

Defining and measuring educational competence of hospital-based registered dietitians in Japan: development and validation of a self-assessment scale

Chisako Kambara¹

¹PhD, Associate Professor Health Sciences Studies, Department of Regional Development, Faculty of Regional Development, Prefectural University of Hiroshima, Hiroshima, Japan

Abstract

Background: Educational competence is critical for registered dietitians responsible for mentoring junior colleagues in hospitals. However, no standardized assessment method has been available in Japan. This study aimed to define the components of registered dietitian educational competence and to develop and validate a self-assessment scale for its measurement. **Methods:** A cross-sectional study approved by the institutional ethical board was conducted from July to August 2022 among hospital-based registered dietitians in Japan working in facilities with ≥ 200 beds and experience mentoring junior colleagues or subordinates. Self-administered questionnaires were collected from 1,215 participants (response rate: 67.2%). **Results:** Exploratory and confirmatory factor analyses resulted in a final scale comprising 29 items across five factors:

personality characteristics, teaching skills, interpersonal skills, knowledge and expertise, and educational involvement. The overall Cronbach's alpha coefficient was 0.92, indicating high reliability. Validity was supported by fit indices (standardized root mean square residual = 0.05, root mean square error of approximation = 0.06, and comparative fit index = 0.90). **Discussion:** This study defined the components of registered dietitian educational competence and developed a reliable, valid self-assessment tool. The scale may support professional development, strengthen training programs for registered dietitians, and serve as a model for educational competency frameworks in other healthcare professions.

Keywords: dietitian, hospital, education, competence, self-assessment scale, reliability, validity

Date submitted: 21-August-2025

Email: Elizabeth Oommen (beth.oommen@calvin.edu)

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

BACKGROUND

Registered dietitians (RDs) in Japan are licensed by the Minister of Health, Labour and Welfare and are responsible for nutrition and food service management aimed at promoting health and preventing disease.¹ They work across a variety of settings, including hospitals, schools, and community organizations. In hospitals, the scope of RD practice has expanded in response to evolving disease patterns and demographic changes, becoming increasingly complex and sophisticated each year. Similar to the findings of international reports on occupational stress among dietitians,²⁻³ occupational stress is also a recognized concern among RDs in Japan.⁴⁻⁶ Hospital-based RDs face challenges such as limited opportunities for professional development and insufficient clinical training systems. For example, the preceptor system

Citation: Kambara C. Enhancing interprofessional competence among Speech Pathology, Nursing, Social Work, and Psychology students using simulated case presentations. *Educ Health* 2026;39:28-26

Online access: www.educationforhealthjournal.org

DOI: 10.62694/efh.2026.473

Published by The Network: Towards Unity for Health

is widely applied in Japan for the training of newly graduated nurses, with guidelines established by the Ministry of Health, Labour and Welfare to support the professional development of new nursing staff.⁷ These systems rely on experienced nurses serving as educators and mentors, supported by explicit competency requirements and evaluation criteria.⁸⁻⁹

However, for RDs, the adoption of preceptor systems or clinical ladder frameworks remains limited to certain hospitals, and no standardized approach exists for assessing and developing educational competence. Moreover, the specific components of educational competence for RDs have not been clearly defined. This gap in professional development may impede individual career advancement and compromise the overall quality of patient care. It is also important to note

that educational competence in this context differs from academic teaching at universities or general workplace training. For hospital-based RDs, it refers to the ability to guide junior colleagues and subordinates through direct clinical supervision, knowledge transfer, interpersonal coaching, and professional role modeling. This competence encompasses technical expertise, teaching skills, attitudes, and motivation toward education. Therefore, the educational competence of hospital-based RDs is characterized by their ability to mentor junior colleagues and subordinates while conducting educational activities in clinical settings. To better define and strengthen this critical role within the healthcare team, a reliable and valid assessment tool is needed to evaluate, train, and support the educational competence of hospital-based RDs.

