Functional Health Literacy andAssociated Factors amongEgyptian Hospitalized Patients: A Cross-Sectional Study

Naglaa F.A. Youssef[1](MSc, PhD) and Hanan A. Al Sebaee[2] (MSc, DNS)

[1&2](Medical Surgical Nursing, Faculty of Nursing, Cairo University, Egypt)
[1](Medical-Surgical Nursing Department, College of Nursing, Princess Nourah bint Abdulrahman University,
Kingdom of Saudi Arabia
Corresponding Author:Naglaa F.A. Youssef[1]

Abstract:
Background: Over the past few decades, studies of Functional Health Literacy (FHL) have increased dramatically. However, information about the health literacy of Egyptian patients remains scarce. Aim: This study aimed to evaluate the FHL and associated factors among Egyptian Hospitalized Patients. Methods: A cross-sectional survey was conducted over a period of six months in a selected university teaching hospital in Cairo, Egypt. A convenient sample of 280 adult patients was participated. Three measurements were utilized in this study together with the demographic data questionnaire: (i) The Short version of the Test of Functional Health Literacy in Adults (S-TOFHLA), (ii) Rapid Estimate of Adult Literacy in Medicine (REALM-R) and (iii) The CHEW scale. Results: the mean age of the participants was 40.48±SD 16.81 years. Most of them were males (63.6%), married (59.3%), and educated (67.7%). The mean score of the health literacy using S-TOFHLA was 18.84±11.21 and the median was 19; 57.1% of the participants had inadequate or marginal health literacy level. The REALM indicates that the participants reading ability was adequate (Median 11); 15.4% of participants had low reading ability score. Using the CHEW scale, 23.9% % had no or low confidence filling out medical forms by themselves, 41.1% does not or little have someone to read materials and 32.2% had problems learning their medical condition. The multiple regression test indicated that age (t=3.76, p=0.000), education (t=2.69, p=0.008) and presence of comorbidity (t=2.03, p=0.04) predict patients' REALM-R score, while the STOFHLA is only predicted by education (t=2.24, p=0.03). Conclusion and recommendation: The level of health literacy among the study participants was low. Healthcare providers should assess the patients' health literacy in order to tailor their communications and related health teaching materials.
Keywords: *Functional Health literacy, reading ability*

I.   Introduction

The delivery of health information in a way that patients are empowered to understand their health condition and how to deal with is a critical issue. Health information helps the patients to understand their needs, offers them a chance to be engaged in the disease management process, and to take the appropriate health decisions. Health information can reduce the patients' anxiety and improves their health and well-being [1]. Regardless of the patients' disease, they must be able to understand and follow basic health and nursing instructions regarding their care [2].Several factors, however, might affect patients' ability to process health instructions [3] such as health literacy (HL) level. Health literacy has been found to limit patient's understanding of their condition or instructions in several [4,5]. It is now recognized as an important predictor of people's health status and other health outcomes [6,7], their adherence to official health-related and treatment recommendations [5], and medical costs [8]. Low levels of health literacy are also associated to increased morbidity and mortality [6,9].

Lack of adequate literacy skills have been found by previous studies as an important barrier to receiving proper health care or given informed consent. Patients are routinely expected to read and understand labels on medications containers, appointment slips, informed consent documents, and health education materials; however these materials have been found exceeding the patients' literacy level [10,11].The Functional Health Literacy (FHL) term is originated from the literacy concept, to be more suitable to be used in the health context and health care [1]. The Functional Health Literacy term has been defined as "skills that allow an individual to read consent forms, medicine labels, and health care information and to understand written and oral information given by physicians, nurses, pharmacists, or other health care professionals and to act on directions by taking medication correctly, adhering to self-care at home, and keeping appointment schedules" [12, p4]. Health literacy has been also defined as the degree to which individuals have the capacity to obtain,

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process, and understand basic health information and services needed to make appropriate health decisions [13,14].Health numeracy, a subset of overall health literacy, and is defined as the degree to which individuals have the capacity to assess, process, interpret, communicate, and act on numerical quantitative to make effective health decisions related several health tasks, such as understanding risk/benefit information, understanding food labels, management of weight, interpreting blood glucose result and/or blood pressure levels [15,16]. Patients who are required to self-manage an illness and who have poor numeracy abilities are at risk for having poorer health outcomes [17].

