

# BMJ Open Exploring health literacy competencies towards patient education programme for Chinese-speaking healthcare professionals: a Delphi study

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## ABSTRACT

**Objectives:** To achieve consensus on a set of competencies in health literacy practice based on a literature review and expert consultation.

**Setting:** Hospitals and community health centres in Taiwan.

**Method:** A 2-stage modified Delphi study involving a literature review was conducted, followed by qualitative interviews and 3 rounds of email-based data collection over a 3-month period in 2011.

**Participants:** 15 Chinese healthcare practitioners with more than 6 months' experience in patient education were interviewed to collect data on health literacy practice. 24 experts (12 academic scholars in health literacy and 12 professionals with training related to health literacy practice) were invited to participate in the Delphi process.

**Results:** Qualitative data from the interviews were analysed and summarised to form 99 competency items for health literacy practice, which were categorised into 5 domains of health literacy practice including those pertaining to knowledge and skills. Consensus was reached on 92 of 99 competencies, using a modified Delphi technique.

**Conclusions:** The 92 competencies in health literacy practice embraced core components of patient education in the Chinese healthcare profession.

## INTRODUCTION

Health literacy, as defined by the WHO, represents cognitive and social skills that determine the individual's motivation and ability to access, understand, and use information in ways that promote and maintain good health.<sup>1</sup> To determine the contribution that health literacy makes to health disciplines, the rediscovery of health education should be explored in alliances between health and educational sectors in pursuing the goal of improved literacy levels in the population.<sup>2</sup> Accordingly, investment in sustainable health education requires competent healthcare professionals who contribute

## Strengths and limitations of this study

- To the best of our knowledge, this was the first study to develop a competency guide in health literacy practice for Chinese health professionals.
- These competencies embraced core components of patient education in healthcare.
- The main limitation of the study was that only 24 experts were recruited for the panel; however, we adopted subjective and objective methods to generate competencies in health literacy practice prior to achieving consensus in the Delphi process.
- Competencies in health literacy practice may provide a starting point for increased integration of health literacy concepts and skills into professional and continuing education programmes.

to the improvement of healthcare quality and reduce medical error.<sup>3</sup>

Health literacy practice involved the use of a set of patient-centred protocols and strategies to mitigate the effects of limited health literacy<sup>4 5</sup> which should be considered in health education programmes. Healthcare providers' competencies in health literacy practice are vital in ensuring significant health outcomes through the efficiency of appropriate care plans.<sup>6</sup> Healthcare professionals demonstrating assessment qualifications in their clinical practice could meet clients' care needs and could help design appropriate interventions to enhance self-care abilities at a level that clients understand.<sup>7</sup> However, previous studies have shown that healthcare providers overestimate patients' health literacy because of misunderstanding or limited cognition concerning health literacy.

Health literacy as an outcome of health education and its practices, which has been explored in previous studies, could be categorised into three groups: health literacy assessment<sup>8</sup> communication activities<sup>9</sup> and

educational strategies for patients with low health literacy (LHL).<sup>10</sup> Although the importance of health literacy practice and use of a variety of health literacy techniques varied significantly across health disciplines, such as nutrition, nursing, and pharmacy,<sup>11</sup> previous studies have demonstrated inadequate ability in health professionals with respect to limited recognition and awareness of health literacy,<sup>12</sup> confidence<sup>9</sup> and skills<sup>11 13</sup> in caring for those with LHL. It is important that health professionals possess adequate awareness, knowledge, skills, and attitudes when treating patients with LHL.<sup>4</sup> Accordingly, identifying key elements of competencies in health literacy practice is an essential step in promoting the quality of care provided for individuals with LHL.<sup>14</sup> In this study, we reviewed the literature to identify the core domains of health literacy practice and use it as a guideline in interviews designed to collect information regarding health professionals' competencies. The Delphi technique was used to establish consensus on the proposed competencies.

