

## ORIGINAL PAPER

## Assessment of Slovak nurses' Health Literacy Knowledge and Experience (HLKES-2): a preliminary study

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### Abstract

**Aim:** The study aimed to assess nurses' knowledge and experience of health literacy using the Slovak 14-item HLKES-2 (Health Literacy Knowledge and Experience Survey 2) and explore its links with selected variables. **Design:** Quantitative, cross-sectional study. **Methods:** The sample consisted of 255 Slovak nurses. The data were analyzed using basic statistical methods (Mann–Whitney U test and Spearman's correlation) and we evaluated the psychometric properties of the tool. **Results:** The results indicated low levels of health literacy knowledge (39.65%;  $4.43 \pm 2.58$ ) and moderate levels of experience with health literacy ( $5.05 \pm 2.58$ ). Nurses' knowledge was not related to their education, workplace, or prior training in health literacy ( $p > 0.05$ ). Nurses working in general wards reported higher levels of health literacy experience compared to those in intensive care units ( $p = 0.018$ ). The analysis showed low reliability for the ten multiple-choice knowledge items and good reliability for the four Likert-type experience items. **Conclusion:** The findings indicate that nurses demonstrated substantial practical experience but possessed limited knowledge of health literacy. These results underscore the need to strengthen education in this area to enhance patient communication.

**Keywords:** experience, health literacy, HLKES-2, knowledge, nursing, Slovakia.

### Introduction

Health literacy is a multidimensional concept encompassing an individual's ability to access, comprehend, and effectively use health information to enhance their health, well-being, and overall quality of life (Sørensen et al., 2012). Limited health literacy is linked to worse health outcomes and less effective use of healthcare services, whereas higher health literacy contributes positively to individuals' health and overall quality of life (Scrivner et al., 2019; Shahid et al., 2022). Patients with low health literacy often face difficulties in navigating the healthcare system. However, communication strategies employed by healthcare professionals, along with clear communication procedures, can significantly enhance patient care (Sheehan et al., 2021). Enhancing health literacy across the population is essential for better individual health outcomes (Herndon et al., 2011) and is a key factor

in reaching the targets set by the 2030 Agenda for Sustainable Development (World Health Organization, 2016). Addressing low health literacy requires collaboration across various healthcare professions, with nurses holding a key role, as improving health literacy is an integral aspect of their professional practice (Ludwick, 2009). Nurses should customize their communication approaches to accommodate patients with low health literacy (Cutilli & Christensen, 2024). Increasing awareness of health literacy has great potential to improve communication strategies and collaboration with patients, ultimately leading to better health outcomes (Čakloš & Bóriková, 2023). Limited health literacy knowledge among nurses may impede effective communication with patients (Macabasco-O'Connell & Fry-Bowers, 2011). Research has shown that nurses frequently demonstrate limited understanding of health literacy (Chang et al., 2020; Güner & Ekmekci, 2019; Nantsupawat et al., 2020; Nesari et al., 2019), indicating that support for health literacy is not yet fully incorporated into nursing practice. To measure nurses' knowledge and experience in this area,

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Cormier & Kotrlik (2009) developed the Health Literacy Knowledge and Experience Survey (HLKES). A shortened version, the HLKES-2, was later introduced by Walker et al. (2019), comprising ten knowledge items and four experience items. The HLKES-2 is recognized as a reliable tool for assessing nurses' knowledge and experience regarding health literacy, including fundamental health literacy principles, effective communication strategies, and the behaviors of individuals with low health literacy (Walker et al., 2019). This tool has been utilized in studies involving both nurses (Al-Fayyadh et al., 2022; Angelopoulou et al., 2023; Bertiz et al., 2024; Subedi et al., 2022) and nursing students (Haney & Yoğurtcu, 2023; Walker et al., 2019). To date, no studies in Slovakia have examined Slovak nurses' knowledge and experience related to health literacy.

## Aim

This study aimed to assess nurses' health literacy knowledge and experience using the Slovak version of the 14-item HLKES-2 (Health Literacy Knowledge and Experience Survey 2), explore their relationship with selected variables, and evaluate the basic psychometric properties of the tool.

