respectively.

Implications for Practice: The results revealed that patient education pamphlets available in training hospitals in the city of Mashhad were endowed with a high level of readability. Thus, the given pamphlets were appropriate to patients with a level of literacy equal to senior university students and they could not be perceived by the public. Considering the importance of readability index in health promotion and increased patient self-care, it was recommended to improve the readability level of patient education materials.

Keywords: Patient Education, Pamphlet, Readability, Readability Indices, Health Literacy

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Introduction

Patient education includes proper delivery of information in a way that accommodates an individual's educational needs in order to achieve health (1). Low-cost programs in this respect including health and medication education can help to improve patient health and make them more willing to accept or continue their treatment processes (2). Such education must be easily comprehensible and bring about changes in patient behavior (3).

Health literacy is the capacity to obtain the process and perception of general health information and the required services to make appropriate health-related decisions (4). Recent systematic investigations have confirmed that health literacy is at a low level and it has led to poor self-management in individuals which causes greater use of emergency departments and hospital beds. Evidence shows that many educational topics for patients with low levels of health literacy are too complicated. Such topics can be comprehensible only when patients with different levels of health literacy are able to receive and process key messages (5). In patient education, illiteracy is a problem often overlooked by nurses (6); in this respect, providing patient education is not enough by itself. According to reports, majority of patients can remember less than 35% of verbal information provided by health professionals. Such information may be also poorly understood by patients or some patients might refrain from asking questions and expressing their ignorance due to a sense of embarrassment. To resolve such a problem, written topics are used to complement and enhance verbal ones. Such information should be at a level that can be easily read and written. Otherwise, they cannot facilitate patient learning. Determining whether the written topics are appropriate for patients depends on their level of literacy as well as the readability level of the written materials (1). Functional literacy refers to an individual's ability to read and manage the required daily life activities. People are living with different levels of literacy in industrial and non-industrial countries. There is also a relationship between individuals with low levels of literacy and increased risks of being affected by illnesses. Such a correlation indicates the fact that people with low literacy skills are more likely to have less access to well-written topics that are developed for this target population. As a result, individuals with poor reading skills may not be informed of the details of their illnesses and overlook their health. This problem may be accompanied by weak interactions between individuals and healthcare providers because of embarrassment and shame (1). If the objective is to benefit patients with written information properly, the topics should be clearly written and include a logical organization, expressive language, and readability (7). Using educational topics written in a plain structure and their perception are potentials to improve the ability of patients and their families in terms of self-care which can result in improved care especially in patients with limited levels of literacy (8).

The concept of readability can be described as features of the written topics that make reading a text hard or easy. Readability can be measured by a number of different formulas that is determined by sentence length and number of words. Well-designed patient education topics can greatly improve patient education and ultimately patient care. It is a simple strategy to increase the use of written educational topics (4). Research studies have shown that people are more attracted to information that is well-written and associated with verbal explanations. Studies have also revealed that many written educational topics in the field of health are not endowed with an appropriate readability level for people with lower levels of literacy (9). For example; in the study by Arian and others (2016), level of literacy in patients was in 6th grade and the readability of education pamphlets was at university level (10). As well; in the research study by Ahmadzadeh (2013), the literacy level of diabetic patients was at a borderline level and the readability of patient education materials was at a difficult extent. The perception of patients had also increased after revisions and reductions in readability (11). It was argued that educational topics needed to be accurate and reliable and also based on the accuracy and readability that was associated with effective comprehension (12). In this regard, Doak and others recommended that the readability level of educational topics should be in 6th grade or lower (13). Even adults with higher levels of literacy prefer complex medical information presented in a simple form because it helps them to understand the materials better (2). Given the increasing level of literacy in society, most healthcare organizations have suggested the promotion of the readability of patient education topics from 6th grade to 8th grade 8. However, lots of patient education topics are being written in an advanced form and they cannot be understood by a significant proportion of patients (14). So far, numerous research studies have been conducted into the readability of patient education topics. For example; in a study, the average readability for educational topics was equal to