## METHODS

A modified Delphi technique was used to achieve the aims of the study. The first round of the Delphi process was replaced by a literature review and face-to-face interviews designed to collect data regarding health literacy practice from clinical settings. This study was approved by the institutional review board at the institution with which the authors were affiliated.

### Identifying the key domains of competencies in health literacy practice

We searched Medline, PsycINFO, PubMed and OVID nursing collections for original studies and expert review papers concerning health literacy practice between 2005 and 2015. We entered 'health literacy' as the main keyword in the search to retrieve the relevant literature, and other related terms, such as training, teaching, practice, education and profession, were added with the Boolean operator 'AND' to refine our search. Only those literature on recommendations for health professionals related to health were included. However, articles which belonged to interviewing skills, cultural competency and motivational interviewing were generally not included.

### Qualitative interviews with healthcare professionals to generate competency items for health literacy practice

The results of the literature review were used as interview guidelines to structure the interview framework. The recommended health literacy items identified through literature review were also confirmed in the interview process. The four interview questions included 'describe the attributes of patients who were difficult to teach', 'describe ways in which clients with LHL can be assisted', 'describe the way that assessments are

conducted', and 'describe the communication techniques used in your patient education practice'.

First, two experienced health educators were recruited via referrals from hospital managers. Snowball sampling, also known as accidental sampling, was used to identify other suitable interviewees, and additional participants were introduced by the interviewees. After agreeing to participate, they engaged in recorded one-to-one interviews conducted by trained investigators. At this stage, 15 healthcare practitioners with more than 6 months' experience in patient education, including five nurses working in clinical, internal and surgical wards; four case managers; two health educators; three nutritionists; and a pharmacist, were interviewed between 27 September and 12 November 2011. Thirteen interviews were conducted at participants' offices at the hospital, and two interviews with health educators were conducted at community health centres; the interviews lasted between 60 and 90 min. All interviews were conducted by authors with qualitative interview and health education experience. Moreover, the interview transcripts were analysed by the principle author, and the results were validated by all authors.

### Delphi process

A Delphi process is defined as a multistage survey that ultimately attempts to achieve consensus on an important issue; its basic characteristics include anonymity, iteration, controlled feedback and statistical aggregation to create a group response.<sup>15 16</sup> Moreover, the method is highly recommended for issues that have not been explored in-depth and it is based on the premise that pooled intelligence enhances individual judgement and captured the opinions through an anonymous enquiry process.<sup>17</sup> The questionnaire for the second round of data collection contained the results of the first round, mainly in the form of median or arithmetic mean values and distribution parameters.<sup>18</sup>

The first round of data collection was replaced by a literature review and face-to-face interviews to elicit the opinions of the expert panel. The second to fourth rounds involved questionnaires distributed via mail and followed the classic Delphi approach.

### Expert recruitment

With respect to the sample size for the Delphi process, Parente and Anderson-Parente<sup>19</sup> recommended a lower limit of 10 participants after the deduction of potential dropouts. In Taiwan, health literacy research has attracted academic and practical experts since 2008, and the majority of the health literacy literature has focused on patient factors. Since the number of experts with experience in health literacy research or practice was limited, we searched for Delphi technique experts from a list of professionals who had received a government-funded health literacy grant. In addition, we examined a list of professionals who had published research articles in the area. Approximately eight Delphi technique

**Table 1** The results of the literature review regarding health literacy practice in health professionals between 2005 and 2015

Themes in the literature	n (%)	Source
Assessment methods for low health literacy	5 (29.4)	14, 21–24
Appropriate written patient education materials or resources	5 (29.4)	14, 21, 22, 25, 26
Communication strategies	9 (52.94)	3, 14, 21, 23–25, 27–29
Understanding or knowledge of health literacy	8 (47.05)	3, 12, 14, 22, 23, 27, 28, 30
Association between literacy or health literacy and patient outcomes	1 (5.8)	27
Evaluating health literacy education	2 (11.7)	31, 32
Teaching information and methods	2 (11.7)	33, 34
Implementing a health literacy programme for patients	2 (11.7)	12, 33

experts and recommended health professionals (who were trained in health literacy practice), were invited to participate in the study. Twenty-four experts (12 academic scholars in health literacy and 12 professionals with training related to health literacy practice) were invited to participate in the second to fourth rounds of data collection.

