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Standardized Medical Terminology: Awareness and Application Among Members of the Korean Society for Laboratory Medicine

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Dear Editor,

Interoperability, categorized into foundational, structural, semantic, and organizational levels, optimizes data exchange and integration [1]. Semantic interoperability is essential for accurately interpreting clinical data. Standardized terminologies such as Logical Observation Identifiers Names and Codes (LOINC), Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT), Unified Code for Units of Measure (UCUM), and unique device identifiers (UDIs) help maintain data consistency and facilitate clear communication among healthcare systems [2].

LOINC and SNOMED CT are widely used for standardizing laboratory observations and clinical documentation, respectively, thus facilitating interoperability [3, 4]. UCUM standardizes measurement units, ensuring accuracy in numerical data exchange in clinical and laboratory settings [5]. UDIs support device traceability and patient safety. These terminologies are crucial for minimizing errors, enhancing care quality, and supporting data-driven healthcare [6]. Electronic medical record (EMR) certification criteria further emphasize their role in ensuring interoperability and data accuracy, highlighting their importance in advancing medical research and clinical practice [6].

We assessed the current levels of awareness and adoption of standardized medical terminology and its mapping among members of the Korean Society for Laboratory Medicine (KSLM), aiming to support foundational efforts toward healthcare data standardization. Data were collected via an anonymous online questionnaire distributed via email to KSLM members. The survey was conducted from June 12 to 30, 2023. The survey design

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and participant details have been described elsewhere [7].

The questionnaire included four sections addressing (1) the awareness of terminology standards, (2) the need for terminology standard implementation, (3) EMR system certification, and (4) participation in LOINC adoption research. The study was approved by the Institutional Review Board of Hallym University Dongtan Sacred Heart Hospital (approval No.: 2023-03-005). Among 1,017 invited participants, 182 (17.9%) completed the survey.

Regarding the knowledge of terminology standards (multiple responses allowed), Medical Subject Headings was the most widely recognized, with 75.8% of respondents being familiar with it, whereas Current Procedural Terminology was less familiar, recognized by only 18.1% of respondents. The awareness rates of LOINC (52.2%) and SNOMED CT (25.8%) were relatively low despite their importance in laboratory medicine (Fig. 1).

Most respondents (98.9%) supported the introduction of terminology standards for electronic health information exchange (HIE). The primary reasons were the facilitation of clinical data exchange among hospitals (71.7%), improved data pooling and analytics (19.4%), reduction of duplicate testing (8.3%), and support for collaborative research (3.3%).

The Korea Health Information Service is currently implementing an EMR system certification initiative aimed at enhancing health data exchange and improving the quality of healthcare services [8]. However, 69.8% of the respondents were unaware of this initiative. Moreover, 103 respondents (56.6%) expressed their willingness to participate in research related to terminology standardization, such as LOINC, in laboratory medicine, whereas 79 respondents (43.4%) indicated that they were unwilling to participate in the study.

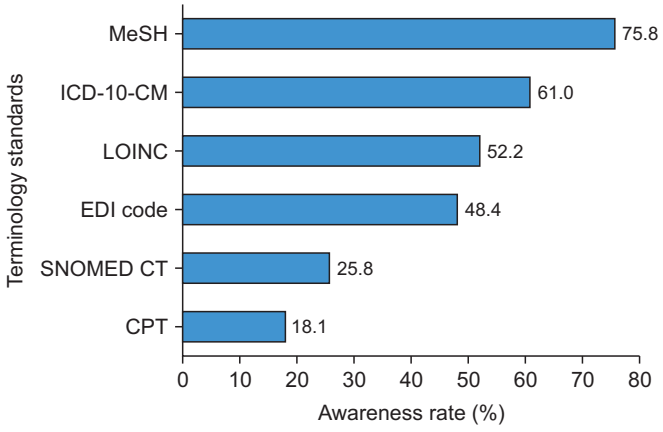

Fig. 1. Awareness of terminology standards among members of the Korean Society for Laboratory Medicine.
Abbreviations: CPT, Current Procedural Terminology; EDI, Electronic Data Interchange; ICD-10-CM, International Classification of Diseases-10-Clinical Modification; LOINC, Logical Observation Identifier Names and Codes; MeSH, Medical Subject Headings; SNOMED CT, Systematized Nomenclature of Medicine Clinical Term.

Acknowledging the increasing need for interoperability, the Korean Ministry of Health and Welfare launched the MyHealthway project and its mobile application in 2021 to integrate personal health records and improve digital data accessibility [9]. Despite the recognized necessity for terminology standardization, limited awareness of standards such as LOINC and SNOMED CT, as well as the EMR certification system, poses challenges in achieving interoperability. This limited awareness may be attributed to the limited coverage of terminology standards in formal education, insufficient adoption at the institutional level, and lack of emphasis on their application in routine laboratory practice. Even with LOINC adoption, considerable inconsistencies remain; one study reported a mapping discrepancy rate >15% across hospitals in Korea, highlighting the need for expert validation [10]. Addressing these challenges requires increased awareness and structured educational programs. Such programs should target laboratory professionals, clinical informatics personnel, and EMR vendors and should include practical training on terminology systems, mapping methods, and implementation-use cases. To promote compliance, government-led incentives or mandatory inclusion of standardized terminologies in EMR certification criteria should be considered.

This study had some limitations. The relatively small sample size may not fully represent laboratory medicine perspectives. Individuals with a strong interest in terminology standardization may have been more likely to participate; this may have caused responder bias.

In conclusion, although there is strong support for terminology standardization in electronic HIE, targeted educational efforts are needed to improve awareness and ensure successful implementation. Professional organizations, such as the KSLM, must take the lead in bridging the gap by developing practical toolkits, offering certified training programs, and facilitating interdisciplinary collaboration. Ongoing longitudinal studies will be necessary to regularly monitor changes in the awareness of terminology standardization, actual adoption rates, and mapping accuracy, and evaluate the impact of related policies.

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AUTHOR CONTRIBUTIONS

Yu S and Cho EJ contributed to the conception and design of the study. Yu S, Jeon BR, Liu C, Kim D, Park HI, Park HD, Shin JH, Lee JH, Choi Q, Kim S, Yun YM, and Cho EJ were involved in the study methodology. Yu S, Jeon BR, Liu C, Kim D, Park HI, Park HD, Shin JH, Lee JH, Choi Q, Kim S, Yun YM, and Cho EJ contributed to the investigations. Shin JH and Kim S acquired funding for the study. Yu S, Park HD, Kim S, Yun YM, and Cho EJ were involved in project administration. Shin JH, Kim S, Yun YM, and Cho EJ supervised the study. Yu S and Cho EJ drafted, reviewed, and edited the manuscript. All authors have read and approved the final manuscript.

CONFLICTS OF INTEREST

None declared.

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