To address the lack of conceptual clarity surrounding educational competence among hospital-based RDs, this study adopts a conceptual framework integrating the following three related domains: educational, instructional, and professional competence. This framework is based on findings from previous studies.¹⁰⁻¹¹ Educational competence is distinguished from two related concepts: firstly, instructional competence denotes the ability to provide systematic instruction, feedback, and skill demonstrations within routine clinical practice. This concept reflects the workplace mentoring theory, including guided participation and experiential learning, and encompasses the teaching techniques necessary for effective clinical mentoring. Secondly, professional competence pertains to the clinical knowledge, judgment, and domain-specific expertise required for mentoring others. Conventional competency models in healthcare highlight the significance of clinical educators for establishing a solid professional foundation before engaging in mentoring. Educational competence integrates both instructional and professional competence, combining them with interpersonal elements that facilitate sustained engagement in educational activities. This theoretical association, which is reflected in the item development, factor interpretation, and hierarchical model of this study, is elucidated in Figure 1.

Previous research proposed a preliminary scale to measure this competence but was limited by a small sample size.¹⁰ Based on these findings, this study aimed to (1) define the components of educational competence among RDs working in Japanese

hospitals; and (2) develop and validate a self-assessment scale to support professional competency development and the establishment of hospital-based training systems. To achieve this, we expanded the sample size and conducted a survey using the previously developed scale. The scale is expected to support the professional development of RDs by helping hospitals establish educational support systems, facilitating RD-led talent development, and promoting self-assessment. This study addresses a critical gap by defining the components of educational competence for RDs and providing a validated tool to support their development as clinical educators.

METHODS

Research design and participants: This cross-sectional study examined the educational performance of RDs employed in Japanese hospitals. The target population was defined as all active RDs working in hospitals in Japan who engage in educating or supervising junior colleagues. Subsequently, the accessible population (sampling frame) was established by identifying hospitals with ≥ 200 beds that were listed on the Japan Hospital Association (JHA) website. The JHA is representative of most hospitals nationwide. Hospitals with ≥ 200 beds were selected as they typically employ multiple RDs, thereby increasing the possibility of including those with mentoring responsibilities.

Within these hospitals, all RDs who met the inclusion criteria were contacted. The following were the two inclusion criteria: (1) currently employed as an RD; and (2) with an experience of mentoring junior colleagues or subordinates, regardless of years of work experience. These criteria were selected on the basis of the assumption that mentoring responsibilities differ by role rather than years of experience; therefore, no minimum experience requirement was imposed. The exclusion criteria encompassed non-RDs, healthcare professionals other than RDs, and RDs without mentoring experience.

Survey requests were sent to nutrition department heads at 1,102 hospitals across 40 prefectures outside the Chugoku and Shikoku regions, where the preliminary survey had been conducted. These hospitals represented the entire sampling frame. Hospitals that agreed to participate ($n = 435$) were distributed across all prefectures. Based on departmental rosters, 1,806 eligible RDs were identified within these participating hospitals, and

all participants received questionnaires. They voluntarily and anonymously completed a self-administered questionnaire assessing teaching competencies. Responses were returned by mail in a prepaid envelope. A total of 1,215 RDs responded, yielding a 67.2% response rate. The survey was conducted from July to August 2022. The research protocol was approved by the Research Ethics Committee of the Prefectural University of Hiroshima (approval number: 20HH006).

Instrument development: To further refine the draft scale developed in prior study,¹⁰ the preliminary survey required respondents to evaluate item clarity and identify content that might produce unintended effects. In the previous study,¹⁰ initial items were generated through a literature review and interviews with 25 hospital-based RDs, followed by a content validity assessment by 10 experts and a survey of 80 participants. For the preliminary survey, 222 respondents rated item clarity. Based on this feedback, items were revised, and a 29-item questionnaire was finalized. Responses were recorded on a four-point Likert scale. Additionally, participant demographics (e.g., age and sex) and facility characteristics (e.g., functional classification and number of licensed beds) were collected using a structured format. The number of junior colleagues and subordinates, and the number of RDs were recorded using a numerical entry format.