9.4 which was higher than average reading skills in adults (15). In the investigation by Chenlu Tian (2014), the average readability for educational topics associated with colon cancer was estimated to be equivalent to 10 or higher (16). Balakrishnan (2016) also examined the readability of online educational topics related to diverticulitis. The readability level of the topics was classified from 10th to 16th grades and levels of perception in patients changed from 31% to 74%. This indicated a strong and negative correlation between readability and patient perception of educational topics (17). Likewise, Eltorai (2016) investigated the readability of online topics related to the spine from three websites and estimated their grades equal to 10.7. Compared with the grade obtained in 2008, the readability level had improved from 11.5 to 10.7 in this respect. In this study, a significant improvement was only observed in one of the websites out of the three websites investigated (18). In another study, Hadden (2016) downloaded educational topics related to patients with hand surgeries from the website of www.handcare.org. The average readability was equal to 9.3 which had reduced compared to the previous study in 2008 with an average readability level of 10.6. However, the readability level of the current sample was reported to be greater than the given level (19). Eltorai (2016) also examined the readability of topics related to bone injuries and fractures from a patient education website by using the Flesch-Kincaid formula. The average readability level of these topics was equal to 8.8 and all the topics other than three had a readability score higher than 6th grade (20). Online education topics associated with tuberculosis disease cycle using five readability indices was also investigated by Mcclure (2016). The readability level of all topics was beyond the average literacy level of the Americans (21). Joseph (2016) measured online patient education topics related to hearing aids behind the ear using indices such as Gunning-Fog, New Fog Count, Raygov Estimate Graph, SMOG, and Flesch Reading Ease Score and estimated their average readability equal to 10th grade that was higher than the level recommended by the National Institutes of Health (22). In the study by Gulati (2016), the average readability level of online patient education topics related to hepatitis and its complications was estimated equivalent to 10.23 (23). Similarly, Boles (2016) investigated all the patient education topics in the field of dental health in newspapers and magazines published between 2000 and 2014 using the Flesch-Kincaid Index and estimated their readability equal to 9.15 (24). Correspondingly, Cajita (2016) did an analysis on online topics related to heart failure from 46 websites and estimated their readability score by 12.6 (25). In this respect, Balakrishnan (2016) also analyzed online materials related to vocal cord paralysis. The results revealed a readability level between 9th and 17th grades and the levels of perceptions in patients were from 29% to 82%. These showed that the higher the readability of patient education materials, the lower the levels of perception in patients (26).

Considering the experiences of the researchers in this study, making changes in the pamphlets used in the city of Mashhad seemed of utmost importance. Therefore, the present study was to analyze the readability level of published patient education pamphlets in training hospitals in the city of Mashhad.

Methods

The present study was a descriptive research measuring the readability level of patient education pamphlets in 2016. The study sample included all patient education pamphlets in 11 training hospitals in the city of Mashhad (Imam Reza Hospital, Khatam al-Anbia Hospital, Dr. Shariati, Hospital, Shahid Hasheminejad Hospital, Ghaem Hospital, Omid Hospital, Dr. Sheikh Hospital, Taleghani Hospital, Kamyab Hospital, and Montaserieh Hospital). After receiving a letter of introduction from school officials and coordination with all educational supervisors at the given centers, all the patient education pamphlets equal to 543 cases were collected through the census method. These materials had been developed by healthcare personnel working in the given centers and distributed among patients. 94 pamphlets out of the total number of pamphlets had been prepared by students of the School of Nursing and Midwifery in Mashhad and they were used jointly in training hospitals in the city of Mashhad following their approval by competent professors, the Scientific Committee of Patient Education and Office of Vice-Chancellor for Treatment Affairs. Among the 11 training hospitals, Hasheminejad Hospital was using all the pamphlets distributed by Office of Vice-Chancellor for Treatment Affairs to train the patients. Following the separation of pamphlets developed by the Office of Vice-Chancellor for Treatment Affairs in other hospitals, the readability of other pamphlets was measured via the SMOG Index. The readability of pamphlets developed by the Office of Vice-Chancellor for Treatment Affairs was also separately measured through this index. To

examine the difficulty level of written materials, there are more than 40 formulas. Currently, the SMOG formula is used as the most comprehensive formula to determine the level of difficulty of written materials in different languages. In this study, the difficulty level of each pamphlet was investigated in terms of readability through the SMOG Readability Formula as the most comprehensive formula employed to determine the level of difficulty of written materials. The given formula is associated with other relevant formula and it can be used with confidence to determine the amount of simple written materials in terms of readability and reading comprehension. This Formula can be employed in different languages and the only difference is the one in the scores obtained in one language compared to those for other languages (27). Therefore, the level of difficulty in the written materials can be compared in a language with other languages. At present, most educators make use of such a formula to measure the level of difficulty in written materials. The present study was conducted by an expert nurse. To use this formula, the pamphlets were firstly classified into two groups: short and long. Pamphlets containing more than 30 sentences were named long pamphlets and those with less than 30 sentences were called short pamphlets. To this end; 10 sentences at the beginning, middle, and end of the selected text, number of words with three syllables or so in 10 pamphlets were counted. Then, the SMOG conversion chart was used to determine the grade of the readability level. In terms of short pamphlets, the number of sentences in each text and then the number of words with three syllables or so were counted. In the next step, the number of sentences in the text was divided by 30 and the number obtained was multiplied by the number of words with three syllables or more. The majority of studies in this respect confirmed that the written materials were required to be at 6th grade and below.