### Delphi procedure

The modified Delphi method used in this study consisted of three rounds of email-based data collection, each of which lasted for 1 month during a 3-month period from January to April 2012. In each round, the experts were invited to rate the importance of each question using a five-point Likert-type scale ranging from 1 (not important) to 5 (very important) as the grading system. These individuals were aware that questions scored higher than 3 would be considered as important items. Group consensus was achieved if the criteria, including a mean and mode of at least 4.0 and a SD of  $\leq 1$  were met. The quartile deviation was also provided to experts for consensus consideration in the Delphi process. Moreover, we also checked items that were ranked as 4 or greater on a Likert scale of 1–5 by more than 80% of respondents in the final round.

The questionnaire contained space for an answer and feedback or further comments for each statement. In statements for which consensus was not achieved, feedback and comments were used to adjust the statement for the following round. The statements for all three rounds of the Delphi process were retained to ensure that they were all equally as likely to gain the highest importance rating and level of consensus.<sup>20</sup> Experts were provided with feedback and a summary of the results of the previous round, and their individual modified and amended items were colour coded to prevent confusion during reading in the second and third rounds.

## RESULTS

### Literature review

Literature searches using the keywords ‘training’, ‘teaching’, ‘competence’ and ‘profession’ in combination with ‘health literacy’ produced 35, 35, 5 and 55 articles,

respectively. A total of 106 articles were searched. After excluding duplicates (n=14), anonymous authors (n=6), non-English articles (n=6), and subjects that were not relevant to the health profession (n=18), 62 articles were relevant to the topic. Of these, 43 were discussion articles, and 19 were empirical studies, of which two were excluded, as the full text was not available. In the 17 complete articles, communication strategies (n=9, 52.94%) and understanding health literacy knowledge (n=8, 47.05%) were the most frequently mentioned health literacy practices. Assessment methods for LHL and appropriately written education materials or resources for patients were also crucial to health literacy practice. None of these studies or discussion articles were Chinese (table 1).

### Qualitative interview for health professionals

The deductive content analysis described by Elo and Kyngäs<sup>35</sup> was used to confirm four domains of health literacy practice, based on a review of related literature. In total, 648 meaningful statements were extracted from the interviews. Interview results were summarised as health literacy practices and used to compare categorisation results from the literature review for further classification. Thereafter, 99 meaning units were identified and classified into two domains with six subdomains including those pertaining to knowledge (ie, knowledge of health literacy and recognition of the characteristics of patients with LHL) and skills (ie, designing a patient education plan for patients with LHL, assessing health literacy assessment, adopting low-literacy health education strategies and evaluating an educational plan for patients with LHL attributes). In the analysis, 56 questions were derived from interviews, and 43 questions were selected from health literacy research publications.

### The consensus results of the Delphi process

Twenty-four experts have completed each round of Delphi survey. In the second round, 10 of 99 items did not reach consensus, eight items had mean or mode scores between 3.5 and 4.0 with a SD of  $>1$ , and two items had mean or mode scores between 3.0 and 3.5. In the third round, none of the 99 items had a mean or mode score of  $<3.0$ , while 92 reached consensus with 80% agreement, four had mean scores between 3.5 and

3.9 and three had scores of 4.0 with a SD of >1. Ultimately, in the final questionnaire, which was used in the fourth round and created according to experts' opinions, healthcare professionals' competencies in health literacy practice consisted of 92 consensus items, with seven items deleted (table 2).

## DISCUSSION

In Taiwan and the rest of the world, most health literacy studies have focused on the patient's perspective. Only a few have explored health professionals' competencies in promoting patients' health literacy. Understanding health professionals' ability in health literacy practice is a basic step in establishing practice-based competencies. Delphi studies lack a consistent and well-defined standard for the application of group consensus.<sup>40</sup> In addition to the predetermined levels of agreement mentioned in previous study,<sup>14</sup> we used other consensus standards suggested by de Villers<sup>17</sup> including the values of mean, SD and IQR to understand the level of consensus or lack thereof.

