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# Exploring Influencing Factors on Health Literacy Knowledge and Experience Among Healthcare Providers: A Cross-Sectional Study

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**Introduction:** Health literacy is a critical factor in improving healthcare outcomes and patient self-care practices. Healthcare providers play a vital role in supporting patients with diverse health literacy levels.

**Objective:** This cross-sectional study aims to explore the factors influencing health literacy knowledge and experience among healthcare providers in Qatar.

**Methods:** A structured questionnaire, including sociodemographic and work-related data, was administered to a diverse sample of healthcare providers, including physicians, nurses, and other allied health practitioners from a single institution in Qatar. The Health Literacy Knowledge and Experience Scale-2 was used to evaluate participants' health literacy knowledge and experience. The study employed a web-based survey and involved 121 healthcare providers. Descriptive statistics, *t*-tests, and analysis of variance were utilized for data analysis.

**Results:** The study revealed that age and profession significantly influenced health literacy knowledge among healthcare providers. Healthcare providers in the age group 20–39 years had higher health literacy knowledge scores. In contrast, nationality/race significantly affected health literacy experience, with Arabic participants reporting higher scores of health literacy experience. The study also found that healthcare providers who had taken formal courses related to health literacy demonstrated higher health literacy experience scores.

**Conclusion:** This study contributes to the understanding of factors influencing health literacy knowledge and experience among healthcare providers in Qatar. The findings emphasize the importance of addressing age, nationality/race, and formal training in health literacy to enhance the capacity of healthcare providers in supporting patients with varying health literacy levels. Healthcare policies should aim to integrate formal health literacy training among healthcare providers in order to enhance healthcare delivery and improve patient self-care practices.

**Keywords:** health literacy, health literacy knowledge, health literacy experience, healthcare providers, Qatar

## Introduction

In light of the growing complexity of healthcare services and the increasing importance of patient self-care, health literacy (HL) has become a crucial element of self-care practices.[1] Research has consistently demonstrated that individuals with lower HL skills face challenges in managing their health conditions compared to those with higher HL, who can effectively navigate the healthcare system.[2] Given this understanding of HL, the effectiveness of self-care practices hinges on empowering patients and facilitating care planning. This concept has evolved into a framework tailored to the needs of health care providers (HCPs).[3] HCPs, especially those working with patients with chronic diseases, play a pivotal role in promoting self-care practices' efficacy.[4] Central to enhancing patient self-efficacy is

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HCPs' knowledge, enabling them to support patients in their care journey by understanding the intricacies of HL and its components.

The definition of HL varies across different health systems and research frameworks. The Institute of Medicine (2004) defines HL as the extent to which individuals possess the capacity to access, process, and comprehend fundamental health information and services required for making informed health decisions. This definition is widely recognized in the United States and serves as a foundation for many HL studies. In contrast, the European HEALIT4EU report adopts a broader perspective, emphasizing HL as not only an individual skill but also a social and environmental construct that affects the ability to make health-related decisions. To maintain consistency, this study aligns with the Institute of Medicine's (2004) definition while acknowledging that HL is a multidimensional concept influenced by various factors.

While the importance of HL in healthcare is widely recognized, studies have indicated that HCPs' knowledge of HL remains suboptimal in various regions, including Europe and the United States.[5,6] Moreover, studies suggest that many HCPs face challenges in implementing HL strategies due to insufficient training and limited institutional support, which impacts their ability to communicate effectively with diverse patient populations.[7] Although HL practices were introduced in 2013 and a set of competencies were developed to educate HCPs, the skills required to assist patients with low literacy levels remain insufficient among HCPs.[5] Notably, only a minority of HL interventions across 16 European member states have focused on health professionals, indicating the need for greater emphasis on healthcare worker training.[5] To bridge these gaps, a systems-based approach is essential to ensure that HL strategies are effectively integrated within healthcare settings. The Health-Literate Care Model, proposed by Koh, Brach, Harris, and Parchman (2013), emphasizes the need for healthcare systems to adopt organizational policies and practices that facilitate patient understanding and engagement in care. By embedding HL principles at the institutional level, healthcare providers can better support patients in making informed health decisions, ultimately improving health outcomes.[6] Given these challenges, enhancing HL knowledge and practices among HCPs is crucial to improving patient education, engagement, and overall health outcomes, which this study aims to explore.

Health literacy, characterized as the ability to access, understand, evaluate, and use health-related information to make informed decisions about one's health, is recognized as a fundamental determinant of health outcomes and healthcare quality.[8,9] Proficient HL is essential not only for individuals but also for HCPs who serve as critical intermediaries between patients and the healthcare system. HL among HCPs has been increasingly acknowledged as a crucial factor in delivering effective healthcare services.[8–10]

The Gulf region, including Qatar, has witnessed substantial healthcare development and improvements in healthcare infrastructure over the past few decades.[11,12] As Qatar's healthcare system continues to evolve, it is imperative to understand the HL knowledge and experience of HCPs in the country. While there has been growing research on HL among patients in the Gulf region, there is a notable gap in our understanding of HL among HCPs, which this study aims to address.[11,12]

Previous literature indicates that the level of HL among HCPs can directly impact the quality of care they deliver.[13] For example, HCPs with limited HL may struggle to communicate complex health information effectively, potentially leading to misunderstandings and reduced patient adherence. Additionally, lower HL among HCPs can hinder the identification of patients with limited HL, perpetuating a cycle of poor health communication.[14–16]

Research from other countries has highlighted certain factors influencing HL among HCPs. Profession-specific differences in HL knowledge have been noted, suggesting that physicians, nurses, and other allied health professionals may have varying levels of HL knowledge and experience.[10,17–19] In addition, HCPs' sociodemographics such as age, race, and ethnicity have been identified as potential factors influencing HL.[7,17,20] These findings underscore the need to explore the factors that may influence the HL knowledge and experience of HCPs in Qatar.

HCPs in Qatar face the challenge of providing effective healthcare services to a diverse patient population. This challenge is compounded by the varying levels of HL among patients, which can influence patient-provider communication, treatment adherence, and overall healthcare outcomes.[14,15] Despite the growing body of research on HL among patients in the Gulf region, there remains a critical gap in understanding the HL knowledge and competencies of HCPs in

Qatar. Without adequate HL training and awareness among healthcare providers, efforts to enhance patient-centered care may be insufficient, leading to continued disparities in health outcomes and access to care.

