

## ORIGINAL

# Development of a staying power scale for nurses

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**Abstract:** Nurse retention is a major concern worldwide, as a shortage of experienced nurses can affect the quality and continuity of patient care; however, a reliable tool for evaluating it needs to be developed. This study aimed to develop a Staying Power Scale for Nurses (SPSN) and evaluate its reliability and validity. Following a pilot study, we developed a 35-item SPSN. SPSN reliability was measured using Cronbach's  $\alpha$ , and its validity was tested through exploratory and confirmatory factor analyses. Data from 802 nurses were analyzed (response rate, 38.8%; valid responses, 94.1%); 31 items were identified and grouped into four factors: aspiration for nursing development, mission-based team engagement, adaptive thinking, and interpersonal consideration. The overall  $\alpha$  coefficient for the SPSN was 0.927; subscale values ranged from 0.871 to 0.901. Confirmatory factor analysis showed that the model had acceptable fit indices. The SPSN showed significant positive correlations with the Nurse Resilience Scale, Nurse Work Motivation Scale, and Trait Self-Efficacy Scale, with high reliability and validity. The SPSN is a novel robust tool for assessing nurses' staying power. *J. Med. Invest.* 73:153-165, February, 2026

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## INTRODUCTION

In Japan, initiatives such as re-employment support and enhanced training programs have been implemented to curb nurse turnover and improve retention. However, according to the 2024 Hospital Nursing Survey, the turnover rate for full-time nurses remains high at 11.3% (1). Furthermore, the 2023 survey reported that 7% of all nurse resignations were related to changes in working conditions and infection risks during the COVID-19 pandemic (2), highlighting how the pandemic has exacerbated the workforce shortage. Therefore, innovative approaches are urgently needed to reduce turnover and promote retention.

The shortage of nursing staff is a global issue faced by health-care systems worldwide. The International Council of Nurses has noted that the COVID-19 pandemic has intensified nurse turnover, projecting a need for more than 13 million additional nurses by 2030 to resolve the shortage (3). Currently, the global average turnover rate for nurses stands at approximately 15.2%, with 38.4% of nurses indicating an intent to leave, demonstrating the gravity of the situation (4).

Major factors contributing to nurse turnover include unwanted reassignments (5), burnout (6, 7), stress from patients or their families, heavy workloads, and strained relationships with supervisors or colleagues (8). A systematic review further indicated that both personal factors (e.g., stress and dissatisfaction) and organizational factors (e.g., management style and support systems) are critical determinants of turnover (9). Stress management has been identified as a key preventive measure (10), suggesting that effective coping with stress is essential for nurses to continue in their profession.

In recent years, increasing attention has been paid to the

unique strength of nurses who have sustained long careers, a concept referred to as "Staying Power." Researchers have clarified both its structural components (11) and the processes involved in its acquisition and reinforcement (12). "Staying Power" encompasses the collective capabilities that enable nurses to remain in their profession over time. Its components include striving to keep pace with peers, learning from mistakes, maintaining positive thinking, regulating emotions, managing physical and mental health, building positive relationships, fulfilling professional responsibilities, pursuing better nursing practices, and developing individualized work styles (11). The development of "Staying Power" progresses from the foundational stage of learning to function as a team member to developing a personalized work approach, finding meaning in nursing, cultivating professional awareness, and establishing clear future goals (12).

In Western countries, interest in nurse retention emerged in the 1970s, leading to the development of scales that assess professional continuity (13). In Japan, several scales have been developed to evaluate related constructs such as job satisfaction (14, 15), work motivation (16), stress coping (17), resilience (18, 19), and occupational stress (20). While these approaches assess partial aspects of nurses' professional endurance, none capture the holistic, career-sustaining construct of "Staying Power." Thus, no comprehensive or objective measures are available for evaluating this "unique strength" or the developmental stages that enable nurses to sustain their careers.