Although assessment of health literacy knowledge is an essential component of health literacy practices for health professionals, the result of our study has found that the measurement of health literacy knowledge could be either subjective or objective. The subjective measurement involved the participant's perceived knowledge of health literacy<sup>29</sup> or the health literacy knowledge demonstrated by the participants.<sup>41</sup> The objectives of assessment of health literacy knowledge performed in the current study was similar to that performed in the study conducted by Devraj *et al*,<sup>36</sup> in which health literacy knowledge was designed in the form of test items that participants were required to answer to determine their health literacy levels. This could help in the evaluation of health literacy levels in untrained health professionals.

The items used in the current study were similar to those used in other studies, in that the assessment included the definition of health literacy,<sup>11</sup> reading levels in patients with LHL,<sup>10</sup> essential support for patients with LHL<sup>23</sup> and the consequences of LHL.<sup>38</sup> Kripalani *et al*,<sup>23</sup> Devraj *et al*,<sup>36</sup> and Coleman *et al*<sup>14</sup> classified the signs of LHL as knowledge items. For clearly differential conceptual knowledge or practical recognition of LHL, we grouped the signs of LHL confirmed during the interviews in the dimension of recognition of the attributes of patients with LHL. When health professionals adopted appropriate methods embedded health literacy competences to provide care for them, this attributes may not be the problems in healthcare settings.<sup>23</sup> Undoubtedly, it is important for health professionals that they need to be aware of and recognise these signs when they conduct the assessment for patients.

The reason for this discrepancy could be that the study participants were physicians in 3 of the 17 studies and believed that health literacy was a communication skill. Coleman *et al*<sup>14</sup> used the same five crucial domains

to examine competencies in health literacy practice but divided the competencies into educational and practice domains. However, we incorporated a literature review and interviews into an educational process that aimed to meet the WHO's goals of promoting health literacy to the general public via educational systems.<sup>4</sup> Extending the application of written or oral communication skills, as it relates to health literacy competencies in health education programmes, is critical to the improvement of public health literacy.

The competency items used in the current study were similar to those used in previous studies. However, because of differences in the first round of Delphi process and the Chinese descriptions in the practical narratives confirmed during the interviews, the meanings of the items somewhat differed from those provided by Coleman *et al*.<sup>14</sup> The language differences could be considered as a study limitation. In the current study, we integrated the literature and interviews to produce the competencies of health literacy practice, which might be suitable for use with Chinese-speaking professionals.

It is worth noting that five of the seven questions for which a consensus could not be reached were interview items. These items were related to health education and captured via interview but have not been mentioned specifically in the health literacy literature; therefore, the experts could not reach consensus. The remaining two questions for which a consensus could not be reached were literature items. It is possible that, although the concepts originated from the literature, the experts considered the consent and health education materials analysed during the interviews duplicate information. K14 was a detailed description of LHL caused by communication barriers, which resulted from adverse effects on the patient's health, but it was also a repetition of K6.

Potential biases in traditional Delphi studies include the imposition of preconceptions on respondents and the use of poor techniques to summarise and present group responses.<sup>42</sup> To avoid the drawbacks involving the imposition of preconceptions on respondents, a thorough review of the literature concerning the modified Delphi method was performed to collect information regarding competencies in health literacy practice, and qualitative interviews were conducted to confirm those generated by healthcare professionals in their own settings. This approach could increase the diversity of the item pool. Irrelevant or duplicate questions could be removed after the experts have reached a consensus.