Statistical analysis: The Shapiro–Wilk test was used to confirm the normality of items to which participants provided numerical responses. Item analysis, exploratory factor analysis, and confirmatory factor analysis (CFA) were conducted. Reliability was assessed using Cronbach’s alpha ($\alpha \geq 0.7$ considered acceptable).¹² The fit of the CFA model was evaluated using the following acceptable values: standardized root mean square residual (SRMR < 0.08), root mean square error of approximation (RMSEA < 0.08), and comparative fit index (CFI > 0.90)¹³. Correlations between factors and hierarchical model testing were also conducted. Statistical analyses were performed using IBM SPSS Statistics 28 and IBM SPSS Amos 27 (IBM Japan, Ltd.), and p-values < 0.05 were used to denote statistical significance (two-tailed).

RESULTS

Participants’ characteristics: Table 1 summarizes the characteristics of the participants. Of the 1,215 respondents (response rate: 67.2%), 1,068 (87.9%) were female, and 426 (35.1%) were aged 30–39

years. The median length of service was 13 years, and nearly half held managerial positions. Most participants were employed in acute-care hospitals with 400–499 beds.

Item analysis: Analysis of the items revealed no ceiling or floor effects, and none were excluded based on SD criteria, G-P analysis, I-T or I-I correlation.

Factor structure: After confirming eigenvalues, the contribution ratio, and scree plot, five factors were assumed. Using the maximum likelihood method and promax rotation, a five-factor structure with 29 items was obtained. All items had loadings of >0.35. Significant positive correlations ($r = 0.39$ – 0.52) were observed among all factors. Factor I, “Personality characteristics,” comprised seven items covering traits such as assertiveness and cooperativeness. Factor II, “Teaching skills,” included 10 items addressing teaching ability, interpersonal skills, and teaching responsibilities. Factor III, “Knowledge and expertise,” comprised six items related to knowledge, expertise, and teaching ability. Factor IV, “Interpersonal skills,” consisted of three items. Factor V, “Educational involvement,” included three items on teaching ability, knowledge and expertise for junior colleague and subordinates. Table 2 summarizes the five factors and their corresponding items.

Reliability and validity: Cronbach’s alpha coefficients for each of the five factors were as follows: 0.89 for Factor I, 0.85 for Factor II, 0.81 for Factor III, 0.72 for Factor IV, and 0.73 for Factor V. Cronbach’s alpha coefficient for the overall scale was 0.92. CFA revealed SRMR = 0.05, RMSEA = 0.06, and CFI = 0.90. Assuming a secondary factor named “instructional competence” and “professional competence” between educational competence and the primary, educational competence exhibited significant path coefficients for personality characteristics, and instructional competence and professional competence were 0.65, 0.84, and 0.95, respectively (Figure 1).

The goodness-of-fit of the model with the four variables of educational competence, personality characteristics, and instructional competence and professional competence was SRMR = 0.05, RMSEA = 0.06, and CFI = 0.90.

DISCUSSION

This study is the first to comprehensively define and measure the educational competence of hospital-based RDs in Japan. The resulting five-factor model

Table 1: Participants' characteristics; N = 1215

	Category	n (%)
Personal attributes		
Age (years)	<30	247 (20.3)
	30–39	426 (35.1)
	40–49	289 (23.8)
	>50	253 (20.8)
Sex	Male	147 (12.1)
	Female	1068 (87.9)
Job Position	Department manager	596 (49.1)
	Department middle manager	357 (29.4)
	No title or position	262 (21.6)
Duration worked (years)		Median (IQR): 13.0 (7.0–23.0)
Number of junior colleague and subordinates you have had (people)		Median (IQR): 8.0 (4.0–15.0)
Overview of the facility		
Function classification	Acute-phase	1026 (84.4)
	Convalescent-phase	31 (2.6)
	Chronic-phase	52 (4.3)
	Other	106 (8.7)
Number of licensed beds	200–299	261 (21.5)
	300–399	254 (20.9)
	400–499	285 (23.5)
	500–599	157 (12.9)
	600–699	88 (7.2)
	>700	170 (14.0)
Average age of patients	50s	116 (9.5)
	60s	276 (22.7)
	70s	576 (47.4)
	80s	130 (10.7)
	Other	57 (4.7)
	Unanswered	60 (4.9)
Number of registered dietitians	Full-time work	Median (IQR): 6.0 (4.0–8.0)
	Part-time work	Median (IQR): 0.0 (0.0–1.0)

Items answered by entering numerical values did not show normality using the Shapiro–Wilk test. The other bed function categories included acute and convalescent; acute and chronic; and acute, convalescent, and chronic. Other patient age categories were unknown, 10s, 20s, 30s, 40s, and 90s.