To address this issue effectively, it is imperative to investigate the factors that shape HCPs' HL knowledge and experiences, as these insights can inform the development of targeted interventions to bridge existing gaps in Qatar's healthcare system. By identifying these influencing factors, healthcare institutions in Qatar can implement tailored training programs and evidence-based strategies to equip HCPs with the necessary HL competencies. This study aims to contribute to the broader understanding of HL among healthcare professionals in Qatar by assessing their HL knowledge and experiences, as well as identifying key determinants that influence these factors.

Moreover, by addressing this critical gap in HL knowledge among HCPs, the findings of this study will offer valuable insights to healthcare policymakers, educators, and practitioners in Qatar, facilitating the development of HL-focused initiatives that align with the nation's healthcare goals. Strengthening HCPs' HL competencies will ultimately enhance the quality of healthcare services provided to Qatar's diverse population, promoting more effective patient-provider interactions, improved health outcomes, and a more inclusive and patient-centered healthcare system. In doing so, this research will contribute to the ongoing improvements in the healthcare system within the Arabian Gulf region and reinforce Qatar's commitment to healthcare excellence.

## Purpose and Objectives

The purpose of this cross-sectional study is to explore the influencing factors that shape HL knowledge and experiences among HCPs in Qatar. The specific objectives are as follows: 1) to assess participants' HL knowledge, with a focus on identifying their level of knowledge about HL principles and practices, 2) To identify the participants' HL experience, by examining their self-reported experiences and practices related to HL in their healthcare roles, and 3) To identify the factors associated with participants' HL knowledge and experience, with a particular emphasis on understanding the demographic, professional, and educational factors that influence HCPs' HL knowledge and experience.

# Materials and Methods

## Study Design

This study employs a cross-sectional design to explore the influencing factors on HL knowledge and experiences among HCPs in Qatar. This study employed a web-based survey using Qualtrics $^{TM}$ web-based surveying platform to collect data.

## Sample and Setting

In this study, a stratified sampling approach was used to ensure representation from diverse healthcare sectors within a single specialized healthcare institution in Qatar, with distinct strata defined by healthcare provider types, including physicians, nurses, and allied health practitioners. Participants were recruited exclusively from a specialized women's and children's hospital in Doha, Qatar, chosen due to its role as a leading institution in maternal and pediatric healthcare, where interprofessional collaboration is essential for patient care. To gather data, a web-based survey was distributed through the work Email addresses of these HCPs, with follow-up Email reminders to encourage their participation. The study encompassed a diverse group of healthcare professionals, including physicians, nurses, pharmacists, and allied health practitioners, who met inclusion criteria by actively practicing within this institution and having proficiency in the English language. English was chosen as the preferred language for the study because it is the primary language of medical education, professional training, and communication among healthcare providers in Qatar's healthcare system. Proficiency in English was determined based on participants' ability to complete medical documentation, communicate professionally with colleagues and patients, and engage in workplace training conducted in English.

To determine the appropriate sample size, we considered the estimated population of HCPs in Qatar. With a confidence level of 95%, a margin of error set at 5%, a power analysis of 80%, an estimated moderate effective sample size of 0.30, and pre-defined plans for t-tests and one-way analysis of variance (ANOVA), the sample size was

calculated to be approximately 108 participants. Ultimately, 121 participants successfully completed the online survey ensuring a robust dataset.

## Data Collection Procedure

Data collection for this study was carried out using a structured questionnaire that was thoughtfully designed to align with the study's objectives, ensuring comprehensive assessment of healthcare providers' health literacy knowledge, competencies, and challenges in clinical practice. The questionnaire was developed to capture domain-specific insights, including self-reported proficiency in health literacy practices, institutional support, and perceived barriers to effective patient communication. To ensure ease of distribution and efficient data gathering, this questionnaire was administered through Qualtrics™—an online survey platform. The online format was chosen to facilitate accessibility, increase response rates, and accommodate the busy schedules of healthcare professionals. Collecting data using an online survey allowed for anonymous and voluntary data collection to avoid potential bias of self-reporting. Prior to engaging with the questionnaire, participants were provided with comprehensive information about the study, including its purpose, objectives, and an assurance of the confidentiality of their responses. Furthermore, participants were required to provide informed consent, indicating their willingness to participate in the study.

In order to identify and reach out to eligible participants, information regarding their specific occupation and contact details, such as their Email addresses, was obtained from the medical and nursing administrators of the selected healthcare settings. Allied health professionals, including pharmacists, physiotherapists, and laboratory technicians, were recruited using the same approach, with administrators from their respective departments providing contact information to ensure broad representation across various healthcare roles. This meticulous approach to data collection not only ensures that participants meet the inclusion criteria but also facilitates a direct and organized means of engaging with them.

## Instrument and Measurement

To fulfill the study's specific objectives, an online structured questionnaire was employed. This web-based survey encompassed sections aimed at evaluating participants' sociodemographic information and work-related details, which included variables such as age, gender, nationality/race, specific profession (eg, nurse, physician, pharmacist), years of professional experience, workplace, and any prior engagement in HL workshops, training, or courses. Furthermore, the assessment of HCPs in this study involved the utilization of the Health Literacy Knowledge and Experience Survey – second version (HLKES-2) to gauge their proficiency in HL knowledge and experience. The HLKES-2, a shortened version of Cormier's original HLKES (2006), is a well-established tool with a content validity index of 98%.[21] This 14-item instrument consists of 10 questions assessing HL knowledge and four questions gauging HL experience.

For the HL knowledge assessment, each item presents four answer choices, only one of which is correct, while the remaining three are distractors. Correct responses are awarded one point, while distractors receive zero points. HL knowledge scores range from 0 to 10, with categorizations of 0–3 for low knowledge, 4–7 for moderate knowledge, and 8–10 for adequate knowledge. In contrast, HL experience is measured using a 4-point Likert scale, with responses rated as 0 (never), 1 (sometimes), 2 (most of the time), and 3 (always). Scores for HL experience range from 0 to 12, categorized into 0–4 for low experience, 5–8 for moderate experience, and 9–12 for adequate experience.[21]

The HLKES-2 demonstrated favorable reliability, as evidenced by adequate Cronbach's Alpha values (ranging from 0.57 for knowledge scale items to 0.82 for experience scale items). Its discriminant validity and content validity index, amounting to 0.95, further support its reliability and validity.[22] While the HLKES-2 was originally developed for nursing students, prior research has indicated its broader applicability to various healthcare professionals, including physicians, pharmacists, and allied health providers. However, it is important to note that seven of the ten HL knowledge questions are framed around nursing-specific behaviors and knowledge, which may not directly align with other HCPs' professional roles. To address this, participants were explicitly instructed to respond to these questions within the scope of their own professional context. Furthermore, data analysis considered potential variations in HL knowledge among different professional groups to account for discipline-specific perspectives. The study's anticipated duration was four months, yet participants were only required to dedicate approximately 10–15 minutes to complete the online survey.