## CONCLUSIONS

The health literacy competencies identified in this study constitute an important and necessary step in the systematic design and evaluation of curricula required to produce a healthcare workforce that both accounts for and addresses the issues surrounding LHL. Most studies have suggested that health literacy and health education or communication skills are closely related. The present

**Table 2** Results of consensus group ratings for healthcare professionals' competencies in health literacy practice (n=24)

Competency item	Source	Round accepted	Final round				
			Percentage of $\geq 4$	Mean	Mode	SD	QD
<b>Knowledge domain</b>							
<i>Knowledge of health literacy</i>							
K1. Health literacy refers only to a person's ability to read. (False)	Devraj <i>et al</i> <sup>36</sup>	2	83.3	4.0	4	1.0	0.5
K2. Adequate health literacy is the ability to read, understand, and process health information. (False)	Devraj <i>et al</i> <sup>36</sup>	2	91.7	4.3	4	0.7	0.5
K3. Those with low health literacy have poorer health outcomes relative to those with sufficient health literacy. (True)	Institute of Medicine <sup>4</sup>	2	87.5	4.6	5	0.7	0.5
K4. Age is a risk factor that decreases health literacy. (True)	Devraj <i>et al</i> <sup>36</sup>	3	83.3	4.0	4	0.7	0.5
K5. Patients with high educational levels may present with low health literacy. (True)	Interview	2	87.5	4.7	5	0.7	0.3
K6. Limited health literacy can produce barriers to clear, effective communication. (True)	Schwartzberg <i>et al</i> <sup>11</sup>	2	87.5	4.7	5	0.7	0.3
K7. Using an appropriate tool is the best way to assess health literacy and identify patients with low health literacy. (True)	Institute of Medicine <sup>4</sup>	2	83.3	4.2	5	1.0	0.8
K8. Individuals with high educational levels also need an easy method of learning complicated health information. (True)	Interview	2	83.3	4.3	5	1.0	0.8
K9. The general rule is to write consent documents at a 7th-grade reading level. (True)	Institute of Medicine <sup>4</sup>	2	83.3	4.0	4	1.0	1.0
K10. Suitable educational materials designed for people with low literacy should be understandable at levels below the 6th grade in elementary school. (True)	Institute of Medicine <sup>4</sup>	Delete	54.2	3.8	3	1.1	1.0
K11. People with low health literacy need extra medical support and therefore have higher healthcare costs. (True)	Weiss and Palmer <sup>37</sup>	2	87.5	4.4	5	0.9	0.8
K12. Health education materials should be written at or below a 7th-grade reading level. (True)	Institute of Medicine <sup>4</sup>	2	83.3	4.0	4	1.0	1.0
K13. Health literacy could affect physician-patient communication. (True)	Schwartzberg <i>et al</i> <sup>11</sup>	2	87.5	4.7	5	0.7	0.3
K14. Persons with low health literacy experience limited comprehension of health information, leading to care problems. (True)	Institute of Medicine <sup>4</sup>	Delete	54.2	3.4	4	1.3	1.0
<i>Recognition of attributes of patients with low health literacy (If you agree the attributes of LHL listed in following items, please marked <math>\checkmark</math> in the box.)</i>							
Patients with low health literacy...							
A1. May pretend to understand what the health educator says and ask for help at home. <input type="checkbox"/>	Interview	Delete	45.8	3.8	3	0.8	0.8
A2. Will say, 'I can do this, there is no need to teach me' to cover up for their lack of understanding. <input type="checkbox"/>	Interview	2	91.7	4.6	5	0.7	0.5
A3. Will repeat the same questions. <input type="checkbox"/>	Interview	2	83.3	4.4	5	1.0	0.5
A4. Will not tell you if they cannot read. <input type="checkbox"/>	Devraj <i>et al</i> <sup>36</sup>	3	83.3	4.0	4	1.0	1.0
A5. Are more likely to misinterpret medication instructions provided on prescription labels. <input type="checkbox"/>	Devraj <i>et al</i> <sup>36</sup>	2	87.5	4.1	4	0.8	0.8
A6. Will easily misunderstand prescription instructions. <input type="checkbox"/>	Devraj <i>et al</i> <sup>36</sup>	2	83.3	4.4	5	1.0	0.5
A7. Cannot understand medication indications. <input type="checkbox"/>	Kripalani <i>et al</i> <sup>23</sup>	2	83.3	4.6	5	1.0	0.3