In 2023, the Japanese Nursing Association released the *Guidelines for Lifelong Learning in Nursing* and the *Nursing Learning Support Book* (21, 22) as resources to promote career development for nursing professionals, emphasizing the importance of enhancing clinical skills through continuous education. However, these resources neither directly address the internal strengths that influence career longevity in nursing nor provide tools for assessing such strengths. Consequently, "Staying Power," which underpins career persistence among nurses, remains largely invisible and rarely evaluated, representing a significant challenge.

Given these insights, the "Staying Power," which nurses have cultivated along with career support tailored to its

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developmental phases and systems designed to nurture and bolster this strength, falls short of adequacy at present. Since individual intrinsic strength plays a profound role in the professional endurance of a nurse, building mechanisms to develop “Staying Power” and establish career support frameworks grounded in that strength requires the development of indicators that can objectively measure this strength with proven validity and reliability.

This study aimed to develop the Staying Power Scale for Nurses (SPSN) and evaluate its reliability and validity. Drawing on fragmented evidence from previous research on nurse retention, this study represents the first attempt to systematically conceptualize and quantify the unique “Staying Power” characteristic of nurses with long-term careers. The development of this scale could provide researchers and practitioners with a validated empirical tool to assess nurses’ “Staying Power,” thereby laying a foundation for future career studies and evidence-based strategies to reduce nurse turnover.

#### *Definitions of Terminology in This Study*

“**Staying Power**” refers to the essential capabilities that nurses acquire through their work, enabling continued professional engagement. These capabilities include internal personality traits and stress-coping strategies (11).

“**Ongoing professional engagement**” refers to continued work as a nurse, encompassing not only remaining in the same workplace but also situations involving job changes or temporary leaves followed by a return to nursing practice.

## **PARTICIPANTS AND METHODS**

### *Participants*

The study included nurses employed at public or national hospitals with 500 or more beds, excluding new graduates and those rehired after retirement. This study aimed to develop a measure of “Staying Power,” defined as a psychological quality that helps prevent turnover among nurses on a regular career path. This concept involves a psychological quality that begins to form in the early stages of employment (11, 12). However, the first year after graduation is marked by significant fluctuation in job adaptation, role acquisition, and clinical practice. Previous research has described this period as a “stage of surviving environmental difficulties” (23). Furthermore, in Japan, the first-year turnover rate for new graduate nurses in 2024 was approximately 8%, indicating that job continuity in the early career stage remains unstable (1). Given that this initial instability could affect measurement reliability, nurses with <1 year of experience were excluded from the study. Re-employed nurses represent a group that has already completed a long-term career and differ in career stage from active nurses who may still possess turnover risk. Including re-employed nurses could extend beyond the intended scope of measurement (i.e., the population bearing turnover risk) and affect the scale’s structure and resulting measurement values. Therefore, nurses re-employed after mandatory retirement were also excluded from the survey population.

Hospitals were selected using the *Secondary Medical Area Database System* provided by Wellness Co., Ltd. (24). A nationwide hospital list (Version 4.0) was first sorted in descending order by bed count, and hospitals using the Diagnosis Procedure Combination system were extracted. Of these, 148 public or national hospitals with 500 or more beds were identified. Written requests for research cooperation were sent to the directors and head nurses of the 148 hospitals. Hospitals agreeing to participate were asked to select 100 nurses per facility, and questionnaires were mailed accordingly. Regardless of position or qualification, nurses were

randomly selected, with 25 individuals from each age group (20s, 30s, 40s, and 50s or older). Some participating hospitals indicated that they could distribute fewer than 100 questionnaires; in such cases, they were asked to ensure that age and position biases were minimized. In total, 2,198 questionnaires were mailed to 25 hospitals.

### *Survey*

From July to September 2025, data were collected using anonymous, self-administered questionnaires. The head nurse of each hospital or department distributed the questionnaires to the selected nurses. Nurses were allowed to submit their responses either by mail or online via a QR code attached to the questionnaire.

### *Survey items*

#### *SPSN main survey version*

The survey was conducted using the 35-item SPSN main survey version developed during a preliminary study.