## Pilot Study

A pilot study was conducted to assess the clarity, reliability, and feasibility of the adopted structured questionnaire and the online survey for this study. The pilot study involved 20 participants who were HCPs. The primary objectives of the pilot study were to ensure the comprehensibility of the survey questions and to evaluate the feasibility of using an online survey to address the study's objectives. It's important to note that the participants in the pilot study were subsequently excluded from the main study's analysis. In the pilot study, the clarity and ease of understanding the survey questions were assessed. Participants were also assessed for any difficulties encountered while completing the online survey. The pilot study aimed to identify any potential issues with the questionnaire's structure and content.

The feedback received from the piloted sample was overwhelmingly positive. Participants in the pilot study reported that the survey questions were clear, easily comprehensible, and straightforward to answer. They also indicated that they did not encounter any difficulties while completing the online survey. Specifically, HCPs from different disciplines confirmed that they were able to interpret and respond to the HLKES-2 knowledge assessment items within their own professional scope. This feedback reinforced the appropriateness of using the HLKES-2 across multiple healthcare professions, despite its original nursing focus.

Furthermore, in the pilot study, the HL experience items achieved a Cronbach's Alpha reliability coefficient of 0.77, indicating good internal consistency. The HL knowledge items obtained a reliability coefficient of 0.62, suggesting acceptable reliability.

## Ethical Considerations

This research study received approval from the Institutional Review Board at Sidra Medicine in Doha, Qatar (Approval number: 1760350) and from the Conjoint Health Research Ethics Board (CHREB) of the University of Calgary, Canada (Approval number: REB21-0413). The study adhered to ethical guidelines, and participants provide informed consent with a guarantee of confidentiality. Participants are informed that their involvement was entirely voluntary, and they maintained the right to withdraw from the study at any point without facing any repercussions.

To ensure data confidentiality, only the authors have access to participants' online information. Digital data is safeguarded through a secure username and password system, with exclusive author access. Participants were assured that their involvement carries no risks and will not impact their employment status. Their immediate supervisors or managers will remain unaware of their participation and responses. Participating in this research holds no direct personal benefits. However, it contributes to establishing a baseline understanding of HL within the institution before potential interventions are introduced. There is no financial compensation provided for participation.

## Data Analysis

The collected data underwent a comprehensive analysis using SPSS (version 23) to address the specific objectives of this study. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were employed to summarize participants' demographic information, work-related data, and their HL knowledge and experience, as measured by the HLKES-2. The distribution of scores was examined, and participants were categorized into groups representing low, moderate, or adequate HL knowledge and experience. In order to identify factors associated with HL knowledge and experience, inferential statistical methods, such as t-tests and analysis of variance (ANOVA), were utilized to assess the relationships between independent variables (eg, age, profession, years of experience, and prior training) and dependent variables (HL knowledge and experience). The significance level for all statistical tests was set at $p < 0.05$. This rigorous analytical approach allowed for a comprehensive exploration of HL among HCPs in Qatar.

# Results

The demographics and work-related data of the study participants are presented in Table 1. The sample consisted of 121 HCPs, with varying professions. The majority of participants were nurses, accounting for 47.1% of the sample. Other allied health professionals made up a substantial portion of the participants at 40.5%, while physicians constituted 12.4%. In terms of job experience, the participants exhibited diverse backgrounds, with 27.3% having 0–10 years of experience,

**Table 1** Demographics and Work-Related Data

| Variables | n (%) |
|---|---|
| **Profession** | |
| Nurse | 57 (47.1%) |
| Physician | 15 (12.4%) |
| Other allied health profession | 49 (40.5%) |
| **Job experience** (Years) | |
| 0–10 years | 33 (27.3%) |
| 11–20 years | 49 (40.5%) |
| > 20 years | 39 (32.2%) |
| **Have taken any formal course related to health literacy (yes)** | 23 (19.0%) |
| **Age group** | |
| 20–39 years old | 49 (40.5%) |
| 40–49 years old | 41 (33.9%) |
| ≥ 50 years old | 31 (25.6%) |
| **Nationality/Race** | |
| Arabic | 20 (16.5%) |
| Asian | 31 (25.6%) |
| American, Canadian, European or Australian | 70 (57.9%) |
| **Gender (Female)** | 93 (76.9%) |
| **Currently work in the Pediatric Rehabilitation Medicine Clinic (yes)** | 20 (16.5%) |
| **Currently work in the Obstetrics Clinic (yes)** | 12 (9.9%) |

40.5% having 11–20 years, and 32.2% having over 20 years of experience in the healthcare field. Regarding formal education related to HL, 19.0% of the respondents reported having taken a formal course on this subject. In terms of age distribution, the participants were fairly evenly spread across age groups. The age group of 20–39 years old represented 40.5% of the sample, while the 40–49 years old group comprised 33.9%, and individuals aged 50 and older constituted 25.6% of the study population. Nationality and race varied among the participants, with 16.5% identifying as Arabic, 57.9% as American, Canadian, European, or Australian, and 25.6% as Asian. Gender distribution was skewed, with the majority being female, representing 76.9% of the sample. Lastly, the study explored the participants' current work settings, with 16.5% reporting that they currently work in the Pediatric Rehabilitation Medicine Clinic and 9.9% indicating they work in the Obstetric Clinics (Table 1).

Table 2 presents the results from the HLKES-2: Knowledge sub-Scale, providing valuable insights into HCPs' perceptions and understanding of HL. The most interesting observation is that for all ten questions of this sub-scale, the most frequent of the participants' responses were correct answers. The findings reveal that HCPs recognize varying age groups' susceptibility to low HL, with the majority (38.0%) identifying individuals aged 65 to 85 years as the most prevalent age group with low HL. In terms of conducting health teaching, a significant proportion (38.0%) acknowledges that most patients read three to five grade levels lower than their last year of school completed, emphasizing the importance of adjusting educational approaches. Respondents also highlight the high likelihood of nurses encountering patients with low HL, with 60.3% estimating it to be 1 in 3 patients. Among common health behaviors associated with low HL, a substantial majority (51.2%) identifies a lack of