Figure 1: Conceptual framework for the educational competence of registered dietitians
Educational competence integrates instructional and professional competence, combining them with personality characteristics.

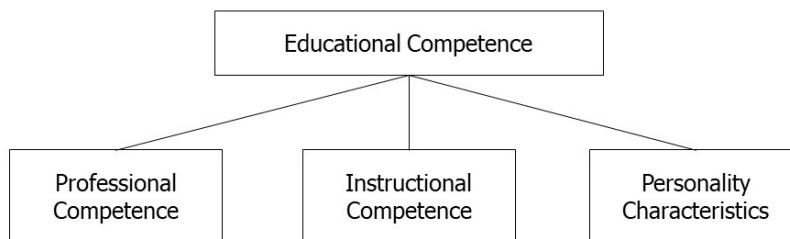
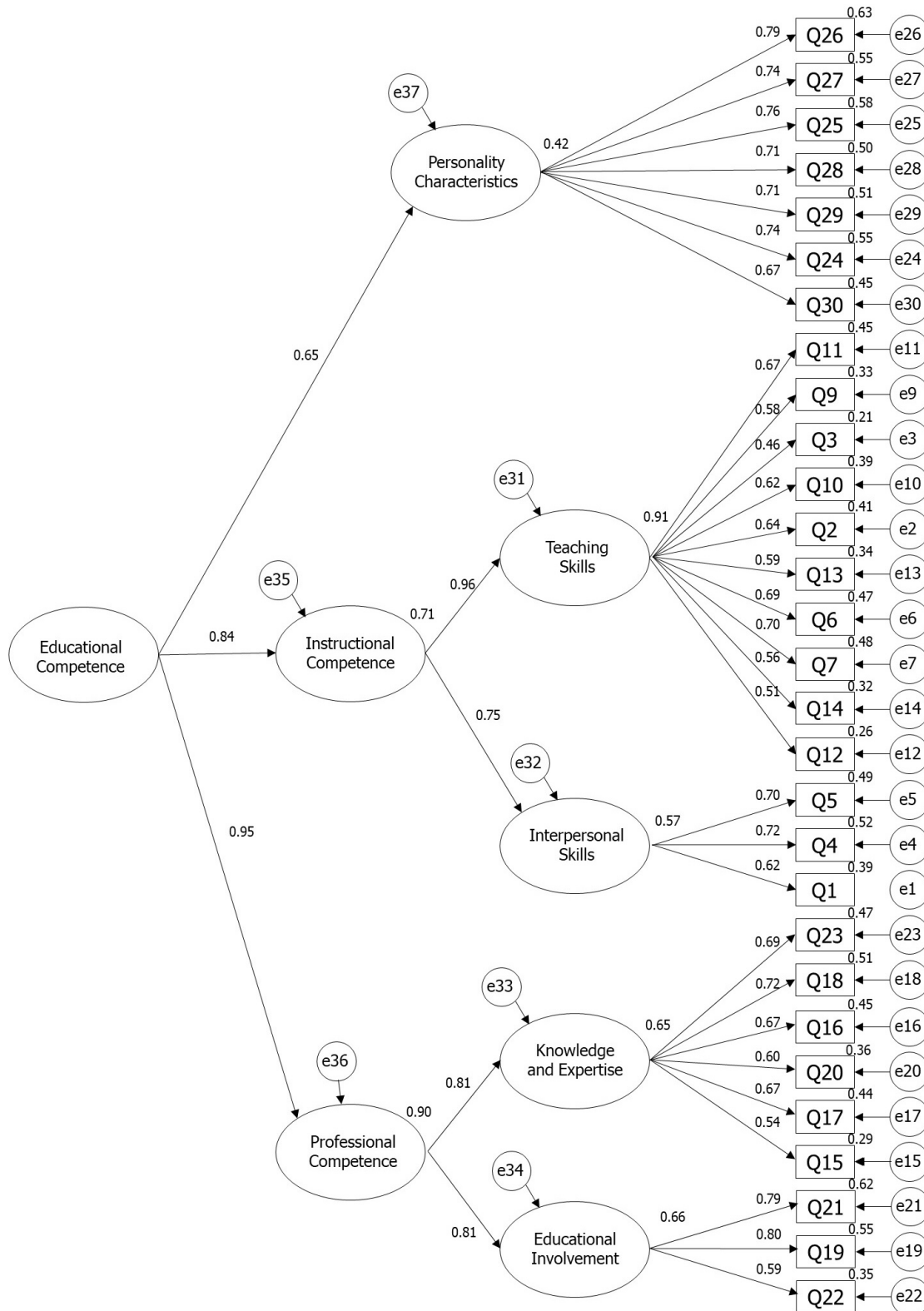