#### *i. Creation of the SPSN draft*

Based on the authors’ prior research on “Staying Power” (11, 12) of nurses, a 62-item SPSN draft was created, which was organized into the following four categories: “Sense of Professional Responsibility and Aspiration,” “Emotional Regulation Ability,” “Relationship-Building Ability,” and “Clarity of Work Purpose.” To assess the appropriateness, clarity, and ease of responding to items, content validity was evaluated by seven experts, including the present researcher (S.K.) and specialists in relevant fields. The panel consisted of two experts in scale development (R.O., a co-researcher; and M.T.), one expert in nursing education (I.Y., a co-researcher), and three nursing educators (Y.I., H.H., and Y.M.). Experts reviewed the draft items and evaluated them for conceptual relevance, clarity, and appropriateness. The feedback was compiled by S.K. and co-researcher R.O., who discussed the comments and identified necessary revisions. S.K. then revised, integrated, or deleted items, and the revised draft was subsequently reviewed again by R.O. Through this collaborative review process, the accuracy and clarity of the items were improved, confirming the content validity of the scale.

#### *ii. Development of the SPSN Main Survey Version (Preliminary Study)*

The SPSN draft was used in a preliminary study. The target population consisted of 694 nurses from Hospital A with 500 or more beds, and responses were obtained from 428 nurses. After excluding responses with missing values and those from nurses with <1 year of experience and past retirement age, 348 responses were deemed valid (valid response rate, 50.1%). Of the valid respondents, 95.4% were females. The mean age (standard deviation [SD]) was 38.18 (10.5) years, and the average years of nursing experience (SD) was 15.24 (10.3) years. Staff nurses (non-managerial positions) accounted for 81.3% of the respondents. Regarding intent to continue working until retirement, 65.5% responded “somewhat likely,” and 58.4% reported being “satisfied” or “somewhat satisfied” with their jobs (Table 1).

Item analysis and factor analysis were conducted using the principal factor method (Promax rotation). The analyses resulted in the extraction of 35 items across the following four factors: adaptation for nursing development, team facilitation, flexible thinking, and interpersonal consideration. The cumulative contribution ratio before rotation was 64.06%, and inter-factor correlations, measured by Spearman’s rank correlation coefficient, ranged from  $\rho=0.529$  to  $\rho=0.903$ , indicating significant positive correlations. Items with factor loadings of 0.45 or lower were excluded. Cronbach’s coefficients for each factor ranged from 0.890 to 0.940.