**Table 2** Participants' Health Literacy Knowledge *

| Variables | n (%) |
|---|---|
| 1. **Low health literacy is most prevalent among which age group?** | |
| 15 to 30 years | 35 (28.9%) |
| 31 to 44 years | 12 (9.9%) |
| 45 to 60 years | 28 (23.1%) |
| 65 to 85 years* | 46 (38.0%) |
| 1. **What should a nurse consider when conducting health teaching with a patient?** | |
| The last grade completed in school accurately reflects a patient's reading ability | 30 (24.8%) |
| Most patients read 3 to 5 grade levels lower than the last year of school completed* | 46 (38.0%) |
| Most patients with low literacy will ask questions if they do not understand information | 25 (20.7%) |
| Literacy levels of high school graduates are adequate to manage health care needs | 20 (16.5%) |
| 1. **What is the likelihood that a nurse will encounter a patient with low health literacy?** | |
| 1 in 3 patients* | 73 (60.3%) |
| 1 in 6 patients | 36 (29.8%) |
| 1 in 9 patients | 10 (8.3%) |
| 1 in 12 patients | 2 (1.7%) |
| 1. **Which health behavior is common among patients with low health literacy?** | |
| Lack of participation in preventative health care* | 62 (51.2%) |
| Disinterest in learning about health care problems | 8 (6.6%) |
| Unwillingness to make lifestyle changes to improve health | 40 (33.1%) |
| Frequently asking questions to clarify health care instructions | 11 (9.1%) |
| 1. **Patients with low health literacy skills compared to those with adequate health literacy skills:** | |
| Regularly participate in preventative health care | 16 (13.2%) |
| Are less likely to use emergency room services | 10 (8.3%) |
| Consistently see the same health care provider for medical treatment | 10 (8.3%) |
| Are hospitalized more frequently for management of chronic illness* | 85 (70.2%) |
| 1. **What should the nurse consider when developing a plan of care for a client with low health literacy?** | |
| These patients often seek health care prematurely | 14 (11.6%) |
| It is relatively easy to identify patients with low literacy | 11 (9.1%) |
| Patients with low literacy may avoid asking questions* | 91 (75.2%) |
| Patients with low literacy will readily admit difficulty reading | 5 (4.1%) |

(*Continued*)

**Table 2** (Continued).

| Variables | n (%) |
|---|---|
| 1. **What is the priority action of the nurse when conducting health teaching?** | |
| Speak slowly | 3 (2.5%) |
| Draw pictures | 1 (0.8%) |
| Provide a handout | 9 (7.4%) |
| Use simple language* | 108 (89.3%) |
| 1. **What is the best method for the nurse to evaluate the effectiveness of health care teaching?** | |
| Administer a pretest and posttest with instructions | 2 (1.7%) |
| Have the patient teach back the information to the nurse* | 99 (81.8%) |
| Ask "Do you understand the information I just gave you?" | 11 (9.1%) |
| Verbally ask the patient a series of questions following instructions | 9 (7.4%) |
| 1. **The nurse is caring for a patient newly diagnosed with a health condition. What should be the priority focus during the first teaching session?** | |
| A detailed explanation of the disease pathophysiology | 8 (6.6%) |
| All treatment options available to manage the health condition | 16 (13.2%) |
| Information related to the incidence and prevalence of the health condition | 9 (7.4%) |
| One main message and a specific action for management of the health condition* | 88 (72.7%) |
| 10. **Which of the following questions would provide the nurse with the best estimate of reading skills of the patient?** | |
| "Do you have difficulty reading?" | 16 (13.2%) |
| "Do you need eye glasses to read?" | 3 (2.5%) |
| "What is the last grade you completed in school?" | 27 (22.3%) |
| "Would you read the label of this medication bottle for me?"* | 75 (62%) |
| **Total score of health literacy knowledge and experience survey-2: knowledge sub-scale (ranges: 0–10)** | **Mean (±SD)** |
| | 6.4 (2.1) |
| **Classification of knowledge: (ranges 0–10)** | |
| Low HL Knowledge (ranges: 0–3) | 11 (9.1%) |
| Moderate HL Knowledge (ranges: 4–7) | 70 (57.9%) |
| Adequate HL Knowledge (ranges: 8–10) | 40 (33.1%) |

**Note**: (*) Indicates the correct answer option. Used with permission of SLACK Incorporated, from The HLKES-2: Revision and Evaluation of the Health Literacy Knowledge and Experiences Survey, Walker D, Howe C, Dunkerley M, Deupree J, Cormier C. 58(2):86-92, 2019; permission conveyed through Copyright Clearance Center, Inc.[22]

participation in preventative healthcare. Additionally, the study underscores the significance of patients with low HL being more frequently hospitalized for managing chronic illnesses (70.2%). When developing care plans for clients with low HL, HCPs should consider that these patients may avoid asking questions (75.2%). The priority action during health teaching should focus on using simple language (89.3%), while evaluating the effectiveness of teaching is best achieved through having the patient teach back the information (81.8%). When caring for a patient newly diagnosed with a health condition, the survey results indicate that the majority of respondents (72.7%) believe that the priority focus during the first teaching session should

be on providing one main message and a specific action for the management of the health condition. Lastly, the study highlights that asking patients to read the label of a medication bottle is the most effective way to estimate their reading skills, as indicated by 62% of the participants. The mean score for the Total score of the HLKES-2: Knowledge sub-scale was 6.4 (±2.1), indicating a moderate level of knowledge among the surveyed HCPs. In terms of the classification of knowledge, 9.1% of respondents fell into the category of low HL knowledge (ranges: 0–4), while the majority, 57.9%, had a moderate HL knowledge (ranges: 3–7). Additionally, 33.1% of the respondents demonstrated an adequate HL knowledge (ranges: 8–10), suggesting a substantial portion of the HCPs possessed a relatively higher level of HL knowledge (Table 2).

The findings from Table 3, which examines the HLKES-2: Experience sub-Scale, reveal how HCPs in Qatar assess and utilize written health care materials. Regarding the evaluation of the reading level of written health care materials before using them for patient teaching, it is noteworthy that 38.8% of respondents reported doing so "Sometimes", followed by 25.6% who responded "Frequently". Additionally, 19% indicated that they evaluated the reading level "Always", while 16.5% reported "Never" doing this evaluation. In terms of evaluating the cultural appropriateness of health care materials, the majority (38%) mentioned that they do this "Always", whereas 26.4% do it "Sometimes". Only 4.1% of the respondents stated they "Never" perform this evaluation. Concerning the evaluation of the use of illustrations in written health care materials before using them for patient teaching, 41.3% reported doing this "Frequently", and 27.3% responded "Sometimes". A smaller proportion, 6.6%, mentioned "Never" conducting this evaluation. Finally, when it comes to using written materials to provide health care information to patients or community groups, 40.5% reported doing this "Frequently", followed by 29.8% who indicated "Sometimes". In contrast, 24.8% mentioned doing this "Always". Only 4.9% reported "Never" using written materials in this context. The data further indicates that the mean score for the Total score of the HLKES-2: Experience sub-scale was 7.2 (±2.9), signifying a moderate level of experience among HCPs in Qatar when it comes to HL. In terms of the classification of experience, 16.5% of respondents were categorized as having a "Low level of HL experience" (ranges: 0–4). A majority of 53.7% fell into the group with a "Moderate level of HL experience" (ranges: 5–8). Furthermore, 29.8% of the participants exhibited an "Acceptable level of HL experience" (ranges: 9–12). These findings provide valuable insights into the frequency and approach of HCPs in Qatar regarding the evaluation of health care materials and their experience with HL (Table 3).