Continued

Table 2 Continued

Competency item	Source	Round accepted	Final round				
			Percentage of $\geq 4$	Mean	Mode	SD	QD
A8. Will often bring family members along when talking to healthcare professionals. <input type="checkbox"/>	Devraj <i>et al</i> <sup>36</sup>	2	83.3	4.4	5	1.0	0.5
A9. Will make excuses to avoid reading health information materials when given material to read. <input type="checkbox"/>	Kripalani <i>et al</i> <sup>23</sup>	2	87.5	4.4	5	0.7	0.5
A10.* Often report about their medicine. <input type="checkbox"/>	Devraj <i>et al</i> <sup>36</sup>	2	87.5	4.4	5	0.7	0.5
A11. Only seek assistance when symptoms worsen. <input type="checkbox"/>	Jukkala <i>et al</i> <sup>38</sup>	2	87.5	4.7	5	0.7	0.3
A12. Cannot understand medical forms and are therefore unable to complete them accurately. <input type="checkbox"/>	Institute of Medicine <sup>4</sup>	2	87.5	4.7	5	0.7	0.3
A13. Are likely to put a lot of folded paper in their pockets or wallets. <input type="checkbox"/>	Kripalani <i>et al</i> <sup>23</sup>	3	83.3	4.0	4	0.8	0.8
A14. Do not make necessary appointments or attend follow-up. <input type="checkbox"/>	Institute of Medicine <sup>4</sup>	2	87.5	4.3	4	0.7	0.5
A15. May be likely to pose few questions to professionals. <input type="checkbox"/>	Interview	2	83.3	4.4	5	0.9	0.8
A16. Cannot talk about how to take medicine. <input type="checkbox"/>	Kripalani <i>et al</i> <sup>23</sup>	2	87.5	4.1	4	0.8	0.8
<b>Skill domain</b>							
<i>Designing a health education plan for patients with low health literacy</i>							
D1. Handle the psychical barriers to conducting health behaviours for clients	Interview	2	87.5	4.6	5	0.7	0.5
D2. Cooperate with other professionals to design health education plans	Interview	2	87.5	4.7	5	0.7	0.3
D3. Design audiovisual teaching materials	Interview	2	87.5	4.7	5	0.7	0.3
D4. Have the language ability to handle different patients	Interview	2	87.5	4.6	5	0.7	0.5
D5. Provide group health education	Interview	Delete	79.2	4.0	5	1.1	0.5
D6. Implement behaviour modification counselling	Interview	2	83.3	4.4	5	1.0	0.5
D7. Design computer-based teaching aids	Interview	2	83.3	4.6	5	1.0	0.3
D8. Design health education flyers with <20% text	Interview	2	83.3	4.4	5	1.0	0.5
D9. Apply appropriate education theories in the curriculum	Interview	2	83.3	4.7	5	1.0	0.0
D10. Establish a personal profile of teaching materials	Interview	2	87.5	4.7	5	0.7	0.3
D11. Design a teaching plan for multicultural populations	Interview	2	87.5	4.6	5	0.7	0.5
D12. Design education materials for illiterate individuals	Interview	2	83.3	4.4	5	1.0	0.5
<i>Assessing health literacy for patients with low health literacy</i>							
Interview							
As1. Determine the right teaching time for various clients	Interview	2	87.5	4.7	5	0.7	0.3
As2. Determine potential education barriers based on patient characteristics	Interview	2	83.3	4.7	5	1.0	0.0
As3. Apply appropriate tools to assess patient health literacy levels	Institute of Medicine <sup>4</sup>	2	83.3	4.7	5	1.0	0.0
As4. Conduct health assessments by collecting personal, organisational, and community data	Institute of Medicine <sup>4</sup>	2	87.5	4.8	5	0.7	0.0
As5. Identify the classical attributes of low health literacy prior to teaching	Kripalani <i>et al</i> <sup>23</sup>	2	87.5	4.8	5	0.7	0.0
<i>Adopting low-literacy health education strategies</i>							
S1. Use plain language instead of medical jargon	Kripalani <i>et al</i> <sup>23</sup>	2	87.5	4.8	5	0.7	0.0
S2. Use storytelling to make clients understand	Kripalani <i>et al</i> <sup>23</sup>	2	87.5	4.7	5	0.7	0.3
S3. Use metaphors to explain the disease to clients	Kripalani <i>et al</i> <sup>23</sup>	2	87.5	4.7	5	0.7	0.3
S4. Use life-oriented examples to explain the care that patients need	Interview	2	83.3	4.4	5	1.0	0.5