Table 1. Characteristics of the participants

Characteristics	Pilot Study (N=348)	Main Study (N=802)
	Mean (SD)	
Age (years)	38.2 (10.5)	40.8 (10.8)
Nursing experience (years)	15.2 (10.3)	17.8 (10.5)
Current hospital employment (years)	13.1 (9.4)	14.4 (10.2)
Department transfer (number of times) * <sup>1</sup>	3.1 (2.9)	3.6 (3.0)
	n (%)	
Gender		
Female	332 (95.4)	740 (92.3)
Male	15 (4.3)	53 (6.6)
Prefer not to answer	1 (0.3)	8 (1.0)
Unanswered	0	1 (0.1)
Education		
High school	4 (1.1)	21 (2.6)
Vocational school	116 (33.3)	466 (58.1)
Junior college	55 (15.8)	77 (9.6)
University	144 (41.4)	206 (25.7)
Master's program	22 (6.3)	30 (3.7)
Doctoral program	1 (0.3)	0
Other	5 (1.4)	1 (0.1)
Unanswered	1 (0.3)	1 (0.1)
Nursing-related licenses (multiple answers) * <sup>2</sup>		
Midwife	35 (10.1)	59 (7.4)
Public Health Nurse	93 (26.7)	125 (15.6)
Employment type at current hospital		
Regular Employee (Full-Time)	277 (79.6)	721 (89.9)
Regular Employee (Part-Time)	52 (14.9)	61 (7.6)
Other than Regular Employee	19 (5.5)	19 (2.4)
Unanswered	0	1 (0.1)
Position at current hospital		
Management (equivalent to Assistant Director of Nursing or Director of Nursing)	4 (1.1)	8 (1.0)
Head Nurse	31 (8.9)	44 (5.5)
Assistant Head Nurse or Team Leader	28 (8.0)	199 (24.8)
Staff (non-managerial)	283 (81.3)	547 (68.2)
Other	2 (0.6)	3 (0.4)
Unanswered	0	1 (0.1)
Job-related qualifications (multiple responses)		
Clinical nurse specialist	4 (1.1)	6 (0.7)
Certified nurse	13 (3.7)	35 (4.4)
Certified nurse administrator	5 (1.4)	18 (2.2)
Specified nurse	4 (1.1)	17 (2.1)
Specified certified nurse	2 (0.6)	7 (0.9)
Other	20 (5.7)	81 (10.1)
N/A	295 (84.8)	643 (80.2)
Are you fulfilling a role that utilizes your qualifications? * <sup>3</sup>	n=46	n=145
Yes	30 (65.2)	102 (70.3)
No	16 (34.8)	40 (27.6)
Unanswered	0	3 (2.1)
Intent to continue as a nurse until retirement		
Very likely	33 (9.5)	104 (13.0)
Somewhat likely	228 (65.5)	497 (62.0)
Very unlikely	68 (19.5)	149 (18.6)
None	19 (5.5)	50 (6.2)
Unanswered	0	2 (0.2)
Satisfaction with current job		
Satisfied	26 (7.5)	39 (4.9)
Somewhat satisfied	177 (50.9)	454 (56.6)
Not very satisfied	128 (36.8)	253 (31.5)
Not satisfied	17 (4.9)	54 (6.7)
Unanswered	0	2 (0.2)

\*<sup>1</sup> Department transfers include transfers to affiliated hospitals or hospital changes due to job transitions. Returning to the same department after maternity leave is not counted as a transfer.

\*<sup>2</sup> Licenses other than nursing.

\*<sup>3</sup> Responses only from those who reported having job-related qualifications. SD=standard deviation ; N/A=not applicable.

Based on these results, 35 items were selected from the original 62-item SPSN draft to create the main questionnaire used to conduct the survey. The questionnaire items were rated on a 5-point scale, ranging from “strongly applies : 5 points” to “does not apply at all : 1 point.” Higher scores indicated greater “Staying Power.”

#### *Scales used for criterion-related and convergent validity testing*

The Resilience Scale for Nurses (RSN) is designed to measure nurses’ ability to overcome adversity (18, 19), and its reliability and validity have been confirmed by its developers (Cronbach’s  $\alpha=0.84$ ). It comprises 22 items organized into four subscales—positive engagement in nursing (eight items), interpersonal skills (five items), presence of private support (five items), and adaptability to novel situations (four items). Responses are rated on a 5-point scale, ranging from “Yes (five points)” to “No (one point),” with higher scores indicating greater resilience. In this study, Cronbach’s  $\alpha$  was 0.865. Three items were negatively worded, and to maintain scoring consistency, they were treated as reverse-scored items, with scores inverted before aggregation and analysis. Previous studies have reported significant associations between resilience and nurses’ intention to remain in or leave their profession (25, 26), demonstrating that resilience functions as a psychological resource supporting career persistence among nurses. Therefore, because nurse resilience is theoretically and conceptually aligned with the notion of “Staying Power,” the RSN was adopted to examine the convergent validity of the SPSN.

The Work Motivation (WM) Scale for Nurses assesses WM from the perspective of enhancing the quality and performance of nurses (16), with reliability and validity established by its developers ( $\omega$  coefficient=0.829). It consists of 12 items across four subscales (three items each)—interest in team coordination, interest in patient support, interest in career advancement, and interest in risk avoidance. Responses are rated on a 4-point scale, ranging from “Not at all interested (one point)” to “Very interested (four points),” with higher scores demonstrating greater WM. Nurses with high WM are assumed to exhibit strong “Staying Power,” making this scale appropriate for criterion-related validity testing. In this study, Cronbach’s  $\alpha$  was 0.878.