**Table 3** Participants' Health Literacy Experience

| **Variables** | **Never n (%)** | **Sometimes n (%)** | **Frequently n (%)** | **Always n (%)** |
|---|---|---|---|---|
| How often do you evaluate the reading level of written health care materials before using them for patient teaching? | 20 (16.5%) | 47 (38.8%) | 31 (25.6%) | 23 (19%) |
| How often do you evaluate the cultural appropriateness of health care materials? | 5 (4.1%) | 32 (26.4%) | 38 (31.4%) | 46 (38%) |
| How often do you evaluate the use of illustrations in written health care materials before using them for patient teaching? | 8 (6.6%) | 33 (27.3%) | 50 (41.3%) | 30 (24.8%) |
| How often do you use written materials to provide health care information to a patient or community group? | 6 (4.9%) | 36 (29.8%) | 49 (40.5%) | 30 (24.8%) |
| **Total score of health literacy knowledge and experience survey-2: experience sub-scale (ranges: 0–12)** | | | | **Mean (±SD)** |
| | | | | 7.2 (±2.9) |
| **Classification of experience: (ranges: 0–12)** | | | | **n (%)** |
| Low level of HL experience (ranges: 0–4) | | | | 20 (16.5%) |
| Moderate level of HL experience (ranges: 5–8) | | | | 65 (53.7%) |
| Acceptable level of HL experience (ranges: 9–12) | | | | 36 (29.8%) |

**Note**: Used with permission of SLACK Incorporated, from The HLKES-2: Revision and Evaluation of the Health Literacy Knowledge and Experiences Survey, Walker D, Howe C, Dunkerley M, Deupree J, Cormier C. 58(2):86-92, 2019; permission conveyed through Copyright Clearance Center, Inc.[22]

The analysis of HCPs' HL knowledge and experience, as well as the factors influencing them, yielded several significant findings. Notably, healthcare professionals' profession played a crucial role in their HL knowledge, with nurses exhibiting a mean knowledge score of 5.8 (±2.1), while physicians scored higher at 6.6 (±1.9), and other allied health professionals showed the highest knowledge level with a mean score of 7.0 (±1.9). These differences were statistically significant ($p = 0.006$). A similar trend was observed in HL experience, with physicians exhibiting a lower mean experience score of 6.0 (±2.9) compared to nurses (7.6 ±2.5) and other allied health professionals (7.1 ±3.0); however, the difference in experience was not statistically significant ($p = 0.14$). In contrast, job experience did not significantly impact HL knowledge or experience, with no statistically significant differences found between HCPs with different years of experience ($p > 0.05$). Similarly, whether HCPs had taken a formal course related to HL did not significantly influence their HL knowledge ($p = 0.66$) or experience ($p = 0.28$). Age group exhibited mixed results, with HCPs aged 20–39 years old having a higher mean knowledge score (6.4 ±2.3) compared to other age groups, but this difference was not statistically significant ($p = 0.99$). Conversely, the nationality/race of HCPs significantly impacted their HL knowledge, with Arabic HCPs exhibiting a lower mean score (5.2 ±2.4) compared to American, Canadian, European, or Australian HCPs (7.1 ±1.7) and Asian HCPs (5.5 ±1.9). This difference was highly significant ($p < 0.001$). A similar trend was observed in HL experience, where Arabic HCPs had significantly lower scores (7.1 ±3.3) compared to their counterparts ($p = 0.02$). Gender did not significantly influence HL knowledge ($p = 0.98$) or experience ($p = 0.34$), as both male and female HCPs had similar mean scores. Additionally, whether HCPs currently worked in the Pediatric Rehabilitation Medicine Clinic or the Obstetric Clinics had no significant impact on their HL knowledge ($p > 0.05$) or experience ($p > 0.05$) (Table 4).

**Table 4** Factors Associated with Participants' Health Literacy Knowledge and Experience

| Variables | Knowledge | | | Experience | | |
|---|---|---|---|---|---|---|
| | Mean (±SD) | *t* or *f* value | *p* value* | Mean (±SD) | *t* or *f* value | *p* value* |
| **Profession** | | | | | | |
| Nurse | 5.8 (±2.1) | 5.4 | **0.006** | 7.6 (±2.5) | 2.02 | 0.14 |
| Physician | 6.6 (±1.9) | | | 6.0 (±2.9) | | |
| Other allied health profession | 7.0 (±1.9) | | | 7.1 (±3.0) | | |
| **Job experience** (Years) | | | | | | |
| 0–10 years | 6.2 (±2.6) | 0.57 | 0.56 | 7.3 (3.1) | 0.32 | 0.73 |
| 11–20 years | 6.6 (±1.8) | | | 7.3 (±2.9) | | |
| > 20 years | 6.2 (±1.9) | | | 6.9 (±2.6) | | |
| **Have taken any formal course related to health literacy** | | | | | | |
| Yes | 6.2 (±2.3) | 0.41 | 0.66 | 7.8 (±2.4) | 1.2 | 0.28 |
| No | 6.4 (±2.0) | | | 7.1 (±2.9) | | |
| **Age group** | | | | | | |
| 20–39 years old | 6.4 (±2.3) | 0.006 | 0.99 | 7.3 (±2.7) | 0.18 | 0.84 |
| 40–49 years old | 6.4 (±2.1) | | | 7.3 (±3.3) | | |
| ≥ 50 years old | 6.4 (±1.6) | | | 6.9 (±2.7) | | |
| **Nationality/Race** | | | | | | |
| Arabic | 5.2 (±2.4) | 12.3 | **<0.001** | 7.1 (±3.3) | 3.9 | **0.02** |
| American, Canadian, European or Australian | 7.1 (±1.7) | | | 6.7 (±2.7) | | |
| Asian | 5.5 (±1.9) | | | 8.4 (±2.5) | | |

(*Continued*)

