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Hospital health literacy conceptual explanation: A qualitative content analysis based on experts and population perspectives

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Abstract:

BACKGROUND AND AIM: Given the complexities of the health care system and the importance of the subject and effects of health literacy in all aspects of care, defining specific health literacy in this context seems necessary. The purpose of this research was to explain the concept of hospital health literacy (HHL), its definition, and the related dimensions using the qualitative research method.

MATERIALS AND METHODS: An exploratory qualitative design was used. Exploratory, open-ended, and face-to-face interviews based on the interview guide were used to elicit participants' perspectives between July 2021 and January 2022. By using the content analysis method, researchers coded transcripts and collated these codes into sub-categories and then merged them into the main category and explored the dimensions of the concept.

RESULTS: A total of 23 service providers and 25 service recipients were included in the study. Analysis of qualitative data led to the identification of 6 categories and 25 sub-categories including *cognitive literacy*, *functional (basic) literacy*, *communicative literacy*, *behavioral literacy*, *media literacy*, and *emotional literacy*.

CONCLUSION: The findings of the present study provide a deep understanding of the concept of HHL that could be applied to develop valid and reliable measurement tools for assessing HHL among a variety of populations. Also, it is hoped that the present attempt can be useful to guide future research and interventions as well as to provide a clear base for planning, implementing, and evaluating interventions aimed at promoting individuals' health literacy in health settings.

Keywords:

Health care, health care providers, health literacy, hospital, qualitative research, recipients

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Introduction

As an independent determinant of health, health literacy is identified as "cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health."^[1-3] Low health literacy, directly and indirectly, affects health outcomes.^[4] As such, researches confirm the relationship between health

literacy and the social determinants of health.^[5] Multiple studies show that low health literacy is linked to restriction in individual, social, and cultural growth and ultimately affects health outcomes.^[6-9]

Low health literacy is a barrier to the use of preventive health measures, self-care, healthy behaviors, and the processes of shared decision-making (SDM) in medical interventions.^[10-12] Moreover, health literacy is independently associated with increased

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risk for emergency care and hospitalizations, prolonged recovery and complications, less management of chronic disease, poor adherence to medication regimen, less understanding of the preadmission medication regimen, physicians' recommendations, and ultimately increased mortality.^[13-15]

Responding to demands which are increasing in a complex society, the terms "health literacy" have been refined over the years and different health literacy studies have continued to bring up the different "types" of health literacy across time. The concept of health literacy is addressed in studies both in general and specific types.^[2] General health literacy implies all domains presented in the primary definition of health literacy and includes a broad range of populations. In contrast, specific health literacy is discussed which consists of topic-based and subgroup-based health literacy.^[2,16] Some researchers conceptualized health literacy and developed measurement tools for various populations, for example, patients with chronic diseases, cancer, diabetes, human immunodeficiency virus (HIV), and heart failure.^[17-19] Although several studies explored the concept of health literacy from the perspectives of different populations, health literacy in the context of service delivery has not been considered in any study.^[20] Moreover, people ordinarily engage in various health activities like promoting health, screening, seeking care, and treatment of diseases. These activities take place in various settings such as health care settings. People have to meet their literacy-related demands in a health care setting. They may encounter difficulties finding and receiving health care services, using materials, navigation, filling forms, and offering consent for procedures in complex health care settings like a hospital.^[21-23]

The results of previous publications indicate that low health literacy was associated with a longer hospital length of stay and hospital readmission.^[24-27] Furthermore, inadequate health literacy led to receiving lower quality and clarity of hospital communication.^[28] People with low health literacy have more problems with navigation in the health care system in dealing with complicated health information.^[21] Prior research has found that patients with low literacy experience insecurity and confusion in finding their way throughout health care facilities.^[29] It is noteworthy that in these studies, general health literacy has been considered and general health literacy tools have been used to assess.

We believe that general health literacy does not meet the needs of clients and patients in health care centers. Given the complexities of the health care system, defining specific health literacy in this context seems necessary that represents a combination of skills and knowledge that each patient needs to make the appropriate

health decisions in the setting of a hospital. This paper has considered the concept of health literacy in the context of a hospital as specific health literacy, which is a setting-based version of health literacy and can be considered the first attempt to introduce and explain the concept of hospital health literacy (HHL). Due to the importance of the subject and effects of health literacy in all aspects of care, this study was conducted using a qualitative approach to explain the concept of HHL, based on both service providers (expertise representative) and service recipients' (population-representative) perspectives. Regarding the literature review, it seems that this study is the first attempt in Iran, even worldwide to explain the concept of HHL, which could provide a deep understanding of the concept of HHL that could be applied for various purposes in research such as developing the valid and reliable measurement tools.

Methods

Study design

The exploratory qualitative research was conducted. The required data were collected through semi-structured, in-depth interviews with service providers and service recipients to identify dimensions of HHL and to define the concept.