The Generalized Self-Efficacy Scale (GSE) consists of 23 items designed to measure an individual’s belief in their ability to perform necessary actions in daily life or unfamiliar situations (self-efficacy). Its reliability and validity have been confirmed by its developers (27). It includes nine positive items and 14 negative items, rated on a 5-point scale ranging from “Strongly agree : five points” to “Not at all : one point,” with higher scores indicating greater self-efficacy. Prior research (11) has suggested that increased self-efficacy contributes to the acquisition and strengthening of “Staying Power.” Therefore, nurses with high self-efficacy are expected to demonstrate strong “Staying Power,” making the scale suitable for criterion-related validity testing. In this study, Cronbach’s  $\alpha$  was 0.865. Negative items were treated as reverse-scored items to ensure scoring consistency, with scores inverted before aggregation and analysis.

#### *Other survey items*

Respondents’ basic demographic information, including gender, age, highest educational qualification, possession of nursing licenses, years of nursing experience, number of departmental transfers, years of service at the current workplace, employment type, job position, possession of nursing-related certifications, intention to continue working as a nurse until retirement (4-point scale), and workplace satisfaction (4-point scale), was collected.

#### *Analysis methods*

Statistical analysis was conducted using SPSS Statistics Version 29.0 and AMOS Version 29.0 with a significance level set at <5%. In scale development research, a traditional empirical rule, a “10-to-1 participant-to-item ratio,” is often used to determine the adequacy of sample size (28). The SPSN developed in this study consisted of 35 items, and valid responses were obtained from 802 nurses, providing a sample-to-item ratio of approximately 23:1. This sample size was deemed sufficient to ensure stability and reliability of the factor structure.

Before conducting the exploratory factor analysis (EFA), the adequacy of the data for factor analysis was examined using the Kaiser–Meyer–Olkin (KMO) measure and Bartlett’s test of sphericity. The results showed a KMO value of 0.923 and Bartlett’s test ( $\chi^2(595)=17933.13, p<0.001$ ), indicating that the data were suitable for factor analysis.

#### *Item analysis*

Ceiling and floor effects were examined, and item-to-total correlations (IT correlations) were calculated to check for response bias. A ceiling effect was defined as a mean plus SD of 5.0 or higher, and a floor effect was defined as a minus SD of 1.0 or lower. Items with IT correlations of 0.30 or below (29) were excluded.

#### *Reliability testing*

Cronbach’s  $\alpha$  coefficients were calculated for each factor and the overall scale.

#### *Validity testing*

Construct validity was verified using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). For EFA, the principal factor method was employed with Promax rotation (oblique rotation). Items with factor loadings of 0.45 or higher were adopted, and the number of factors was determined based on the scree plot method (30) to assess the decline in eigenvalues and a cumulative contribution ratio of 50% or higher (31). Items with loadings of 0.32 or higher on two or more factors were identified as cross-loading items and considered for deletion (28). To finalize the number of factors, the factor structure was compared with the four categories identified during the creation of the SPSN draft.

Based on the 4-factor, 31-item structure ([Nursing Growth Orientation], [Mission-Based Team Engagement], [Flexible Thinking], [Interpersonal Consideration]) obtained from the EFA, CFA was conducted to verify structural validity. The Maximum Likelihood method was adopted for CFA. Model fit was assessed by calculating the  $\chi^2$  value and degrees of freedom (df), Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). Referring to prior research (32), the criteria for model fit were set at CFI and TLI  $\geq 0.90$  and RMSEA  $\leq 0.08$ . Furthermore, based on modification indices (MI), error covariances were set only between items within the same factor that were theoretically highly related.

For convergent validity, the correlation between the SPSN and RSN was examined using Spearman’s rank correlation coefficient. For each SPSN subscale, item scores were summed to calculate subscale scores, and correlations were computed among the SPSN total score, each subscale score, and the RSN total score.