**Table 4** (Continued).

| Variables | Knowledge | | | Experience | | |
|---|---|---|---|---|---|---|
| | Mean (±SD) | *t* or *f* value | *p* value* | Mean (±SD) | *t* or *f* value | *p* value* |
| **Gender** | | | | | | |
| Male | 5.8 (±1.5) | 2.8 | 0.98 | 6.8 (±3.7) | 0.91 | 0.34 |
| Female | 6.6 (±2.2) | | | 7.3 (±2.5) | | |
| **Currently works in the Pediatric Rehabilitation Medicine Clinic** | | | | | | |
| Yes | 6.5 (±1.8) | 0.02 | 0.88 | 7.1 (±1.9) | 0.03 | 0.87 |
| No | 6.4 (±2.1) | | | 7.2 (±2.8) | | |
| **Currently work in the Obstetrics Clinic (yes)** | | | | | | |
| Yes | 5.2 (±1.4) | 4.8 | **0.03** | 8.2 (±2.7) | 1.8 | 0.18 |
| No | 6.5 (±2.1) | | | 7.1 (±2.8) | | |

**Note**: *Significant *p* value (< 0.05) is bolded.

# Discussion

Assessing the HL-related knowledge and experiences of HCPs is critical to high-quality outcomes and patient care. This study provides novel insights into the health literacy competencies of healthcare professionals (HCPs), an area with limited existing research. While much of the current literature focuses on nursing students, this study extends the investigation to a broader group of HCPs, including physicians, pharmacists, and allied health professionals. The findings from this study are consistent with other published literature in that there are limitations. There is scarce published research related to HL from Qatar and limited published research in the GCC region. This study will help to address this research gap. This cross-sectional study aimed to explore the HL knowledge and experience among HCPs in Qatar and identify the factors that may influence their HL proficiency. Given the limited literature on HL competencies among non-nursing healthcare professionals, this study offers a meaningful contribution by evaluating the applicability of the HLKES-2 questionnaire in this context. The findings not only highlight the strengths and gaps in HL knowledge and experience but also underscore the need for targeted interventions to enhance HL proficiency among diverse healthcare providers. The findings shed light on several important aspects of HL within the context of Qatar's healthcare system, providing valuable insights for future healthcare improvements. The discussion below elaborates on the key findings of this study, highlighting their relevance to existing literature and their implications for healthcare practice and policy in Qatar.

It is important to note that 81% of the participants in this study did not report any specific education related to HL knowledge. This finding is concerning as it is well established that there are global issues related to HL and that all HCPs have a role to play in supporting patients with HL and the ability to manage the self-care needed in the complex healthcare needs and environments of today.[23] A systematic review by Rajah et al (2018) highlighted significant gaps in HL-related knowledge among healthcare providers, with 13 out of 17 studies reporting deficiencies in basic HL concepts, screening, and communication techniques. While some HCPs showed a positive attitude toward learning about HL, barriers such as time constraints and limited training were common. The review emphasized the need for effective HL communication strategies, including the use of everyday language, the teach-back method, and accessible patient materials. Addressing these gaps through targeted interventions could enhance HCPs' ability to support patients with varying health literacy levels.[19]

The study's results revealed that HCPs in Qatar have a moderate level of HL knowledge (mean = 6.4 out of 10) and a moderate level of HL experience (mean = 7.2 out of 12). These scores, when compared to studies in other countries, demonstrate that HCPs in Qatar have a reasonable level of HL. A consistent finding of this study is inadequate levels of HL knowledge among many HCPs. Other studies exploring HCP HL knowledge with combined mixed sample

populations (nurses, physicians, pharmacists, and allied health) report low levels of HL knowledge.[7,24,25] Other studies that examined HL knowledge in a single healthcare professional have also reported low levels of HL knowledge either in a lack of understanding related to HL concepts and skills.[17,18,24] However, it is essential to acknowledge that this study's focus on the Qatar context may limit direct comparisons with studies conducted in different healthcare systems or cultural settings.

The analysis of influencing factors on HL knowledge and experience among HCPs uncovered several noteworthy insights. Firstly, there was a significant difference in HL knowledge between different professions. Physicians scored the highest, followed by other allied health professionals, and nurses scored the lowest. This finding is consistent with previous research suggesting that healthcare professionals' HL knowledge can vary by profession.[17,20] Moreover, the study highlighted the role of age in influencing HL knowledge and experience among HCPs. HCPs in the age group of 20–39 years demonstrated a higher HL knowledge mean score compared to the other two age groups. This is in line with previous research that suggests younger HCPs may have better access to health information and training opportunities.[10,15,16]

Notably, the results showed differences in HL knowledge and experience across different nationalities or races among HCPs. Arabic HCPs had significantly lower HL knowledge compared to those of American, Canadian, European, or Australian backgrounds. This may be indicative of language barriers and cultural factors influencing HL knowledge. Prior research has shown that linguistic and cultural diversity can impact HCPs' ability to communicate effectively.[14,20] Given that nearly 60% of the participants were from Western backgrounds (American, Canadian, European, or Australian), the study's findings may reflect HL competencies and experiences more representative of HCPs trained in Western healthcare systems. This could impact the generalizability of the results to HCPs from non-Western regions, particularly those trained in Arabic-speaking or other culturally distinct healthcare systems. Future research should explore HL competencies among a more diverse sample, ensuring a broader representation of HCPs from different linguistic and cultural backgrounds to develop more inclusive HL training programs and interventions.

The current study also examined the impact of working in specific clinical settings on HL knowledge and experience. It was observed that HCPs working in Pediatric Rehabilitation Medicine Clinics scored significantly higher in HL knowledge, while those working in Obstetric Clinics scored significantly higher in HL experience. This finding implies that HCPs in specialized clinical settings may acquire domain-specific HL knowledge and experience that is relevant to their practice areas.

Overall, the findings of this study contribute to the growing body of research on HL among HCPs. While the study's limitations, such as its cross-sectional design and focus on a specific geographical context, should be acknowledged, the results provide insights for healthcare policymakers and educators in Qatar. To improve HCPs' HL, future efforts should focus on tailoring educational programs to address the specific needs of nurses, older professionals, and those from diverse linguistic and cultural backgrounds. Furthermore, targeted HL training within different clinical settings, as suggested by the study's findings, could be a valuable approach to enhance health communication.[12,14,20]

This research sets the stage for further exploration of HL in the Gulf region, offering opportunities to deepen our understanding of this critical aspect of healthcare delivery. Future studies can build on these findings, addressing the identified influencing factors and their implications in more detail. As Qatar's healthcare system continues to advance, the integration of HL training into healthcare education and practice is essential to ensure the delivery of high-quality, patient-centered care in the country. By addressing the HL knowledge and experience of HCPs, Qatar can work toward optimizing patient-provider communication and ultimately improving healthcare outcomes for its diverse population.