Although FHL is still a debated issue and statistics about its prevalence are limited, the association of health literacy with health outcomes is widely accepted, and it is considered as an empowerment tool to reduce the health inequalities in vulnerable groups [18]. Research has indicated that people are not well equipped with HL skills and many children, adolescents and adults have limited literacy skill, even in economically advanced countries with a strong education system [19].People with low levels of HL had worse health outcomes than those with higher levels of HL as they had less information on their diseases, poor self-management skills, low screening levels, low levels of adherence to health-related and treatment recommendations, and higher hospitalization rates [4-6]. Patients with high HL are more liable to prevent and manage their disease than patients with inadequate HL [6,20]. Given that, HL is important in health promotion and self-management of disease [20]. Despite teaching endeavors, nurses are constantly faced with patients who do not understand how to manage their healthcare regimen [21].

1.1 Significance of the Study

There are still nearly 759 million illiterates in the world, 17 million of them living in Egypt [22]. Although the year of 2003 to 2012 has been declared as the United Nations Literacy Decade, there are still nearly a billion adults of the world's population illiterate with at least 600 million of them being women and over 70% of them living in Bangladesh, Brazil, China, Egypt, India, Indonesia, Mexico, Nigeria and Pakistan [23,24].

Patients need to be taught relevant information that must be delivered at a level they can understand. It is proved that patients who feel that they are well informed more likely to be satisfied with provided health care. Hence, nurses' awareness of these patients' health literacy will help in identifying their health needs that can help in providing optimal health teaching and discharge plan of care [25]. In the context of patient education, thus, it becomes imperative to assess patients' health literacy level in order to offer tailored instructions and maximize their learning.

Over the past few decades, studies of HL have increased dramatically. However, there is still a lack of evidence about the health literacy of Egyptian patients and its associated factors. Hopefully this study will be an important milestone in knowing more about health literacy level of those patients whom accessed university teaching hospitals. In addition, as nurses were engaged critically in patient education, the study findings will enhance the nurses' understanding of hospitalized patients' HL level and associated factors, which provide a foundation data for patient teaching, facilitate learning and help in tailoring the appropriate teaching materials and discharge instructions.

Aim and Research Questions

The aim of the current study was to evaluate the functional health literacy and associated factors among Egyptian hospitalized patients.
To fulfill the study aim, two research questions were formulated as follows:
1. What is the prevalence of inadequate health literacy among the study participants?
2. What are the factors associated with health literacy among the study participants?

II. Material and Methods

a. Design
A cross-sectional survey was conducted over a period of six months between August 2017 and January 2018 in Cairo, Egypt.

b. Population and Sample
A convenience sample of 280 adult patients, who were admitted to one of the medical, surgical, orthopedic, urology, or blood disorders wards, was participated.

Inclusion criteria
Patient was eligible to participate if: age 18 years or older, admitted in the inpatients wards, conscious, able to read and write or has relative who can read and write and give consent to participate.

c. Setting
The study was conducted in the medical, surgical, orthopedic, urology and hematology wards (N = 10 wards) at a university teaching hospital in Cairo.

d. Measurements

Three measurements were utilized in this study together with the demographic data questionnaire:
The Short version of the Test of ***Functional Health Literacy in Adults (S-TOFHLA)*** was used to assess participants' functional health literacy and, in particular, their reading skills. The S-TOFHLA is a 36-item reading assessment tool that takes up to 7 minutes to administer. The reading part contains 36 items divided into: (1) instructions for preparation to have an upper gastrointestinal tract radiographic (16 items in total) and (2) Medicaid (insurance) rights & responsibilities (20 items). The participant should choose the most appropriate answer to fill the blank from a list of four options. Each correct answer was scored with 1 point, while every incorrect answer with 0 points, for a total possible score ranges from zero to 36 [26]. According to the score, health literacy can be classified into three levels: (i) inadequate functional health literacy [0–16]; (ii) marginal health literacy [17–22], or (iii) adequate functional health literacy [23–36]. Patients with scores comprised between 0–16 often misread the simplest materials, including prescription bottles and appointment slips, patients scoring 17–22 perform better on the simplest tasks but have difficulty comprehending more complicated passages such as instructions for a radiographic procedure or educational brochures, and patients scoring 23–36 successfully complete most tasks [27]. The Arabic S-TOFHLA's validity was established[28].