## Methods

### Design

A quantitative cross-sectional study design was applied.

### Sample

The study included 255 registered Slovak nurses working in clinical practice who had begun their specialized studies at the Slovak Medical University in Bratislava. Before data collection, the study objectives were explained to all participants, informed consent was obtained, and the research was approved by the Ethics Committee for Biomedical Research of the Slovak Medical University in Bratislava.

### Data collection

Data were collected via a questionnaire (administered using a paper-and-pencil method with the personal participation of the study authors) between January and September 2024. The questionnaire included the Slovak version of the HLKES-2 tool, demographic items (gender, age, level of education, years of professional experience, unit type, and current work position), previous education in health literacy, and an interest item. We obtained the author's permission to use the tool, linguistically

validated into Slovak by Wild et al. (2005). The validation process included translation of the original English version into Slovak by two independent translators, followed by a back-translation into English conducted by another pair of independent translators. The back-translated version was compared with the original to ensure linguistic and conceptual equivalence. The HLKES-2 comprises ten knowledge items with multiple-choice answers and four experience items rated on a four-point Likert scale. The knowledge score was calculated by summing responses to ten items (0 = incorrect, 1 = correct), resulting in a total score ranging from 0 to 10, with higher scores indicating greater health literacy knowledge. The experience score was derived by summing responses to four items on a 4-point Likert scale (0 = never, 1 = sometimes, 2 = often, 3 = always), yielding a total score from 0 to 12, where higher scores reflect greater experience with health literacy.

To assess content validity, six experts in health literacy were consulted – three held a PhD, and four had published research on health literacy. Each expert rated the relevance of survey items on a 4-point Likert scale (1 = not relevant, 2 = somewhat relevant, 3 = quite relevant, 4 = highly relevant). Ratings were dichotomized into relevant (3–4) and not relevant (1–2) categories to calculate both item-level and overall content validity indices. The Content Validity Index (CVI) for each item was determined as the proportion of experts rating the item as relevant (Rubio et al., 2003). The overall scale content validity index (CVI) was calculated by averaging item-level CVIs, resulting in a value of 0.79, which is considered acceptable (Polit & Beck, 2006).

### Data analysis

The data were processed using SPSS version 21.0 with the application of descriptive and inferential statistical methods (Mann-Whitney U test and Spearman's correlation coefficient). The psychometric properties of the instrument were evaluated using Cronbach's alpha, and item difficulty and discrimination indices were also analyzed. Statistical significance was set at  $p \leq 0.05$ .

## Results

Of the 255 Slovak nurses in the sample, 243 (95.29%) were women, and 12 (4.71%) were men. The average age of the nurses was  $36.06 \pm 9.51$  years (range: 22–61 years), and the average length of professional work experience was  $12.43 \pm 9.14$  years (range: 0.5–39 years). Regarding educational

background, 60 nurses (23.53%) had a high school education, while 195 (76.47%) held a university degree. In terms of workplace, 110 nurses (43.14%) worked in intensive care units, and 145 (56.86%) worked in general units (internal medicine, surgery, and other disciplines). A total of 249 nurses (97.64%) provided direct nursing care, while six

nurses (2.36%) served as nurse managers. Regarding prior health literacy education, 140 nurses (54.9%) reported having received instruction on health literacy during their nursing studies, and 211 nurses (82.7%) expressed interest in further education on the topic (Table 1).