Study setting and participant recruitment

The research was conducted in Tehran (2021), the capital of Iran. Service providers and service recipients were the two main subgroups who participated in this study. A wide range of key informants from service providers including physicians, clinical nurses, nursing managers, and hospital managers was selected. Service recipients including inpatients, outpatients, and visitants/relatives were selected through purposive sampling with maximum diversity such as age, gender, marital status, education, expertise, kind of hospital (governmental [public], private, and charity), and medical history (e.g., kind of disease).

The inclusion criteria for service providers were willingness to participate in the study; the target participants also were supposed to have at least one year of job experience in the hospital. For managers, at least one year of management experience was considered. The target participants of service recipients were supposed to have experience of hospitalization, receiving outpatient services, or being visitors to the hospital. Other inclusion criteria were age above 18 years and willingness to participate in the study. For those who were hospitalized, appropriate physical and mental status and the ability to communicate with the interviewer also were considered. A total of 23 service providers and 25 service recipients who met the inclusion criteria were included in the study.

Data collection

The semi-structured interviews were held in Tehran with service providers and service recipients. Exploratory, open-ended, and face-to-face interviews were used to elicit participants' perspectives on HHL. The interview guide was developed in two separate sections and its content validity was checked by the research team. The interviews started with main questions and were continued with detailed questions about achieving the research objective. The guided questionnaire is shown in Table 1.

We were confirmed the coding process and any disagreements were discussed by authors. Interviews and data analysis were conducted between July 2021 and January 2022. All procedures (before actual data collection) were approved by the Research Ethics Committee of the Faculty of Public Health and Safety at Shahid Beheshti University of Medical Sciences. After explaining the purpose of the study, the participants provided informed consent before the interviews. They were assured that their information would remain confidential and they had the right to withdraw at any time.

Eligible service recipients and service providers were selected from various hospitals in Tehran. Most interviews with service recipients were held in sickrooms and waiting rooms of hospitals where they felt comfortable and agreed. Interviews with service recipients who had been hospitalized in the past few months were conducted at their homes with prior appointments. Service providers were invited to a face-to-face interview through phone calls. The interviews were mostly held in the participants' workplace (hospital), after office hours or shifts. Eventually, 23 face-to-face interviews with service providers and 25 face-to-face interviews with service recipients were held and each of them lasted from 20 to 45 min. To confirm data saturation, an additional three service recipients and three service providers were interviewed with no new insights generated. To increase data gathering quality, with the consent of the participants, their voices were recorded. They were assured that their voices would be removed after the interviews were conducted.

Data analysis

Analysis followed the content analysis method by two researchers. The two researchers discussed the process of analysis approach before engaging in the process. The interviews were written and reviewed. Two researchers independently read the transcripts followed by code identification from significant phrases and sentence transcripts, collating these codes into sub-categories and then merging them into the main category. The two researchers compared their results and the process was reviewed several times. Toward reach a consensus on the final set of sub-categories and categories, two other researchers.

Trustworthiness

The four criteria of credibility, dependability, confirmability, and transferability suggested by Streubert and Carpenter were used to evaluate qualitative data.^[30,31] Prolonged engagement and persistent observation, triangulation, external checks, and searching for disconfirming evidence were considered to achieve credibility. Further, for confirmation of dependability, the stepwise replication by the research team and reviewing of the data by independent individuals were employed. The process of research and all activities were recorded for approval of conformability so that the whole research process will be clear and transparent to the readers. Sampling with maximum diversity and accurate description of participants, sampling method, time, and place of data collection were fully performed to approve transferability.

Ethics approval and consent to participate

All participants were fully informed about the study aims before any participation in research activities and they had the opportunity to ask questions throughout the study. Then, the participants signed a letter of informed consent in which it was clearly mentioned they are allowed to exit the study whenever they wish and for any reason. All data remained confidential and anonymized. Permission to take notes or record audio was obtained and audio files were deleted after research.

The project has been approved by the Ethics Committee of the School of Public Health and Neuroscience Research

Table 1: The interview guide for exploratory interviews with service providers and service recipients

To interview with service providers	To interview with service recipients
How is health literacy of a person defined in a hospital setting from your view?	What kind of literacy do you need in a hospital setting?
If we intend to consider some dimensions for hospital health literacy, you think what they could be?	What are the potential skills and capabilities you should have in a hospital setting?
Which skills and abilities do people need to overcome the complexities of the hospital environment?	Have you ever experienced confusion in a hospital setting?
What are the potential skills and capabilities one can have concerning hospital health literacy?	

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Results

Participants' profile

A total of 23 service providers and 25 service recipients were included in the study. In the group of service providers, 17 females and 6 males (ranging in age from 26 to 51, mean 40) with an average of 16 years of working experience participated. Service recipients were 11 males and 14 females. The details of the participants in this study are presented in Tables 2 and 3.

Resulting Themes

After the data analysis, 125 primary codes, 25 sub-categories, and 6 categories were extracted. The relevant information is summarized in Table 4.

1. Cognitive Literacy

This category refers to the knowledge required in a hospital setting. It has the 11 sub-categories of disease basic knowledge, follow-up knowledge, para-clinical services knowledge, hospital terminological awareness, protection and safety knowledge, costs and insurances awareness, patients' rights awareness,

hospital regulation knowledge, organizational knowledge, information comprehension, and information usage.