Table 2: Five factors constituting educational competence and their corresponding items

	Question items
Factor I: Personality characteristics (7 items)	
Q26	I have a cheerful personality.
Q27	I have a sense of humor.
Q25	I am a mood maker in the department.
Q28	I am easily approachable by everyone.
Q29	I am open to talking with individuals I have never met before.
Q24	I have good communication skills.
Q30	I have several acquaintances and value my connections.
Factor II: Teaching skills (10 items)	
Q11	I can judge when it is appropriate to provide advice to my junior colleagues/subordinates.
Q9	I foster an environment where junior colleague/subordinates do not fear failure or mistakes.
Q3	I am patient with junior colleagues/subordinates without getting emotional when instructing them.
Q10	I judge whether to provide gentle or strict guidance to my junior colleagues/subordinates.
Q2	I provide guidance that is appropriate to the level of my junior colleagues/subordinates.
Q13	I know how to relate to my junior colleagues/subordinates.
Q6	I handle incidents involving junior colleagues/subordinates well.
Q7	I respect the privacy rights and personal lives of others.
Q14	In teaching junior colleagues/subordinates, I ensure that the teacher and the teacher learn from each other.
Q12	I can identify and assist my junior colleagues/subordinates with potential accidents/incidents before they happen.
Factor III: Knowledge and expertise (6 items)	
Q23	I constantly acquire the latest knowledge and skills through workshops, conferences, and professional journals.
Q18	I immediately apply the new knowledge and skills I have acquired through workshops, conferences, and professional journals to my daily work.
Q16	I explain and transfer new knowledge and skills I have acquired through workshops, conferences, and professional journals to junior colleagues/subordinates.
Q20	In my daily work, I use my clinical nutrition management experience and expertise.
Q17	I have adequate professional knowledge and skills in the field of clinical nutrition management.
Q15	I am proactive in everything I do.
Factor IV: Interpersonal skills (3 items)	
Q5	I can stay calm when handling multiple tasks simultaneously.
Q4	In my work, I can organize my thoughts and take immediate action.
Q1	I am systematic and efficient in my work.
Factor V: Educational involvement (3 items)	
Q21	I directly speak with my junior colleagues/subordinates about how to grow as a member of the society.
Q19	I directly speak with my junior colleagues/subordinates about how to grow as a registered dietitian.
Q22	I provide junior colleagues/subordinates with opportunities to think independently and learn on their own.

Figure 2: Path analysis of educational competence for registered dietitians
 The educational competence of registered dietitians working in Japanese hospitals consists of five factors, which can be classified into three concepts: personality characteristics, instructional competence, and professional competence. The SRMR was 0.05, the RMSEA was 0.06, and the CFI was 0.90. All paths were statistically significant ($p < 0.05$).



emphasizes the importance of technical expertise and personal qualities — such as enthusiasm, empathy, and approachability — for effective mentoring. Reliability was confirmed using Cronbach's alpha, indicating high internal consistency, while validity was supported by CFA, demonstrating construct validity. This scale is an effective tool for RDs to self-assess their educational competence. The study particularly examines the competence demonstrated by RDs in their roles as preceptors and mentors, which differs from university education that emphasizes academic performance and knowledge acquisition, and from workplace training that focuses on task-specific skills. The aim of this study is for RDs to self-assess their ability to effectively train and mentor junior colleagues in real clinical settings.