The Rapid Estimate of Adult Literacy in Medicine (REALM-R) is a brief screening instrument that was used to assess the participants' ability to read, in order to identify patients who are at risk for poor health literacy skills. Fadda et al., [28] validated REALM-R in Arabic. Participants were asked to pronounce 11 medical words. The test takes less than two minutes to administer and score. The scoring system suggested by Bass et al., [29] was adopted; 1 point was given for each correct answer, with a final score of 11.

The CHEW tool was sued to identify low health literacy patients [30]; it has three questions where the participants were asked to: (1) rate their confidence in filling out medical forms, (2) the frequency for which they need help reading hospital materials, and (3) how often they experienced problems learning about medical conditions due to reading comprehension difficulties. The response to each question on likert scale: all the time, most of the time, sometimes, little of the time or not at all. CHEW scale took approximately 5 minutes to complete; it is valid and reliable tool [30].Official permission to use the instruments was obtained from the authors.

2.5 Ethical Consideration

The Research Ethics Committee of the Faculty of Nursing at Cairo University approved the study. All the participants were informed that all their data will be treated confidentially and in anonymous form and their withdrawal from the study will be possible at any time without any consequences. All the participants gave their informed consent after that before completing the study's instruments.

2.6 Statistical Data Analysis

Data were tabulated and analyzed using the Statistical Package for the Social Science (SPSS)-Version 20 (IBM: Armonk, NY, USA). Pearson's correlation coefficients were computed to assess the association between the health literacy instruments and other known predictors of health literacy, such as age and education.A linear regression model was used to estimate of the relationship between the S-TOFHLA and socio-demographic variables such as age, gender, education and presence of a chronic condition. The statistical significance level was set at $p<0.05$.

III. Results

Results of the current study are presented in three sections; the1[st] section is related to characteristics of the study participants, and the 2nd section is directed to answer the first question and the 3rd section is directed to answer the second question.

Section 1: Characteristics of the Participants

As shown in table (1) the mean age of the participants was 40.48±SD 16.81 years. Most of them were males (63.6%), married (59.3%), and educated (67.7%). The participants who were uneducated (32.3%) and did not prefer to self-complete the questionnaire (14.5%); their relatives assist them to complete (46.8%) it by reading the questionnaires' items during attendance of the researcher for any clarifications. Most of the participants (58.2%) were recruited from the surgical sections and 26.1% had comorbidity.

TABLE (1): PARTICIPANTS' CHARACTERISTICS AND RELATED MEDICAL DATA (N = 280).

Variable	N	%
Age (X±SD)	40.48±16.81	
Length of hospital stay (X±SD)	14.41±26.89	
Gender		
Male	178	63.6

Variable	N	%
Female	102	36.4
Marital status		
Single	93	33.2
Married	166	59.3
Divorced	7	2.5
Widowed	14	5.0
*Education level (n=279)		
Cannot read or write	90	32.3
Can read and write (prim, prep school)	80	28.7
Secondary or diploma	86	30.8
Higher education	23	8.2
Who completed the questionnaires		
Patient	149	53.2
Relative	131	46.8
Data collection setting		
Medical wards	117	41.8
Surgical wards	163	58.2
Comorbidity		
Yes	73	26.1

*Education level (n=279) means one case missed

Section 2: The Prevalence of Inadequate Health Literacy
Table (2) shows that the level of health literacy among the study participants was low. The mean score of the health literacy using S-TOFHLA was 18.84±11.21 and the median was 19 (actual range 0–36). Of the 280participants, 57.1% had inadequate or marginal health literacy level. However, using the Rapid Estimate of Adult Literacy in Medicine (REALM) indicates that the participants reading ability was adequate (Median 11). Number of participants who had low reading ability score was 15.4%.The Pearson correlation between REALM-R and S-TOFHLA is 0.40, p = 0.000.