1.1. Disease Basic Knowledge

This sub-category pertains to people understanding of their disease, possible diagnosis, and the proposed treatment program. *"Those who are hospital health literate should have the required knowledge of the reason for hospitalization (for example surgical treatment), the progressing and the duration of treatment, the warning signs in their disease, their prescribed medications, the possible diagnosis, selected treatment method and alternative therapies"* [SR17, Male, A week ago, Endoscopy].

1.2. Follow-up Knowledge

This is referred to as preparing for discharge and outpatient follow-up post-discharge. *"Patients should need to aware of signs and symptoms that need to be reported to the service provider, medications that need to be taken at home and instructions for each, appointments that need to be arranged for clinic follow-up, recommendations and restrictions for the patient's care"* [SR20, Male, At the time of study, Patient attendant].

1.3. Para-clinical Services Knowledge

This is a knowledge related to para-clinical services, which are done for a variety of reasons, including screening, diagnosing a disorder, evaluating the severity of a disorder so that treatment can be

Table 2: Demographic characteristics of service providers (n=23)

Participant number	Age	Gender F: Female M: Male	Work experiences (Year)	Expertise	Position
S.P1	26	F	5	Bachelor of Science in nursing	Charge nurse
S.P2	50	F	20	Bachelor of Science in nursing	Health education and promotion supervisor
S.P3	34	F	11	Bachelor of Science in nursing	Registered nurse
S.P4	41	F	18	Master of Science in psychology	Head-nurse
S.P5	36	F	12	Bachelor of Science in nursing	Senior staff nurse
S.P6	45	F	20	Master of Science in medical education	Head-nurse
S.P7	43	F	16	Bachelor of Science in nursing	Infection control nurse
S.P8	50	F	23	General physician	Physician
S.P9	37	F	16	PhD in health in disasters	Office manager of quality improvement
S.P10	37	F	13	Master of Science in HSE	Quality improvement expert
S.P11	50	F	24	PhD in MBA	Dialysis nurse manager
S.P12	52	Fe	24	Master of Science in medical education	Nursing supervisor
S.P13	35	M	10	Bachelor of Science in nursing	Charge nurse
S.P14	35	M	5	Doctor of dentistry	Dentist
S.P15	36	M	16	Bachelor of Science in nursing	Charge nurse
S.P16	28	M	5	Master of Science in health care management	Charge nurse
S.P17	45	F	20	Forensic physician	Forensic doctor
S.P18	51	M	20	Cardiologist	Vice-chancellor of international affairs of the university
S.P19	40	F	10	PhD in nursing (Associate Professor)	Faculty member of the School of Nursing and Midwifery
S.P20	44	F	15	PhD in nursing (Associate Professor)	Faculty member of the School of Nursing and Midwifery
S.P21	45	F	18	General physician	Transplant coordinator
S.P22	37	M	12	Specialty in thoracic surgery	Thoracic surgeon
S.P23	32	F	5	ENT resident	Student

Table 3: Demographic characteristics of service recipients (n=25)

Participant Number	Age	Gender F: Female M: Male	Job Status	Literacy	Condition	Hospital Type Public Hospital: Pu Private Hospital: Pv Charity: Ch
S.R1	35	M	Employee	Master of Science in nanotechnology	Family member	Pu-Pv
S.R2	43	M	Employee	Bachelor of science in chemistry engineering	Patient- varicocelelectomy	Pu-Pv
S.R3	40	F	Housekeeper	Diploma	Patient- heart surgery	Pu-Pv
S.R4	35	F	Housekeeper	Fifth elementary school	Family member	Pu-Pv
S.R5	35	M	Architect	Bachelor of science in architecture engineering	Family member	Pu
S.R6	60	F	Retired employee	Bachelor of science in English Language	Patient- heart surgery	Pv
S.R7	42	M	Self-employment	Bachelor of Art in Mathematics	Patient- thoracotomy	Pu
S.R8	33	F	Housekeeper	Diploma	Family member	Pu
S.R9	65	F	Housekeeper	Middle school	Patient- covid-19 ward	Pu
S.R10	40	F	Employee	Associate in literature	Patient- covid-19 ward	Pu
S.R11	30	F	Programmer	Bachelor of Science in computer engineering	Patient- LASIK eye surgery	Pv
S.R12	56	F	Housekeeper	Diploma	Patient- gastrointestinal ward	Ch
S.R13	30	F	University student	PhD candidate of health education and promotion	Family member	Pu-Pv
S.R14	32	F	Teacher	Bachelor of Science in microbiology	Patient- cesarean section surgery	Pv
S.R15	52	F	Housekeeper	Diploma	Patient- angiography	Pv
S.R16	42	F	Housekeeper	Bachelor of science in environmental health	Patient- chemotherapy	Ch
S.R17	46	M	Pharmaceutical Manager	Bachelor of science in agricultural engineering	Patient- endoscopy	Pv
S.R18	60	M	Retired employee	Diploma	Patient- radiotherapy	Pu-Pv
S.R19	65	F	Housekeeper	Middle school	Patient- neurology ward	Pv
S.R20	42	M	Pharmacy vendor	Diploma	Family member	Pu-Pv
S.R21	35	M	Clothing distributor	Associate in electronic	Patient- covid-19 ward	Pu
S.R22	39	M	Electronic distributor	Bachelor of science in Food industry Engineering	Family member	Pu-Pv
S.R23	55	M	Taxi driver	Fifth elementary school	Patient-endocrinology ward	Pu
S.R24	38	F	Psychoanalyst	Master of Science in psychology	Patient- covid-19 ward	Pu-Pv
S.R25	45	M	Optometer	Bachelor of science in optometry	Family member	Pv

planned, and monitoring the response to treatment.