Results

A total number of 543 patient education pamphlets were collected from 11 training hospitals in the city of Mashhad. These pamphlets were encompassed different field including internal diseases, respiratory problems, gastrointestinal disorders, cardiovascular diseases, mental illnesses, blood diseases, hepatitis, cancer, dialysis, neurology, women's diseases, childhood illnesses, eye diseases, medicine consumption, nutrition, and the like.

The average readability of these education materials was equal to 11.35 and the standard deviation was estimated by 1.05. The minimum readability of the materials was 9th grade and the maximum readability was 15th grade (Table 1 and Figure 1).

Moreover, the results of the one-way analysis of variance (ANOVA) showed a significant difference in mean scores for the readability of education pamphlets in 11 training hospitals in the city of Mashhad (P<0.001) (Table 2).

Figure 1: The readability of patient education pamphlets divided based on training hospitals in the city of Mashhad

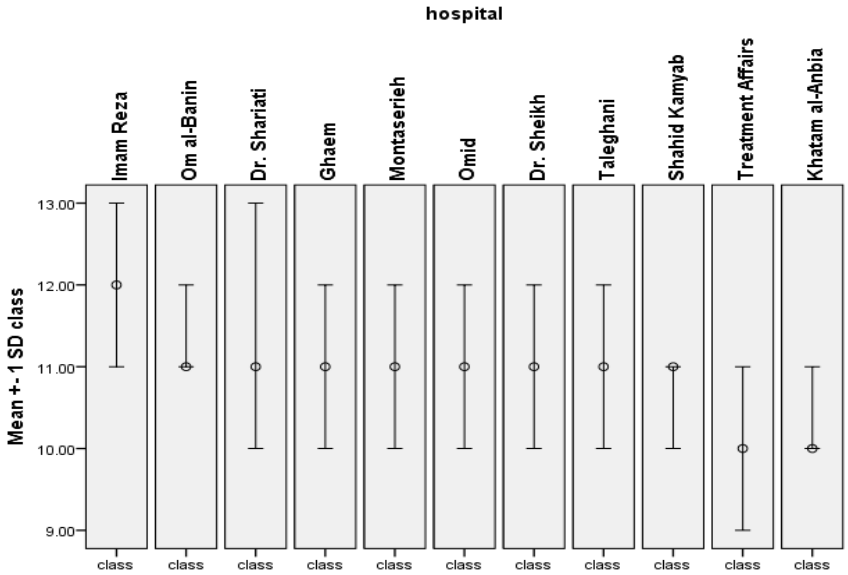

Table 1: The average readability of patient education pamphlets divided based on training hospitals in the city of Mashhad

Hospital	Number	Mean ± Standard Deviation	Minimum Readability	Maximum Readability
Imam Reza Hospital	61	12.2±1.01	10.00	15.00
Ghaem Hospital	84	11.1±0.9	9.00	14.00
Montaserieh Hospital	75	11.3±1.1	9.00	15.00
Omid Hospital	24	11.1±1.1	9.00	15.00
Dr. Sheikh Hospital	73	11.5±0.8	10.00	15.00
Taleghani Hospital	26	11.3±0.7	10.00	13.00
Shahid Kamyab Hospital	28	11.0±0.8	9.00	12.00
Office of Vice-Chancellor for Treatment Affairs	94	10.7±0.8	9.00	13.00
Khatam al-Anbia Hospital	22	10.8±1.1	10.00	12.00
Om al-Banin	15	11.6±0.4	11.00	12.00
Dr. Shariati Hospital	41	11.9±1.1	10.00	14.00
Total	543	11.3±1.0	9.00	15.00

Table 2: Results of ANOVA for patient education pamphlets divided based on training hospitals in the city of Mashhad