This scale displays a hierarchical model with educational competence as the foundation followed by instructional and professional competence. Strong path coefficients from educational competence to instructional and professional competence highlight that RDs must develop their own practical expertise and instructional abilities to effectively mentor others. Furthermore, the analysis of educational involvement and personality characteristics demonstrated that attitudes and instructor-like qualities are crucial elements of educational competence, suggesting that educational instructors require technical expertise as well as personal qualities like charm and passion.

The emphasis on personal qualities in educational instructors aligns with prior research on leadership abilities among nurses,¹⁴ midwives,¹¹ pharmacists,¹⁵ and dietitians,¹⁶ supporting the view that positive personality characteristics are essential for effective clinical education. A key contribution of this study is the identification of a new factor, “educational involvement,” which incorporates teaching motivation and active engagement into the evaluation framework. This factor enables assessment of educators' enthusiasm and motivation — aspects often underrepresented in conventional measures. This study identified factors reflecting attitudes and behaviors related to actively engaging in the education of junior colleagues and subordinates, recognizing them as important indicators of proactivity and independence in educational settings. These findings offer a new perspective for evaluating leaders' initiative and autonomy, with potential implications for enhancing organizational commitment.¹⁷ Although

certain items in the scale may overlap with general competence in nutrition, its primary focus is on the educational aspects of professional practice, such as mentoring, instruction, and active involvement in training junior colleagues, distinguishing it from broader evaluations of clinical expertise.

Considering the working conditions and occupational stress faced by RDs,⁴⁻⁶ utilizing this self-assessment scale has the potential to enhance RDs' practical skills, support their growth as educators, and improve professional satisfaction. Therefore, it can be effectively employed in human resource development and workplace training initiatives for RDs. This scale was designed specifically for hospital-based RDs and is not intended for use by other healthcare professionals. Future research may investigate its applicability to other nutrition-related roles or broader interdisciplinary settings.

Limitations

This study has several limitations. First, it relied solely on self-assessment, which may introduce subjective bias. Combining self-assessments with evaluations from supervisors or peers could improve objectivity. Second, the cross-sectional design precluded the assessment of changes in competence over time or causal relationships between competence and outcomes. Third, as the study focused on RDs working in large Japanese hospitals (≥ 200 beds), generalizability to smaller hospitals, other healthcare settings, or international contexts may be limited. In Japan, the limited number of foreign-trained RDs hinders cross-cultural interpretation. Finally, future studies should examine test-retest reliability and assess the scale's applicability across other healthcare professions and international contexts.

Conclusion

This study defined the educational competence of hospital-based RDs in Japan and developed and validated a self-assessment scale to evaluate it. The five-factor structure — personality characteristics, teaching skills, knowledge and expertise, interpersonal skills, and educational involvement — demonstrated strong reliability and validity. By clarifying the key components of educational competence, the scale can support professional development, enhance mentoring effectiveness, and ultimately improve patient care. Future studies should explore its broader applications.