"I think one who owns hospital health literacy should recognize the types of common diagnostic tests, the brief descriptions of each test and preparation for certain tests.

Also, the care after medical exams is so important" [SP6].

1.4. Hospital Terminological Awareness

Most participants mentioned that service recipients need to understand the terms used for specific practices, tests, and treatment by service providers.

"In my idea someone who possess HHL should recognize the simple terms used by service providers in conversations.

The jargons which commonly used by healthcare providers could lead to serious adverse consequences for patient' health. Patients who do not understand the simple medical terminology as "NPO" are at risk for errors" [SP10].

1.5. Protection and Safety Knowledge

This sub-category is concerned with the knowledge of self-protection in a high-risk and harmful situation in a hospital environment. *"Patients should know that how*

protect themselves from high-risk situation like falling and infection. For example, they need to learn how should raise side rails and how should get assist for high- risk situation like bathroom and toilet" [SP5].

"In my opinion service recipient need to know how keep themselves safe from infection like COVID-19 and reduce the risk of transmission of microorganisms in hospital" [SR17, Male, A week ago, Endoscopy].

1.6. Costs and Insurances Awareness

This refers to service recipients' clear understanding of insurance which is essentially unique to health care including the costs of care, insurance coverage, the amount of deductible (the amount paid out of pocket before insurance kicks in), and co-pay (the amount paid out of pocket after the insurance has kicked in).

"One of the essential which service recipient needs, is awareness of insurance coverage. they need to understand difference between Inpatient and outpatient cost and insurance coverage, also they should check out inpatient

Table 4: Categories, sub-categories, and samples of codes obtained from interviews

Category	Sub-category	Initial codes
Cognitive Literacy	Disease Basic Knowledge	Awareness of the disease (after diagnosis)
		Awareness of prescribed medications
		Awareness of the treatment process and the proposed treatment program
		Awareness of how the treatment is progressing and the duration of treatment
		Awareness of warning signs in the disease
	Follow-up Knowledge	Knowledge of drug and food allergies
		Knowledge of follow-up treatment after discharge
		Awareness of follow-up diagnostic tests after discharge
		Awareness of warning signs after discharge according to the type of disease
	Para-clinical Services Knowledge	Knowledge of taking the medications after discharge
		Familiarity with common diagnostic tests
		Awareness of the usual preparations before performing diagnostic tests
	Hospital Terminological Awareness	Knowledge of self-care after common diagnostic tests
		Familiarity with simple terms in treatment such as fasting, urine, and suppository
	Protection and Safety Knowledge	Knowledge of common terms for naming medical staff such as intern, resident, supervisor
		Awareness of the risk of oxygen explosion in the proximity of cigarettes
		Recognition of the dangers of falling in hospital
	Costs and Insurances Awareness	Knowledge of the risk of infection and the way of spreading in a hospital setting
		Familiarity with the risk of exposure to radiation and harmful substances in a hospital setting
Overall familiarity with insurance rules		
Awareness of support services		
Knowledge of insurance services for specific diseases		
Patients' Rights Awareness	Knowledge of insurance rules for inpatient and outpatient cases	
	Familiarity with supplementary insurance	
	Knowledge of insurance coverage, the amount of deductible, and co-pay	
	Awareness of the complaints process	
	Knowledge of patient's rights	
Hospital Regulation Knowledge	Awareness of how to follow up on complaints	
	Awareness of the right to choose treatment and informed decision	
	Familiarity with hospital's duties in providing medicine, services, and diagnostic tests	
	Familiarity with rules and regulations in hospital	
Organizational Knowledge	Awareness of the differences between the rules and regulations of governmental and private hospitals	
	Awareness of the differences between the rules and regulations of a teaching hospital and a non-teaching hospital	
	Ability to diagnose the treatment staff according to their uniform	
Information Comprehension	Capability to distinguish the teaching hospital from non-teaching hospital	
	Capability to distinguish the public hospital from the private	
	Ability to understand conditions; the benefits, risks, and potential complications of a procedure	
	Capability to understand patient education materials	
Information Usage	Capability to understand the care plans	
	Capability to apply health information provided by staff	
	Capability to apply for appropriate self-care education programs	
Functional (Basic) Literacy	Reading	The ability to read signposts and boards of directors
		The ability to read the informed consent form
		The ability to read patient education materials and brochures
	Writing	The ability to read self-care instructions and discharge instructions
		The ability to fill-out admission form
		The ability to fill-out discharge form
		Filling-out the informed consent form
	Calculating	Calculate health insurance costs correctly
		Calculating hospital bills correctly
		The ability to calculate the time of taking a prescription drug
		The ability to calculate the dose of prescription drug

Contd...