**Table 1** Sample characteristics (N = 255)

Variable	N (%)
<b>Gender</b>	
women	243 (95.29)
man	12 (4.71)
<b>Age</b>	
22–30 years	98 (38.43)
31–40 years	65 (25.49)
41–50 years	77 (30.20)
51 years and more	15 (5.88)
	<b>M ± SD (range) 36.06 ± 9.51 (22–61)</b>
<b>Level of education</b>	
secondary vocational education	42 (16.47)
higher education	18 (7.06)
bachelor degree	110 (43.14)
master's degree	85 (33.33)
<b>Professional work experience (in years)</b>	
1–5 years	73 (28.63)
6–10 years	64 (25.10)
11 years and more	118 (46.27)
	<b>M ± SD (range) 12.43 ± 9.14 (0.5–39)</b>
<b>Current work position</b>	
staff nurse	249 (97.64)
nurse manager	6 (2.36)
<b>Unit type</b>	
internal disciplines	58 (22.74)
surgery disciplines	66 (25.88)
intensive care units	110 (43.14)
others	21 (8.24)
<b>Previous education in Health Literacy</b>	
yes	140 (54.9)
no	115 (45.1)
<b>Interest in further education in Health Literacy</b>	
yes	211 (82.75)
no	44 (17.25)

M – Mean; SD – Standard deviation

### Results of the Slovak version of the HLKES-2 knowledge scale

In the knowledge scale, the nurses achieved a low average score of  $4.43 \pm 1.73$  points, which corresponds to 39.65% correct answers. The percentage of correct answers for individual knowledge items varied from 11.76% (Q2) to 58.43% (Q7). Only four out of the ten questions had a success rate higher than 50% (Table 2). Statistical analysis revealed no significant associations between the total knowledge score and nurses' education, type of workplace, or prior health literacy education.

Spearman's correlation indicated significant negative correlations between nurses' health literacy knowledge and both age and years of experience (Table 3).

### Results of the Slovak version of the HLKES-2 experience scale

In the experience scale, the nurses achieved an average score of  $5.05 \pm 2.58$  (range: 0–12). The highest score was recorded for item 4 (Q4: Using written materials when providing information to patients), and the lowest score for item 2 (Q2: Cultural appropriateness of healthcare materials)

(Table 4). Statistical analysis did not reveal significant relationships between the scores on the experiential scale and nurses' education or their previous education in the field of health literacy. A statistically significant relationship was found between nurses' experience with health

literacy and their work in general units. We also identified a weak but statistically significant positive correlation between nurses' health literacy experience and their years of professional practice. In contrast, no statistically significant relationship was observed between nurses' health literacy experience and their age (Table 5).

**Table 2** Results of the Slovak version of the HLKES-2 knowledge scale

Knowledge Scale (N = 255)	Correct answer	Incorrect answer
	N (%)	N (%)
<b>Q1: Occurrence of low health literacy in different age groups</b>	131 (51.37)	124 (48.63)
<b>Q2: Factors influencing patient education</b>	30 (11.76)	225 (88.24)
<b>Q3: Likelihood of contact with a patient with low health literacy</b>	59 (23.13)	196 (76.87)
<b>Q4: Health behavior of patients with low health literacy</b>	88 (34.51)	167 (65.49)
<b>Q5: Patients with limited health literacy skills vs. patients with adequate health literacy skills</b>	132 (51.76)	123 (48.24)
<b>Q6: Care plan for a patient with low health literacy</b>	99 (38.82)	156 (61.18)
<b>Q7: Priority in patient education</b>	149 (58.43)	106 (41.57)
<b>Q8: Method of assessing the effectiveness of education</b>	115 (45.10)	139 (54.9)
<b>Q9: Priority of initial education</b>	66 (25.88)	189 (74.12)
<b>Q10: Estimation of reading skills</b>	142 (55.69)	133 (44.31)

**Table 3** Relationship of knowledge to variables

Variable	Test	Value	p-value
<b>Level of education</b>	U	1.88451	0.0601 (NS)
<b>Type of workplace</b>	U	1.01659	0.308 (NS)
<b>Previous education in health literacy</b>	U	0.03157	0.976 (NS)
<b>Age</b>	$r_s$	-0.184	0.00319
<b>Years of experience</b>	$r_s$	-0.216	0.00052

NS – not significant; U – Mann-Whitney U test;  $r_s$  – Spearman's correlation

#### Reliability of the Slovak version of the HLKES-2

The Cronbach's alpha coefficient for the ten-item knowledge scale of the Slovak version of the HLKES-2 was low (Cronbach's  $\alpha = 0.446$ ). In contrast, the Slovak version of the HLKES-2 experience scale, which consists of four experience items, demonstrated good reliability (Cronbach's  $\alpha = 0.792$ ).