References

1. The Japan Dietetic Association. Information regarding registered dietitians and dietitians in Japan. *dietitian.or.jp*. Retrieved September 12, 2025, from <https://www.dietitian.or.jp/english/dietitians/>.
2. Canazaro BC, Aguiar OB, Moreno AB, Alves MGM, Fonseca MJMD. Association between job stress and quality of life in nutritionists working in public hospitals in Rio de Janeiro, Brazil. *Cien Saude Colet*. 2022; 27(5):1951-1963. <https://doi.org/10.1590/1413-81232022275.11642021>
3. Alhaj OA, Elshahoryi NA, Fekih-Romdhane F, Wishah M, Sweidan DH, Husain W, Achraf A, Trabelsi K, Hebert JR, Jahrami H. Prevalence of emotional burnout among dietitians and nutritionists: a systematic review, meta-analysis, meta-regression, and a call for action. *BMC Psychology*. 2024; 12(1):775. <https://doi.org/10.1186/s40359-024-02290-8>
4. Yaginuma-Sakurai K, Saito C, Kasahara Y, Tsuno K, Yoshimasu K, Tatsuta N, Goto M, Nakai K. A cross-sectional study of the association between effort-reward imbalance and psychologic distress among Japanese dietitians. *Journal of Occupational Health*. 2021; 63:e12285. <https://doi.org/10.1186/s40359-024-02290-8>
5. Kusunoki A, Moriwaki S, Kambara C. Job satisfaction and work-life balance of RDs working at a medium-sized hospital. *Journal of the Japan Dietetic Association*. 2022; 65:211–218. [in Japanese]
6. Nakamura M, Kambara C. Job satisfaction and work-life balance of RDs and dietitians working in large-sized hospitals. *Journal of the Japan Dietetic Association*. 2024; 67:136-143. [in Japanese]
7. Ministry of Health, Labour and Welfare. Guidelines for training of new nursing colleague [revised version]. *mhlw.go*. Retrieved September 12, 2025, from https://www.mhlw.go.jp/file/06-Seisakujouhou-10800000-Iseikyoku/0000049466_1.pdf. [in Japanese]
8. Gong Z, Van Swol LM, Wang X. Study on the relationship between nurses' mentoring relationship and organizational commitment. *International Journal of Environmental Research and Public Health*. 2022; 19:13362. <https://doi.org/10.3390/ijerph192013362>
9. Lemetti T, Pakarinen A, Salminen L, Virtanen H, Haapa T. Instruments assessing nurse educator's competence: a scoping review. *Nursing Open*. 2023; 10:1985–2002. <https://doi.org/10.1002/nop2.1479>
10. Kambara C, Yamasaki Y. Evaluation scale for the mentoring competence of hospital-based registered dietitians: a pilot study. *Journal of the Japanese Association of Nutritional Science Education*. 2022;8:23–33. [in Japanese]
11. Hishinuma Y, Horiuchi S, Yanai H. Development and assessment of the validity and reliability of a scale for measuring the mentoring competencies of Japanese clinical midwives: an exploratory quantitative research study. *Nurse Education Today*. 2016; 41:60–66.
12. Terwee CB, Bot SD, de Boer MR, Van der Windt DA, Knol DL, Dekker J, Bouter LM, de Vet HC. Quality criteria were proposed for measurement properties of health status questionnaires. *Journal of Clinical Epidemiology*. 2007; 60:34–42. <https://doi.org/10.1016/j.jclinepi.2006.03.012>
13. Hu LT, Bentler PM. Cutoff criteria for fit indexes in the covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*. 1999; 6:1–55. <https://doi.org/10.1080/10705519909540118>
14. L'Ecuyer K, Subramaniam DS, Reansing C, DuBois JC. Psychometric testing of the preceptor self-assessment tool (PSAT)-40 for nursing preceptors. *Journal of Continuing Education in Nursing*. 2022; 53:491–499. <https://doi.org/10.3928/00220124-20221006-06>

15. Walter S, Mulherin K, Cox CD. A preceptor competency framework for pharmacists. Part 2 of a 3-part series. *Currents in Pharmacy Teaching and Learning*. 2018; 10:402–410. <https://doi.org/10.1016/j.cptl.2017.11.018>
16. Sarcona AR, Burrowes JD, Fornari AJ. Characteristics of an effective preceptor: dietetics education as a paradigm. *Allied Health*. 2015; 44:229–235. <https://pubmed.ncbi.nlm.nih.gov/26661703/>
17. Paparisabet M, Jalalpour AH, Farahi F, Gholami Z, Shaygani F, Jalili N, Beigi SR, Ahmadi Marzaleh M, Elyaderani HD. Investigating the organizational commitment and its associated factors among the colleague of the health sector: a cross-sectional research. *BMC Health Services Research*. 2024; 24(1):1373. <https://doi.org/10.1186/s12913-024-11893-1>