Table 4: Contd...

Category	Sub-category	Initial codes
Communicative Literacy	Interpersonal Communication	The ability to communicate with health care providers
		The ability to communicate with other patients
	Claiming and Negotiation	The ability to ask questions about treatment methods and side effects of selective treatment
		Demanding and asking for re-explaining the information
		The capability of complaining and pursuing
		Ability to request simple and clear explanations
	Involvement in Decision-Making	The ability to be involved in the decision-making process
		Refusing to impose treatment
	Information Offering	The ability to decide to undergo invasive procedures
		The ability to offer all health history information
Answering physician questions correctly		
Behavioral Literacy	Navigation	The ability to describe every sign and condition
		The ability to find the way in a hospital environment
		The ability to go through the admission process
	Hospital Related Self-care	The ability to go through the discharge process
		The ability to monitor and report changes in condition
		Taking care of drains and catheters
	Hospital Living	Participating in self-care such as bathing
		Using the call bell for asking help
		Appling sickbed safe and correct
		The ability to tend identification bracelet
Media Literacy	Technological Skill	Using communication technology like modern mobiles phone
		The ability to use patient education software
		The ability to apply QR codes to navigate in hospital
		The ability to use mass media, such as the internet to make online appointments
		Searching for relevant information through health websites
Emotional Literacy	Information Search and Acquisition	Searching and selecting appropriate and practical health information through hospital websites
		Accentuating to treatment processes
		Taking care of health by adherence to treatment
	Valuation of Health	Spending time on long-term diagnostic and therapeutic processes
		Internalization of Health Value
		Paying attention to choosing high-quality health service

expenses per day at hospital, surgical procedures' cost, rehabilitation services insurance coverage, private hospital room fees and intensive care room fees. Moreover, they should know that the degree of coverage may vary among insurers, some plans may not fully cover surgical costs and require them to pay out-of-pocket. they should consider that cosmetic treatments or any elective procedures that are not deemed medically necessary are generally excluded the insurance coverage" [SP17].

1.7. Patients' Rights Awareness

Some service recipients noted that they need to be aware of their rights especially critical issues of dignity and autonomy. "All patients need to aware of patients' rights and their role in medical decisions. Patients should know that it is their right to receive information from their physicians and discuss the benefits, risks, and costs of appropriate treatment alternatives. Someone who possess HHL should know that has the right to express complaints about the care and services received without fear of discrimination or reprisal" [SP8].

"Service recipients should be aware of their legal rights as a patient for example all healthcare services should

offered based on respecting human dignity and every individual has the right to receive a sufficient amount of desired information" [SR1, Male, 2 Months ago, Patient attendant].

1.8. Hospital Regulation Knowledge

This refers to the rules and regulations that patients should respect in hospitals and also the differences between rules and regulations in teaching and non-teaching hospitals or governmental and non-governmental hospitals.

"Service recipients who own acceptable HHL should know that rules and regulations in various hospitals are different for example teaching hospital organized for both medical educations and patient care while nonteaching hospitals are only responsible for medical duties" [SP10].

1.9. Organizational Knowledge

This sub-category is pertained to knowing the hospital as a complex organization. "Service recipients need to know about structure and function of hospital. For examples they should know about functionality of hospital and difference between general-purpose and specialty hospitals. Also, they need to distinguish different

professional groups (workforce) and diverse roles" [SP15]. "There are many medical specialties and subspecialties for health problems, so to avoid confusion and waste of time in hospitals, we need to aware of different choices" [SR15, Female, 1 week ago, Angiography].

1.10. Information Comprehension

This sub-category is concerned with understanding relevant health information provided to service recipients by health care providers. "People should be able to understand diagnostic and prognostic information that enables them to make informed decisions about his care. The informed consent process requires understanding of conditions; the benefits, risks, and potential complications of a procedure and treatment alternatives. They should be capable of understanding the care plans, which is described them and the importance of taking the prescribed medication. Finally, they need to be capable of understanding patient education materials" [SP22].

1.11. Information Usage

This is referred to the ways through which people personalize their health information and apply the offered information to manage their condition. "A person who know how can apply the information received and employ appropriate self-care programs such as how should care wound, how should use medication proper diet and physical activity" [SP11].

2. Functional (Basic) Literacy

This explored dimension involves three sub-categories: reading, writing, and calculating. This category refers to reading words and documents, which are related to health in a hospital setting. It also refers to one's capability of writing words and numbers and the capability to calculate whatever is related to drugs and self-care. Significantly, functional literacy particularly reading and writing ability, is latent in other categories.

2.1. Reading

This sub-category refers to the role of reading ability and health-related reading demands in a hospital setting.

"People need to reading ability for most of the task in health care setting. They should be capable of reading instructions for preparation for para-clinical test, and reading prescriptions and drug labels. They also need to be capable of reading health education brochures, self-care instructions, informed consent form, discharge instructions, insurance forms and paying medical bills and boards of directors" [SP2].