#### Item difficulty and discrimination indices

The difficulty index ranges from 0 to 1, reflecting the proportion of respondents who answer each item correctly. Values above 0.70 indicate that an item may be too easy, whereas values below 0.30 suggest it may be too difficult. For the knowledge items, difficulty indices ranged from 0.12 to 0.58. Seven items (Q1, Q4–Q8, Q10) fell within the optimal range (0.30–0.70), while three items (Q2, Q3, Q9) had indices below 0.30, indicating they were challenging for most respondents. The discrimination index measures an item's ability to differentiate between respondents with high and low overall

performance. Higher values indicate better differentiation between groups. A value above 0.30 is considered good to excellent, while values below 0.20 are considered poor and may not effectively distinguish between respondents. The discrimination indices ranged from 0.130 to 0.594. Seven items (Q1, Q4–Q8, Q10) demonstrated good discrimination ( $\geq 0.333$ ), indicating that they effectively differentiate respondents with varying levels of knowledge. In contrast, three items (Q2, Q3, Q9) had lower discrimination indices ( $< 0.22$ ), suggesting they were less effective at distinguishing between high- and low-performing respondents. The four experience items of the HLKES-2 had difficulty indices ranging from 0.29 to 0.40, indicating that they were of moderate to high difficulty. Furthermore, all items had very high discrimination index values (ranging 0.768–0.855), indicating excellent differentiation between respondents.

**Table 4** Results of the Slovak version of the HLKES-2 experience scale

Experience Scale (N = 255)	Never N (%)	Sometimes N (%)	Frequently N (%)	Always N (%)
<b>Q1: To evaluate the reading level of written healthcare materials.</b>	44 (17.25)	130 (50.98)	60 (23.53)	21 (8.24)
<b>Q2: To evaluate the cultural appropriateness of healthcare materials.</b>	59 (23.14)	123 (48.24)	58 (22.75)	15 (5.88)
<b>Q3: To evaluate the use of illustrations in written healthcare materials.</b>	36 (14.12)	121 (47.45)	74 (29.02)	24 (9.41)
<b>Q4: To use written materials to provide healthcare information.</b>	27 (10.59)	126 (49.41)	81 (31.76)	21 (8.24)

**Table 5** Relationship of experience to variables

Variable	Test	Value	p-value
Level of education	U	0.07806	0.93624 (NS)
Previous education in health literacy	U	-0.10153	0.92034 (NS)
Type of workplace	U	2.3709	0.01778
Years of experience	$r_s$	0.16041	0.0103
Age	$r_s$	0.10079	0.10836 (NS)

NS – not significant; U – Mann-Whitney U test;  $r_s$  – Spearman's correlation

## Discussion

To date, there have been no studies in Slovakia examining nurses' knowledge and experience concerning health literacy. This research represents the first study involving a sample of registered nurses in Slovakia using the Slovak version of the HLKES-2 tool.

In this study, nurses scored low on health literacy knowledge (39.65%), which aligns with findings from other countries such as Greece (Angelopoulou et al., 2023), Nepal (Subedi et al., 2022), and Iraq (Al-Fayyadh et al., 2022), where nurses achieved similarly low scores. In addition, previous research has indicated that nurses often possess inadequate knowledge of health literacy, have limited practical experience in applying health literacy support (Nesari et al., 2019), and may not fully understand the concept of health literacy (Perrin et al., 2022). Additionally, research points to insufficient integration of health literacy education within clinical practice (Nantsupawat et al., 2020). The low knowledge scores observed in our study may also reflect findings from a recent survey indicating that nursing programs at Slovak universities do not adequately emphasize health literacy (Čakloš et al., 2024). On a positive note, 211 nurses (82.75%) in our study expressed interest in learning more about health literacy.

We found no correlation between nurses' knowledge scores and their education level, workplace type, or prior health literacy education, which is consistent with the findings of Angelopoulou et al. (2023). Chang et al. (2020) identified education level, work

position, years of experience, and participation in continuing education as predictors of health literacy knowledge. In our study, older nurses and those with more professional experience scored lower in health literacy knowledge. These results highlight the importance of ongoing nursing education to improve understanding and practical application of health literacy in patient communication and education.