TABLE (2): THE PREVALENCE OF INADEQUATE HEALTH LITERACY AMONG THE STUDY SUBJECTS USING S-TOFHLA (N = 280)

Variable	N	%
S-TOFHLA* total score		
• Range	0-36	
• Mean ±SD	18.84±11.21	
• Median	19	
Health Literacy Level		
• Adequate	120	42.9
• Marginal	39	13.9
• Inadequate	121	43.2
REALM-R*		
• Inadequate literacy	43	15.4%
• Adequate literacy	237	84.6%

*Short Version of the Test of Functional Health Literacy in Adults (S-TOFHLA), Rapid Estimate of Adult Literacy in Medicine (REALM-R)

Using the CHEW scale, 23.9% % had no or low confidence filling out medical forms by themselves, 41.1% does not or little have someone to read materials and 32.2% had problems learning their medical condition (Table 3).

TABLE (3): THE PREVALENCE OF INADEQUATE HEALTH LITERACY USING CHEW SCALE (N = 280)

CHEW Scale	All the time	Most of the time	Sometimes	Little of the time	Not at all
	N (%)	N (%)	N (%)	N (%)	N (%)
• How confident are you filling out medical forms by yourself?	82 (29.3)	62 (22.1)	69 (24.6)	55 (19.6)	12 (4.3)
• How often do you have someone help you read hospital materials?	36(12.9)	35 (12.5)	94 (33.6)	42(15.0)	73 (26.1)
• How often do you have problems learning your medical condition?	43(15.4)	55(19.6)	92(32.9)	47(16.8)	43(15.4)

Section 3: Factors Associated with Health Literacy
Using the multiple regression test (enter mode) indicated that age (t=3.76, p = 0.000), education (t=2.69, p = 0.008) and presence of comorbidity (t=2.03, p = 0.04) predict patients' REALM-R score, while the STOFHLA is only predicted by education (t=2.24, p=0.03). However, gender and length of hospital stay were not associated with literacy level.

IV. Discussion

Previous studies show that people who have poor health literacy more likely to become sick, engage less in screening programmes and seek health services in more advanced stages of disease; moreover, they are less conscious of their health status and the therapy they are following [6]. Individuals with low health literacy had significantly higher rates of chronic disease such as hypertension and arthritis. Older individuals with low health literacy had higher limitations in activity and lower perceived health status [31]. However, no clear prevalence regarding health literacy was documented among Egyptian population specifically hospitalized people. Thus, this study aimed to evaluate the functional health literacy and associated factors among Egyptian hospitalized patients in a selected university teaching hospital in Cairo.

Participants' Characteristics

The current study showed that the participants' mean age was 40.48±16.81 years and the duration of their hospital stays was14.41±26.89 days. Most of them were males, married, and educated. Approximately one third of the participants were uneducated and less than half of them could not complete the questionnaire by themselves. Therefore, their relatives assist them to complete it by reading the questionnaires' items during attendance of the researchers for any clarifications.

More than half of the participants were recruited from the surgical sections and about one fourth had comorbidity. The study findings are partially similar to previous studies' findings [4], who reported that the average age of the participants was 39.42±11.21 and about three fourth were married. However, according to the educational status, the findings were in contrary with what was found in the current study as all the participants were educated (from elementary school to master's degree).

Health Literacy Level

The current study findings regarding the high prevalence of inadequate functional health literacy, as measured by S-TOFHLA, are consistent with the recent published national [32] and international [18,33] studies. For instance, the only identified Egyptian study, which aimed to assess health literacy among outpatient clinics attendees at Ain Shams University Hospitals [32] found 81% of the participants had limited comprehensive health literacy (CHL) {34.3% inadequate and 46.7% problematic}, while only 18.9% had sufficient CHL. Regarding the functional health literacy (FHL), it was found that 84% had limited FHL (50.6% inadequate and 33.4% problematic), while only 16.1% had sufficient FHL.