2.2. Writing

Some service providers emphasized that service recipients should be able to fill the forms that are critical and ubiquitous in a hospital setting. "In my point of view, one of the most important skills which people need in hospital setting is writing skill. some literate people are not capable to fill out hospital forms or need too much time filling out them because this is more complicated than

just the ability to write. They should be able to filling out complex forms like health history forms, insurance forms and paying medical bills" [SP12].

2.3. Calculating

This deals with math skills in relation to health literacy in hospital setting. "Math skill in hospital setting is not as simple as basic math. People need to be capable to calculate health insurance costs and hospital bills. they also need to figure out the time of taking a prescription drug, based on information on the label" [SR16, Female, 2 weeks ago, Chemotherapy].

3. Communicative Literacy

This category involves four sub-categories: interpersonal communication, claiming and negotiation, involvement in decision-making, and information offering. This category refers to the service recipient's capability of interpersonal communication especially communicating with the health care provider. It also refers to people's capability to participate in the decision and make appropriate health decisions which is the prerequisite of patient-centered care. Further, this category deals with patients' ability to offer health history and ask about their rights.

3.1. Interpersonal Communication

This is referred to as health professionals-patient relations and the skill of clear communication with other patients, families, providers, and health systems. "Clear effective health communication is so important in health care setting. Patient safety and quality of health care is depended on the clear communication. One who is health literate in hospital setting, communicates properly with health care providers especially with doctors and nurses. Moreover, skill of clear communication is the foundation of patient self-care" [SP1].

3.2. Claiming and Negotiation

This is referred to as the skill of demanding rights. "Questioning is the key to gaining more information and right information is fundamental to informed decision. they should be able to ask about treatment methods, the benefits, risks and side effects of selective treatment. Service recipient who are health literate have the capability of asking question and demanding explanation. They have capability to saying when they don't understand and need to re-explain information. They also have capability of complaining and pursuing it" [SP21].

3.3. Involvement in Decision-making

This sub-category deals with people's capability to be involved in decision-making for their own care. Indeed, a prerequisite for making appropriate and informed decisions is gathering all the necessary information and understanding of conditions. "People should be actively participating in their treatment process. Some of them may undergo invasive procedures without fully understanding the procedure and potential risks and benefits. Patients and their family should understand their

options and they should be involved in decision-making and demand the care they really want" [SP8].

3.4. Information Offering

Service providers generally mentioned that patients should be able to describe their health history with accuracy; they also should explain experiences and symptoms, which are essential for diagnosis. "I think one who possesses hospital health literacy should be capable of offering all health history information and describing every condition on their health history. One who responds all doctors' questions correctly and does not miss important information which doctors needed to diagnose and treatment" [SP7].

4. Behavioral Literacy

This dimension refers to any obvious, informed, and purposeful action that people take toward their health in a hospital setting. It has the three sub-categories of navigation, hospital-related self-care, and hospital living.

4.1. Navigation

This sub-category is concerned with the capability of people to finding their way around the hospital. "People need to be capable to find their way in hospital environment by applying signs, directions, and instructions. They also should be able to traverse admission and discharge processes without any uncertainty and confusion" [SP13]. "In most cases people are confused in hospital because it is a complex, stressful and confusing organization. They should be able find their way for receive health services without any difficulty and delay. Indeed, they need be aware of the meaning of signs and directions" [SR15, Female, 1 week ago, Angiography].

4.2. Hospital-related Self-care

This is referred to one's ability to carry out treatment strategies and engagement in self-care in a hospital setting. People should take personal responsibility for their health in patient-centered care. "Patients should be able to monitor and report changes in their condition and also their drains and catheter, they should be capable enough to monitor their physiological status and warning symptoms. Indeed, they are an early warning system that could improve safety and prevented threaten satiation" [SP16].

4.3. Hospital Living

A few participants noted that patients need to be adapted to living in a hospital for a short time. "One who have the ability to coping with new environment and live temporary in new place. Even getting up, sitting or lying down is different in hospital. Patient should be capable of using call bell for help and they should get more assistance than usual to move around. They should be able to apply bed and other furniture correctly and safety. They also should to know hospital room, furniture, and bathroom location" [SP16].

5. Media Literacy

This category refers to searching, selection, and analysis of health information in a hospital setting. This

category involves two sub-categories: technological skill and information search and acquisition.

5.1. Technological Skill

This sub-category is concerned with using technology to acquire health information in hospital setting. In fact, people should be able to understand and use technology to access appropriate information, which improved the quality of care in a hospital setting. "One who has hospital health literacy is capable of using main types of communication technology like mobile phone and internet. The features and capabilities of modern mobiles phone are advanced and can facilitate large extended of services like receiving timely patient information results and QR codes to navigate in hospital" [SP9].

5.2. Information Search and Acquisition

Some service providers noted and mentioned that patients should be able to independently search for health information through hospital websites. "People should be capable of seeking information through health websites. Recently, the internet has had an increasingly significant growth and most hospitals have been created a website to offer their particular health information. A hospital website is a platform to provide updated information about patient services, treatments and technologies. People should be capable of searching and selecting appropriate and practical health information" [SP12].