In contrast, nurses scored higher on the experience scale, consistent with studies from Greece (Angelopoulou et al., 2023) and Iraq (Al-Fayyadh et al., 2022). Our results show that many responses on the experience scale fell into the "sometimes" category, which may suggest that these activities are not routinely practiced by nurses. This could negatively impact effective communication between nurses and patients. No significant correlations were found between nurses' experience scores and their educational background or previous health literacy training. In contrast, a statistically significant positive association was identified with workplace type: nurses in standard care units achieved higher experience scores than those in intensive care units, likely due to variations in care practices and patient populations between these settings. Angelopoulou et al. (2023) found that experience scores were significantly associated with age and years of nursing practice. Similarly, our results showed a positive correlation with years of professional experience and nurses' health literacy experience, although age was not statistically significant. With increasing years of practice, nurses may gain practical communication skills naturally

in the clinical environment; Al-Fayyadh et al. (2022) note that nurses tend to base their actions more on experience than on formal health literacy knowledge. Nevertheless, they stress the importance of continuous education to update nurses' knowledge and improve practical skills in this area.

Kaper et al. (2018) confirmed that health literacy training improves healthcare professionals' communication skills. Educating nurses in health literacy is essential for several reasons. It enables them to independently apply communication skills and strategies to support health literacy, integrating professional knowledge with practical skills when providing care to individuals and communities.

Reliability analysis of the Slovak HLKES-2 showed differing results between the knowledge and experience scales. Cronbach's alpha for the ten-item knowledge scale was 0.446, suggesting low internal consistency. This is likely influenced by the small number of items and the presence of multiple correct answers, as reported in prior research (Walker et al., 2019:  $\alpha = 0.51$ ; Angelopoulou et al., 2023:  $\alpha = 0.56$ ). Despite being below the conventional cutoff, reliability may be deemed acceptable considering the scale's limited length and multiple-choice design.

### Limitation of study

The Slovak adaptation of the HLKES-2 provides the first substantive insights into Slovak nurses' knowledge and experience with health literacy, addressing a research gap, since no previous studies on this topic have been conducted in Slovakia. These findings may be useful for further research, for revising the measurement tool based on its psychometric properties, or for employing alternative instruments to assess nurses' knowledge and experience with health literacy.

### Conclusion

This study provides important insights into nurses' knowledge and practical experience regarding health literacy. Our findings reveal a noteworthy contrast: while nurses demonstrated relatively low theoretical knowledge of health literacy concepts, they reported a higher level of practical experience in applying these concepts in daily nursing care. This discrepancy underscores the urgent need for targeted and continuous education programs to strengthen nurses' knowledge and ensure that evidence-based health literacy strategies are consistently applied. The results also show that the majority of Slovak nurses expressed a strong

interest in further education related to health literacy. This indicates both a readiness and potential for enhancing health literacy practices within Slovak nursing. By supporting and improving nurses' knowledge in this area, educational institutions and professional development programs can play a key role in improving patient communication, promoting health education for patients and their families, and ultimately ensuring high-quality, patient-centered nursing care. In conclusion, prioritizing the development of nurses' health literacy knowledge is essential not only to enhance theoretical understanding but also to improve practical application, strengthen patient education, and promote better health outcomes across communities.

### Ethical aspects and conflict of interest

Nurses participated voluntarily and provided informed consent after being assured of anonymity, the credibility of the research, and their right to withdraw at any time. The study adhered to the Declaration of Helsinki, and approval was granted by the Ethics Committee for Biomedical Research of the Slovak Medical University in Bratislava (No. EKBV 22/2024). The authors declare no potential conflicts of interest.

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### Author contributions

Conception and design (MS, MČ, GP), data analysis and interpretation (EM, MČ), manuscript draft (MS, MČ), critical revision of the manuscript (ZB, MČ, JK), final approval of the manuscript (MS, MČ, JK).

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