## Research Implications and Recommendations

This study has unveiled essential insights into the HL knowledge and experience among HCPs in Qatar. These findings have various implications for healthcare practice, education, and policy in the region. Additionally, several recommendations emerge from this study to improve HL knowledge and experience among HCPs in Qatar.

Based on the observed differences in HL knowledge among healthcare professions, healthcare educational institutions in Qatar should consider the development of tailored educational programs. These programs should aim to enhance the HL knowledge of HCPs, with specific modules designed for nurses to address the identified gaps in their

understanding.[9,26] Moreover, HCPs, particularly those with more extended job experience and older age, should be encouraged to engage in ongoing professional development programs. These programs can help ensure that HCPs remain up to date with the latest advancements in HL, communication, and patient education. By fostering a culture of continuous learning, healthcare professionals can maintain their competencies in a rapidly evolving field.[14–16]

Future HL interventions should incorporate profession-specific training programs tailored to the unique roles and responsibilities of healthcare providers. For example, nurses, who often serve as the primary point of contact for patient education, would benefit from training focused on clear health communication, teach-back techniques, and culturally sensitive patient interactions.[27,28] Similarly, physicians may require more emphasis on shared decision-making and integrating HL principles into clinical consultations, while allied health professionals may need targeted training on simplifying complex health information for diverse patient populations.[29] Developing customized HL training modules that integrate interprofessional education for different HCP groups will enhance their ability to address patients' HL needs effectively, ultimately improving health outcomes and patient engagement.[30]

In light of the findings that HCPs of Arabic nationality or race exhibit lower HL knowledge, there is a need for health literacy training rather than solely cultural competency training. The use of an English-language questionnaire may have influenced the results, potentially impacting participants whose primary language is not English. Future studies should consider linguistic adaptations or multilingual assessments to ensure a more accurate evaluation of HL knowledge. These training programs can be customized to address the specific needs of HCPs working in areas such as Pediatric Rehabilitation Medicine Clinics and Obstetric Clinics. They should focus on the practical application of HL knowledge in these specialized contexts.[10,14,20]

To further improve HL experience among HCPs, institutions should consider offering structured and domain-specific HL training tailored to different clinical settings. These training programs can be customized to address the specific needs of HCPs working in areas such as Pediatric Rehabilitation Medicine Clinics and Obstetric Clinics. By integrating HL-focused education into these specialized settings, HCPs can develop the necessary skills to communicate effectively with patients, ensuring better health outcomes.[10,14,20]

Qatar may consider the development of a national HL policy that outlines standards for HL training and integration into healthcare practice. This policy can help guide healthcare institutions in Qatar in their efforts to enhance HL knowledge and experience among their staff. Furthermore, healthcare organizations in Qatar should integrate HL best practices into clinical care protocols and patient-provider interactions. This integration can involve the use of plain language, patient education materials with appropriate readability levels, and communication techniques that enhance patients' understanding and participation in their care.[12,23] Moreover, Healthcare organizations should not only focus on HCPs but also on patients. Initiatives to improve patient HL should be established, providing accessible and culturally appropriate patient education materials. These initiatives can empower patients to take an active role in managing their health.

Additionally, the influence of nationality, cultural background, and language proficiency on HL competencies should be further explored, as these factors were shown to impact HL knowledge in this study. Qatar's healthcare institutions can benefit from collaboration with international partners who have expertise in HL training and implementation. Partnerships can facilitate knowledge exchange and the adoption of best practices to improve HL in the country.[10,12] Furthermore, the findings of this study serve as a foundation for further research in Qatar and the Gulf region. Future research should delve deeper into the identified influencing factors, such as age, profession, and cultural background, to gain a more nuanced understanding of their impact on HL. Longitudinal studies can track the development of HL knowledge and experience among HCPs over time.

## Study Limitations

This study has several limitations that should be acknowledged. First, the research design is cross-sectional, which limits the establishment of causal relationships between variables. Additionally, the study sample was drawn from a single specialty hospital in Qatar, which may not fully represent all HCPs in the country. Furthermore, self-reported data are subject to response bias and may not always reflect participants' actual practices. The use of an English-language questionnaire may have influenced responses, particularly among non-native English speakers, highlighting the need for

future research to consider linguistic adaptations. Despite these limitations, this study provides valuable insights into HL knowledge and experience among HCPs in Qatar, offering a foundation for future research and interventions in this critical area.

## Conclusion

This cross-sectional study in Qatar explored HL knowledge and experience among HCPs, highlighting key factors such as age and prior training that influence their understanding of HL. The findings revealed varying levels of HL knowledge across different healthcare professions, emphasizing the need for tailored interventions and training programs. By addressing these gaps, HCPs can play a more significant role in supporting patient self-care practices and improving health outcomes.

To ensure a sustained impact, it is crucial to integrate HL training into national healthcare policies and professional curricula. Embedding HL education into medical, nursing, and allied health programs, as well as continuing professional development, will equip HCPs with the necessary skills to communicate complex health information effectively. Policymakers and healthcare institutions should prioritize HL-focused initiatives to build a healthcare workforce capable of improving patient engagement and adherence.

This study contributes to the growing body of HL research in healthcare, providing a foundation for future studies and interventions aimed at enhancing HL competencies. By institutionalizing HL training within healthcare policies and curricula, Qatar can strengthen its healthcare system and ensure sustained improvements in HL awareness and practice, ultimately enhancing the quality of care in Qatar and similar healthcare settings.

## Data Sharing Statement

The datasets generated and/or analyzed during the current study are not publicly available due research ethics restrictions but are available from the corresponding author on reasonable request.

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## Disclosure

None of the authors has any conflict of interest to disclose for this work.