6. Emotional Literacy

This category refers to having the capability to handle emotions to improve peoples' personal power and quality of life. It also refers to individual compatibility for adjustment in the social environment. This category involves two sub-categories: valuation of health and internalization of health value.

6.1. Valuation of Health

"Patients who have hospital health literacy should take care of their health and put place a premium on the treatment processes in the hospital. They also should patiently spend their time on long-term diagnostic and therapeutic processes in a complex hospital setting" [SP23].

6.2. Internalization of Health Value

"I think people who possess hospital health literacy should actively come to the hospital for screening and check-up. They should constantly try to improve their knowledge in appropriate of receiving high quality health services. In fact, seeking for best health service is of great value for them" [SP23].

Discussion

Our findings reveal similarities with different definitions of health literacy. Edwards *et al.*^[17] presented health knowledge as one of the dimensions of the health literacy conceptual framework and the first stage of the health literacy pathway model. This knowledge is included as a person's basic knowledge about health in general and knowledge about their own health

concerns, health services, and their rights as a patient. Cognitive literacy determined in this study was very similar to their finding, although we identified 11 sub-categories of cognitive literacy, which represented knowledge for HHL. Moreover, knowledge of disease basics was one of the main intermediate factors in the conceptual framework proposed by Lee *et al.*^[32] Similarly, knowledge was highlighted as the core of the concept of health literacy in some studies. For example, Schulz and Nakamoto represented declarative knowledge and procedural knowledge as a part of health literacy.^[33] Paakkari and Paakkari added theoretical knowledge and practical knowledge.^[34] Liu *et al.*^[20] extracted knowledge of health, health care, and health systems as one of the main themes in their study that divided it into four aspects, namely, knowledge of medicine, knowledge of health, knowledge of health systems, and knowledge of science. In other words, this classification is a summary of cognitive health literacy that was discussed in full detail in the hospital setting in the present study.

Functional literacy as a category is referred to sufficient basic skills in reading, writing, and calculating to be able to function effectively in different situations in a hospital setting. Functional literacy was one part of the first health literacy model proposed by Nutbeam.^[16] As supported in the literature, low health literacy puts patients at risk and increases difficulties taking medications, and interpreting medication labels and health information.^[35,36] Patients need to apply a basic level of reading, writing, and numeracy skills to health-related materials such as prescriptions and medicine labels.^[37]

Recently, patient-centered care is increasingly being suggested as a pathway to improving quality of care and better health outcomes. The prerequisite of patient-centered care is promoting patient-provider communication and engagement of patients in the decision-making process.^[38] Communicative literacy was another category extracted. Similarly, communicative literacy was the second part of the three-level model of Nutbeam and other conceptual frameworks. Edwards *et al.*^[17] emphasized the elements of communication with health professionals, active involvement in consultations, and making informed decision skills. Some studies have found that patients with low health literacy experienced lower quality and clarity of hospital communication.^[13,15] Moreover, some researches have mentioned that service recipients need sufficient time for face-to-face discussions with a physician. Communication during hospitalization affects their understanding of diagnoses, care plans, and their condition.^[39,40] Jessup *et al.*^[41] have mentioned high-quality communication, good discharge, and accessing qualified information as health literacy strategies that have the maximum patient and organizational benefits.

Bertakis and Azari pointed out that patients spontaneously offering information about health and disease, patients asking questions, and patients' self-reported physical health status are determinants of patient-centered care.^[42] Claiming and negotiation and information offering were extracted as a sub-category of communicative literacy.

Hospital-related self-care skill as a sub-category of behavioral literacy is also seen in other conceptual frameworks of health literacy. Edwards *et al.*^[17] reported that self-management skills include managing medication, self-monitoring, and managing a diet as a part of their framework. Self-care is considered a dynamic, intensely individual process of people learning ways to adapt to illness and to learn ways to deal with it.^[43] Urpí-Fernández *et al.*^[44] reported that self-care is manifested via behaviors such as personal hygiene, a healthy and nutritious diet, and activities intended at keeping a healthy balance. Thus, this could be considered a part of health literacy in a hospital setting. Navigation skill was extracted as the second sub-category of behavioral literacy. Freeman identified patient navigation as a patient-centered delivery model that overcomes barriers and guides patients to timely access to diagnosis and treatment in health care services.^[44] Paasche-Orlow and Wolf presented the patients' navigation skills as a dimension of a conceptual model of health literacy.^[45] Furthermore, many literature reviews suggest that patient navigation improves the timeliness of care and reduces disparities, particularly in cancer care.^[46]

Technological skills and information search and acquisition skills were extracted as the sub-categories of media literacy. Media literacy has been defined as "the ability to access, analyze, evaluate, and create media in a variety of forms" and was presented as one of the components of health literacy in different concepts.^[47] Namely, Levin-Zamir and Bertschi described the ability to identify health-related content and critically analyze the content as the components of health literacy in the context of media.^[48] Moreover, Manganello considered media literacy, the ability to critically evaluate media messages, as a construct of health literacy. Manganello also distinguished the ability of media use as an individual trait in his framework.^[49]