Continued

Table 2 Continued

Competency item	Source	Round accepted	Final round				
			Percentage of $\geq 4$	Mean	Mode	SD	QD
S5. Teach using language the student understands	Interview	2	83.3	4.7	5	1.0	0.0
S6. Explain health education using materials available to the patient	Interview	2	83.3	4.7	5	1.0	0.0
S7. Connect new learning with previous experience	Interview	2	83.3	4.7	5	1.0	0.0
S8. Limiting curricula to 2 or 3 new topics	Schwartzberg <i>et al</i> <sup>11</sup>	2	83.3	4.7	5	1.0	0.0
S9. Use the teach-back technique	Kripalani <i>et al</i> <sup>23</sup>	2	83.3	4.6	5	1.0	0.3
S10. Teach repeatedly when clients cannot understand the teaching content	Williams <i>et al</i> <sup>39</sup>	2	83.3	4.7	5	1.0	0.0
S11. Teach difficult materials repeatedly	Interview	Delete	50	3.4	4	1.1	0.5
S12. Use the demonstrate-do technique	Interview	2	83.3	4.7	5	1.0	0.0
S13. Provide health education materials and encourage clients to discuss them with their families	Interview	2	87.5	4.8	5	0.7	0.0
S14. Provide health education materials with 'questions and answers'	Interview	2	83.3	4.7	5	1.0	0.0
S15. Use simple words to explain care plans and related treatment	Schwartzberg <i>et al</i> <sup>11</sup>	2	87.5	4.8	5	0.7	0.0
S16. Base decisions regarding teaching focus on treatment progress	Interview	2	83.3	4.6	5	1.0	0.3
S17. Summarise the key points of teaching at the end of the interview	Kripalani <i>et al</i> <sup>23</sup>	2	87.5	4.8	5	0.7	0.0
S18. Instruct others in the creation of a care plan rather than explaining the disease or condition	Interview	2	95.8	4.8	5	0.4	0.3
S19. Use pictorial methods, rather than words, to emphasise importance of issues for clients	Kripalani <i>et al</i> <sup>23</sup>	2	83.3	4.7	5	1.0	0.0
S20. Provide self-designed sticks to allow clients to mark their records	Interview	2	87.5	4.8	5	0.7	0.0
S21. Use the one-by-one method and pictorial image material	Interview	2	87.5	4.8	5	0.7	0.0
S22. Use media to benefit teaching outcomes	Interview	2	83.3	4.7	5	1.0	0.0
S23. Design teaching materials as teaching aids in health education	Interview	2	83.3	4.4	5	1.0	0.5
S24. Use online or internet teaching	Interview	2	83.3	4.7	5	1.0	0.0
S25. Consider disobedient behaviour to be temperate coping behaviour	Interview	2	83.3	4.2	5	1.0	0.8
S26. Offer more encouragement to patients and illiterate clients	Interview	2	83.3	4.7	5	1.0	0.0
S27. Understand clients' disobedient behaviours	Interview	2	87.5	4.6	5	0.7	0.5
S28. Invite caregivers to participate in the teaching plan	Interview	2	83.3	4.6	5	0.9	0.5
S29. Encourage clients and their families and clarify unclear parts of teaching via telephone	Interview	2	87.5	4.8	5	0.7	0.0
S30. Present oneself to clients as a resource	Interview	2	87.5	4.7	5	0.7	0.3
S31. Create an environment of mutual trust	Institute of Medicine <sup>4</sup>	2	87.5	4.8	5	0.7	0.0
S32. Encourage sharing between clients	Interview	2	87.5	4.8	5	0.7	0.0
S33. Create an embarrassment-free environment	Institute of Medicine <sup>4</sup>	2	83.3	4.6	5	0.9	0.5
S34. Ensure clients' confidentiality	Interview	Delete	79.2	4.0	5	1.1	0.0
S35. Encourage clients to take notes during interviews	Interview	2	87.5	4.8	5	0.7	0.0