A Community-Based Study in China similarly found 84.49% of the residents had low health literacy [33] and in South Asians, 61% have limited health literacy [18]. Moreover, in the UK, Protheroe et al., [34] found 28.5% had low literacy, 23.5% had marginal and 48.0% had adequate health literacy. However, other studies in contrast reported that 86.3% of the participants had adequate functional health literacy, 7.5% had marginal, and 6.3% had inadequate health literacy [35]. Additionally, Giuse et al., [2] reported that 83.7% of the subjects had adequate health literacy, 8.7% had marginal, and 7.7% had inadequate health literacy. The discrepancy of the findings might be due to the differences of the participants' demographic characteristics as well as their education level or tools used to assess literacy.

According to the recent studies, it seems that there is high prevalence of inadequate health literacy whatever the education level or reading ability of the participants. For instance, although all the participants in the study by Çaylan et al., [4] were educated (from elementary school to master's degree), the health literacy level was low among most of them. In our study the participants had adequate reading ability (using the REALM), where less than one fifth had low reading ability score. Interestingly, the moderate correlation between the REALM-R and S-TOFHLA suggest an overlapping between the two tools, however each one measures different demission of literacy. The REALM-R measures the reading ability while the S-TOFHLA assesses the comprehension health literacy. Therefore, it is logic to find most of the participant although they could read; they had low health literacy.

Factors Associated with Health Literacy

Regarding factors associated with health literacy, the study finding revealed that age, education and presence of comorbidity predict patients' the participants reading ability using the REALM-R tool, while the comprehensive health literacy using STOFHLA is only predicted by education. This result is logic since participants with low health literacy were more likely to be less educated as previous studies [4,36]. The prevalence of low health literacy was negatively associated with the level of education [33]. Additionally, increasing age, low education level, and low incomes, perceived poor health status and lack of access to the Internet are all associated with lower health literacy as previous studies found [34,36]. Similarly, findings of Bibi, [18] also suggest that people with certain characteristics, such as old age, females, low socioeconomic status, and people with limited or no formal education, are at a higher risk of inadequate health literacy. Interestingly, patients who have comorbidity in our study had higher reading ability; it might be attributed to

patients having preexisting knowledge and familiarity about medical terms than participants without comorbidities.

Gender and length of hospital stay were not associated with literacy level in this study. However, this result is on contrary with Almaleh et al., [32] who reported that the level of functional health literacy (FHL) is solely contingent upon gender. Also the level of comprehensive health literacy (CHL) relies on gender and education; participants with inadequate FHL were more likely to have inadequate CHL. Çaylan et al., [4] study' reported that there was a statistically significant relation between participants' gender and Adult Health Literacy Measure (AHLM) scores, where the females had higher mean AHLM scores. These inconsistency findings might be as a result to using different literacy measurements. For example, Almaleh et al., [32] used the Swedish Functional Health Literacy Scale and the European Health Literacy Survey Questionnaire-short version-were to assess HL. Moreover, Çaylan et al., [4] used Adult health literacy measure (AHLM) only for assessing the participants' health literacy.

V. Conclusion

Patients increasingly expect to act as proactive partners in the health care process. To optimize the delivery of health information, practitioners should be sensitive to all means of communication designed to enhance patients' knowledge of their conditions. Our study attempts to do so by providing an insight into health literacy as key elements for patient engagement in health care process.

VI. Implications and Recommendations

Based on this study finding we recommend the following:
For nursing practice
I.   Healthcare providers, particularly the nurses should assess the patients' health literacy before any health teaching or intervention program in order to tailor health teaching materials or health teaching delivery methods.
II. Health care providers should provide the patient-centered communication based on the health literacy level.
For research
1.   Further studies are required
2.   Future studies should include larger sample sizes to confirm this study's findings.
3.   Future research could be conducted in different geographical areas to critically assess the concepts involved in this study.
4.   Future research may also utilize other methods and tools of assessing health literacy levels.

Acknowledgements

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