Emotional literacy that includes valuation of health and internalization of health value was a terminal dimension of health literacy in the present study. Although the term "emotional literacy" was defined by Nancu Graham in 1960, it was not considered a dimension in primary conceptual models of health literacy.^[50,51] Overlay, emotional literacy applies the components of emotional intelligence to recognize, understand, appropriately

express, and also manage emotions.^[52] Emotional literacy has been addressed tacitly and with various interpretations in the different concepts of health literacy. Edwards *et al.*^[17] presented personal motivations and managing emotions components which are influences on health literacy. While Ghaffari *et al.*^[53] considered attitudes and emotions as the independent dimensions of health literacy. The schematic model of the concept of HHL is presented in Figure 1.

Limitations and recommendation

This study is a first attempt to explain the concept of HHL. Probably, the findings of the present study will be useful in improving the quality of health care in hospitals. We had a range of service providers and service recipients with maximum diversity. The limitation of our study was the distrust of the interviewer by the service recipient. They imagined that if they offered negative information about the hospital, they would be denied of health services. For overcoming this limitation, the interviewer assured them their information would remain confidential and will not be transferred to service providers.

Conclusion

It seems that this study is the first attempt to explain the concept of HHL. Considering HHL in programs of health care organizations such as hospitals leads to improvement in quality and safety. Moreover, the findings of the present study provide a deep understanding of the concept of HHL that can be applied in the development of valid and reliable measurement tools for assessing HHL in a variety of populations. Also, they can be used to guide future research and interventions on HHL. It is hoped that these findings can provide a clear base for planning, implementing, and evaluating interventions aimed at promoting health literacy in health settings.

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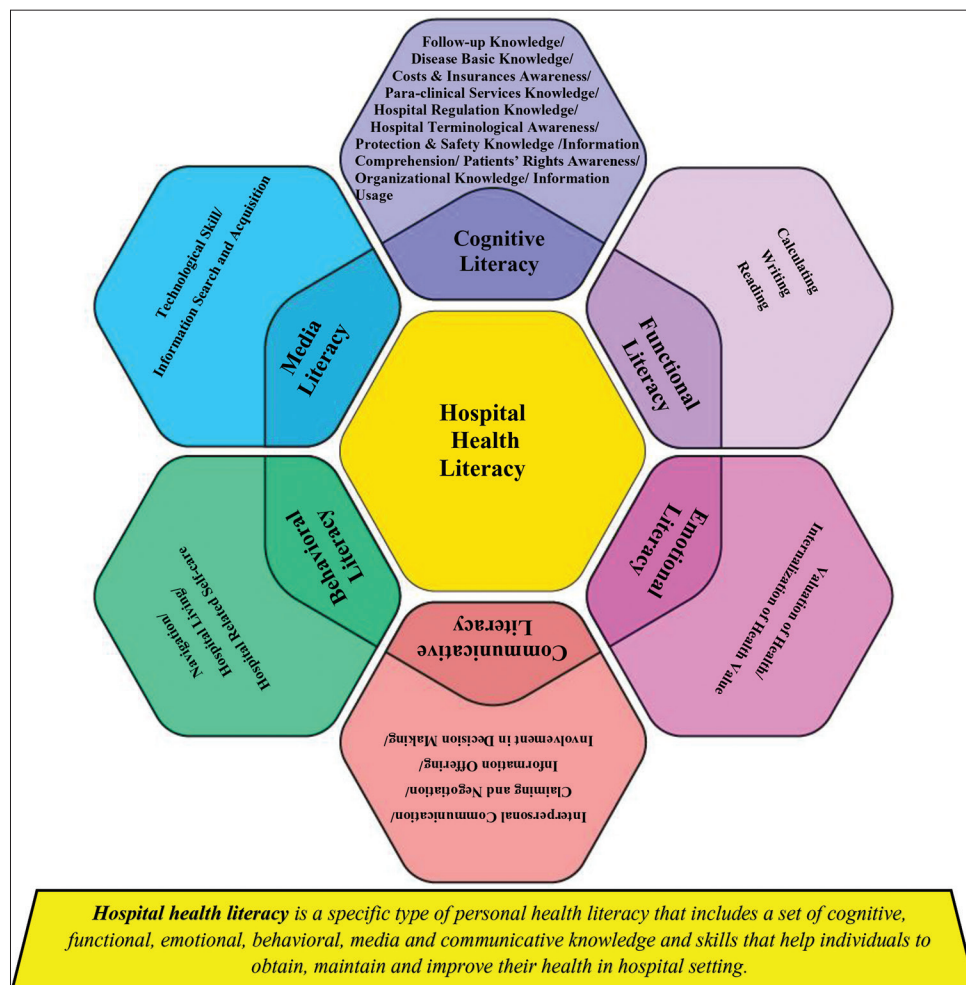


Figure 1: The schematic hexa-dimensional model for conceptual framework of hospital health literacy and proposed definition

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Conflicts of interest

The authors declare that they have no competing interests.

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