Continued



Table 2 Continued

Competency item	Source	Round accepted	Final round			
			Percentage of $\geq 4$	Mean	Mode	SD QD
S36. Teach clients to ask, 'What is my main problem?'	Institute of Medicine <sup>4</sup>	2	87.5	4.8	5	0.7 0.0
S37. Teach clients to ask, 'What do I need to do?'	Institute of Medicine <sup>4</sup>	2	87.5	4.8	5	0.7 0.0
S38. Teach clients to ask, 'What can I do to help my body?'	Institute of Medicine <sup>4</sup>	2	87.5	4.7	5	0.7 0.3
S39. Encourage clients to use the question-posing method	Interview	2	87.5	4.8	5	0.7 0.0
S40. Encourage clients to talk about what doctors say to them	Interview	2	87.5	4.8	5	0.7 0.0
S41. Encourage clients to demonstrate learnt skills to determine their understanding	Interview	2	87.5	4.8	5	0.7 0.0
S42. Ask clients to provide evidence of their health behaviour	Interview	2	87.5	4.8	5	0.7 0.0
S43. Make eye contact with patients to ensure concentration	Interview	2	83.5	4.6	5	0.9 0.5
S44. Ask clients to restate the key points that they have learnt	Interview	2	87.5	4.8	5	0.7 0.0
S45. Pay attention to questions that patients ask repeatedly	Interview	2	87.5	4.8	5	0.7 0.0
S46. Pay attention to non-verbal (eg, facial) expressions to determine whether the patient has understood	Interview	2	87.5	4.8	5	0.7 0.0
<i>Evaluating an educational plan for patients with low health literacy</i>						
E1. Build up the right evaluation criteria for health literacy practice	Interview	2	83.3	4.7	5	1.0 0.0
E2. Conduct appropriate evaluations to demonstrate the effectiveness of health literacy practice	Interview	2	83.3	4.1	5	1.0 1.0
E3. Modify education plans to fit patients' problems	Interview	2	87.5	4.7	5	0.7 0.3
E4. Illustrate the appropriate effectiveness of teaching based on health literacy	Interview	2	87.5	4.6	5	0.7 0.5
E5. Encourage clients with low health literacy to share the successful action outcome	Interview	Delete	79.2	4.0	5	0.9 0.5
E6. Design various evaluation approaches according to clients' health literacy levels	Interview	2	87.5	4.8	5	0.7 0.0

\*Reverse item.

A: recognition of attributes of patients with low health literacy; As: assessing health literacy for low health literate patients; D: designing a health education plan for patients with low health literacy; E: evaluating an educational plan for patients with low health literacy; K: knowledge of health literacy; S: adopting low-literacy health education strategies. QD, Quartile Deviation.



study applied these education principles in a holistic and continuous process to construct an index for assessing practice competencies.

A modified Delphi technique was used to achieve consensus on health literacy competencies for Chinese-speaking healthcare professionals. Further empirical studies are required to validate whether the 92 items identified can be grouped into the six domains of competencies in health literacy practice. Moreover, further work is required to prioritise these 92 items, and educational research is required to validate the competencies in health literacy practice and determine which should be taught, which healthcare professionals should receive training, which settings should be used and which teaching methods should be adopted to improve patient-centred outcomes.

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