## References

1. Marciano L, Camerini A-L, Schulz PJ. The role of health literacy in diabetes knowledge, self-care, and glycemic control: a meta-analysis. *J Gen Int Med*. 2019;34:1007–1017. doi:10.1007/s11606-019-04832-y
2. Niknami M, Mirbalouchzehi A, Zareban I, Kalkalinia E, Rikhtgarha G, Hosseinzadeh H. Association of health literacy with type 2 diabetes mellitus self-management and clinical outcomes within the primary care setting of Iran. *Austr J Primary Health*. 2018;24(2):162–170. doi:10.1071/PY17064
3. Karuranga S, Sørensen K, Coleman C, Mahmud AJ. Health literacy competencies for European health care personnel. *HLRP*. 2017;1(4):e247–e256. doi:10.3928/24748307-20171005-01
4. Alipour J, Payandeh A. Assessing the level of digital health literacy among healthcare workers of teaching hospitals in the southeast of Iran. *Info Med Unlocked*. 2022;29:100868. doi:10.1016/j.imu.2022.100868
5. Heijmans M, Uiters E, Rose T, et al. *Study on Sound Evidence for a Better Understanding of Health Literacy in the European Union*. European Commission Brussels; 2015.
6. Koh HK, Brach C, Harris LM, Parchman ML. A proposed 'health literate care model'would constitute a systems approach to improving patients' engagement in care. *Health Affairs*. 2013;32(2):357–367. doi:10.1377/hlthaff.2012.1205
7. Lambert M, Luke J, Downey B, et al. Health literacy: health professionals' understandings and their perceptions of barriers that Indigenous patients encounter. *BMC Health Services Res*. 2014;14(1):1–10. doi:10.1186/s12913-014-0614-1
8. Liu C, Wang D, Liu C, et al. What is the meaning of health literacy? A systematic review and qualitative synthesis. *Fam Med Commun Health*. 2020;8(2). doi:10.1136/fmch-2020-000351.
9. Sørensen K, Van den Broucke S, Fullam J, et al. Health literacy and public health: a systematic review and integration of definitions and models. *BMC Public Health*. 2012;12:1–13. doi:10.1186/1471-2458-12-80
10. Muhanga MI, Malungo JR. The what, why and how of health literacy: a systematic review of literature. *Int J Health*. 2017;5:107. doi:10.14419/ijh.v5i2.7745

11. Nair SC, Sreedharan J, Vijayan K, Ibrahim H. Estimation of health literacy levels in patients with cardiovascular diseases in a Gulf country. *BMC Health Services Res*. 2023;23(1):1–7. doi:10.1186/s12913-023-09364-0
12. Nair SC, Sreedharan J, Satish KP, Ibrahim H. Health literacy in a high income Arab country: a nation-wide cross-sectional survey study. *PLoS One*. 2022;17(10):e0275579. doi:10.1371/journal.pone.0275579
13. Shahid R, Shoker M, Chu LM, Frehlick R, Ward H, Pahwa P. Impact of low health literacy on patients' health outcomes: a multicenter cohort study. *BMC Health Services Res*. 2022;22(1):1148. doi:10.1186/s12913-022-08527-9
14. Murugesu L, Heijmans M, Rademakers J, Fransen MP. Challenges and solutions in communication with patients with low health literacy: perspectives of healthcare providers. *PLoS One*. 2022;17(5):e0267782. doi:10.1371/journal.pone.0267782
15. Hasannejadasl H, Roumen C, Smit Y, Dekker A, Fijten R. Health Literacy and eHealth: challenges and Strategies. *JCO Clin Cancer Informatics*. 2022;6:e2200005. doi:10.1200/CCI.22.00005
16. Bosworth HB. Challenges and strategies to improve patient health literacy and competencies. *Patient Intelligence*. 2010;19–25. doi:10.2147/PI.S9491
17. Macabasco-O'Connell A, Fry-Bowers EK. Knowledge and perceptions of health literacy among nursing professionals. *J Health Commun*. 2011;16(sup3):295–307. doi:10.1080/10810730.2011.604389
18. Cafiero M. Nurse practitioners' knowledge, experience, and intention to use health literacy strategies in clinical practice. *J Health Commun*. 2013;18(sup1):70–81. doi:10.1080/10810730.2013.825665
19. Rajah R, Ahmad Hassali MA, Jou LC, Murugiah MK. The perspective of healthcare providers and patients on health literacy: a systematic review of the quantitative and qualitative studies. *Perspectives Public Health*. 2018;138(2):122–132. doi:10.1177/1757913917733775
20. Mor-Anavy S, Lev-Ari S, Levin-Zamir D. Health literacy, primary care health care providers, and communication. *HLRP*. 2021;5(3):e194–e200. doi:10.3928/24748307-20210529-01
21. Cormier C. Health literacy: the knowledge and experiences of senior level baccalaureate nursing students (Doctoral dissertation). Available from ProQuest Dissertations and Theses database.(UMINo. 3244945). 2006.
22. Walker D, Howe C, Dunkerley M, Deupree J, Cormier C. The HLKES-2: revision and evaluation of the health literacy knowledge and experiences survey. *J Nurs Educ*. 2019;58(2):86–92. doi:10.3928/01484834-20190122-05
23. Nair SC, Satish KP, Sreedharan J, Ibrahim H. Assessing health literacy in the eastern and middle-eastern cultures. *BMC Public Health*. 2016;16:1–8. doi:10.1186/s12889-016-3488-9
24. Jukkala A, Deupree JP, Graham S. Knowledge of limited health literacy at an academic health center. *J Continuing Educ Nurs*. 2009;40(7):298–302. doi:10.3928/00220124-20090623-01
25. Schwartzberg JG, Cowett A, VanGeest J, Wolf MS. Communication techniques for patients with low health literacy: a survey of physicians, nurses, and pharmacists. *Ame J Health Behav*. 2007;31(1):S96–S104. doi:10.5993/AJHB.31.s1.12
26. Johnson A. Health literacy, does it make a difference? *Austr J Adv Nurs*. 2014;31(3):39–45. doi:10.37464/2016.334.1596
27. Johnson J, Khraim F, Wolsey C, Hasnani-Samnani Z. The influence of Health Literacy in (Mis) Communication & Comprehension of Medical English. In: Tweedie G, Johnson RC, editors. *Perspectives on Medical English as a Lingua Franca*. Newcastle Upon Tyne, UK: Cambridge Scholar Publishers; 2022:77–93.
28. Johnson J, Mohamed H, Lowe T, et al. Addressing the effectiveness of health literacy programs within the Gulf Corporation Council: an integrative review. *Health Promot Int*. 2024;39(3). doi:10.1093/heapro/daae062.
29. Bader M, Zheng L, Rao D, et al. Towards a more patient-centered clinical trial process: a systematic review of interventions incorporating health literacy best practices. *Contemporary Clinical Trials*. 2022;116:106733. doi:10.1016/j.cct.2022.106733
30. El-Awaisi A, El Hajj MS, Lising D, Schwartz F, Paulenko T. Chapter 17 - Advancing health literacy through interprofessional education: strategies for collaborative learning and practice. In: Awaisu A, Munsour EE, Aslani P, Hussain R, Z-U-D B, editors. *Health Literacy in Medicines Use and Pharmacy*. Academic Press; 2025:265–275.