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	115.469	9	12.830	13.889	.000
Within Groups	492.346	533	.924		
Total	607.816	542			

Discussion

The results of the present study revealed that majority of the pamphlets published in training hospitals in the city of Mashhad had been written at a level appropriate to patients with a literacy level equivalent to senior university students and they were not comprehensible for the public. Among the hospitals, pamphlets of Imam Reza Hospital had the highest readability due to their use of complicated and difficult words, long sentences, as well as heavy content. Pamphlets prepared by the Office of Vice-Chancellor for Treatment Affairs had the lowest readability level because of their simpler words and shorter sentences. The grades assigned to the readability of pamphlets in other hospitals were almost identical. The distribution of patient education topics should be generally investigated in terms of its compatibility by patients and families with low levels of literacy. Furthermore, most people have a literacy level at least two grades lower than the last grade spent at school that is why the emphasis is on patient education pamphlets at 6th grade or below (28, 31). The National Cancer Institute and the Research Group for America's Medical Center also determined the readability level at 6th grade (31). By maintaining readability at a lower level, a greater part of the patient population is able to understand health information provided (29, 30). Along with the present study, other research studies have been also conducted highlighting that patient education materials were developed at a higher level than that in public. In the study by Arian and others (2016), literacy levels in patients was estimated at 6th and 7th grades (lower-secondary school) and the readability level of education pamphlets was at college level (10). In the study by Khosravi (2014), the literacy levels in diabetic patients referred to healthcare centers in the city of Shiraz was at a borderline level and the readability of patient education materials was at a difficult extent. The readability of articles was reported to be over 7th grade and at a difficult level in the study by Tiffany (2008) (32). In the investigation conducted by Carol Shieh (2008), the readability level of patient education topics was at 9th grade (33). In the study by Polishchuk, the readability level of online materials related to orthopedics was at 11th grade, only 2% of the materials were as 6th grade, and 18% of the materials were at 8th grade or below (31). In the study by Maghsudi (2013), the readability of patient education pamphlets was at 11th grade and only 1.2% of pamphlets were at the recommended readability level equal to 6th grade or lower (34). Ahmadzadeh (2012) in a study estimated the readability level of patient education materials at a difficult extent (the first years of university) (11). These research studies showed that the readability of patient education materials was not comprehensible for a magnitude part of target population and their full perception required university education.

Research studies have also shown that literacy level could not provide an accurate reflection of the reading skills in patients. For example, in a study in this respect, participants had an average literacy level of 11th grade but their reading skills were at 7th or 8th grades (8). Therefore, it was argued that education should be based on patients' reading skills. In addition, health literacy affects health-related behaviors. The findings of a study indicated that patient education pamphlets were 4 to 8 levels higher than the recommended ones (12). According to the results of a study in Australia, patients preferred educational topics written in plain language and those with a readability of 8 or lower while 53-90% of patient education topics had been written at 9th grade or higher. Moreover, there was a relationship between people with low literacy levels and increased risks of associated diseases. This relationship reflected the fact that the written education topics had not been developed for people with low literacy and skills (7).

The results of the present study showed that the existing patient education materials had a high level of readability (Figure 1) and the bulk of education materials were written at a level whose comprehension was difficult for the majority of target population. Therefore, there is a need to improve the readability level of these materials in a manner that they are comprehensible for adults with a low level of literacy.

Implications for Practice

In general, the study showed that the readability level of most patient education pamphlets used in the training hospitals in the city of Mashhad was higher than the recommended one. Therefore, the results of this study helped those involved in patient education programs and health information providers to focus on the improvement of the readability of patient education materials through considering the conditions of different target populations including the elderly and those with low level of literacy. On the other hand, there is a wide gap between reading skills in patients and readability of patient education topics although the patient education topics have increased over time. Thus, healthcare systems must adopt a proper and dynamic management model for planning and developing patient education pamphlets. To this end, the level of awareness in healthcare providers about the importance of patient education topics and health literacy levels in patients must be enhanced. It should be noted that increased awareness in terms of the issue of "readability" is possible through continuous training, educational workshops, lectures, and also the inclusion of this issue in the curriculum of nursing students. Similarly, patient education topics should be endowed with an acceptable readability and based on feedbacks obtained from patients. Therefore, adopting a multifaceted approach using the tools available to enhance readability and patient perception of health-related topics will be promising in terms of the improvement of patient information and clinical outcomes.

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Conflict of interest

The authors declare that there is no conflict of interest.

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