For criterion-related validity, the relationships between the SPSN and WM, as well as GSE, were analyzed using Spearman’s rank correlation coefficient. For each SPSN subscale, item scores were summed to obtain subscale scores, and correlations

were calculated among the SPSN total score, each subscale score, and the total scores of the respective comparison scales.

#### *Ethical considerations*

The study was approved by the Ethics Review Committee for Life Sciences and Medicine at Tokushima University Hospital (Approval No. 4639-1) on June 30, 2025. All participants were provided with written explanations regarding the purpose of the study, methods, voluntary participation, protection of personal information, and data management. Consent was confirmed via a consent checkbox in the questionnaire and submission of responses. Permission to use each scale was obtained from its respective developers.

## RESULTS

Responses were received from 852 participants (response rate, 38.8%). Of the 852 responses, those that lacked consent confirmation, contained missing or duplicate answers in scale items, or provided all responses marked as “3 : Neutral” were excluded, resulting in 802 responses, which were used for analysis (valid response rate, 94.1%).

#### *Participant characteristics*

Table 1 presents the participant characteristics. The average age (SD) of participants was 40.8 (10.8) years, with an average nursing experience of 17.8 (10.5) years and an average tenure at the current hospital of 14.4 (10.2) years. Women accounted for 740 participants (92.3%). The most common educational qualification was vocational school graduation (466 participants, 58.1%), followed by university graduation (206 participants, 25.7%), and junior college graduation (77 participants, 9.6%). Full-time regular employees were the most common employment type (721 participants, 89.9%). Regarding job positions, staff nurses (non-managerial) comprised the majority of respondents (547 participants, 68.2%), followed by assistant head nurses or team leaders (199 participants, 24.8%) and head nurses or above (56 participants, 7.0%). In terms of the intention to continue working as a nurse until retirement, “Somewhat likely” was the most frequent response (497 participants, 62.0%), followed by “Hardly likely” (149 participants, 18.6%) and “Very likely” (104 participants, 13.0%). Concerning job satisfaction, “Somewhat satisfied” was the most common response (454 participants, 56.6%), followed by “Not very satisfied” (253 participants, 31.5%) and “Not satisfied” (54 participants, 6.7%).

#### *Item analysis*

No ceiling or floor effects were observed, and no items had an IT correlation below 0.30.

#### *Reliability testing*

##### *Internal consistency*

The Cronbach's  $\alpha$  coefficient for all 31 items in the final SPSN version was 0.927. For each of the four factors, Cronbach's  $\alpha$  coefficients ranged from 0.871 to 0.901.

##### *Validity verification*

##### *Conceptual validity (exploratory and confirmatory factor analysis)*

Exploratory factor analysis using the principal factor method was conducted for all 35 questionnaire items. The scree plot method and cumulative contribution ratio before rotation were reviewed, and the factor structure was compared with the four categories identified during the SPSN draft creation and preliminary study, leading to the adoption of a four-factor structure. A second factor analysis was performed, and the following

items with factor loadings below 0.45 were excluded: “I have my own beliefs as a nurse” (factor loading, 0.429), “I have my own philosophy of nursing” (factor loading, 0.384), “I make an effort to communicate with people I find difficult” (factor loading, 0.388), and “I have a clear career path as a nurse in my mind” (factor loading, 0.408). Through this process, a 31-item, four-factor structure was finalized, yielding a content-appropriate factor structure for the final SPSN version. The final SPSN version consists of the following: Factor 1 [Adaptation for Nursing Development] (10 items), Factor 2 [Team Engagement Based on Mission Awareness] (10 items), Factor 3 [Interpersonal Consideration] (six items), and Factor 4 [Flexible Thinking] (five items). The cumulative contribution ratio before rotation was 56.51%, and Spearman's rank correlation coefficients among factors ranged from  $\rho=0.241$  to  $\rho=0.548$ , all demonstrating significant positive correlations ( $p<0.01$ ). The results of the EFA are shown in Table 2, and the descriptive statistics for each SPSN subscale are shown in Table 3.

The four factors identified through exploratory factor analysis were composed of items comparable with the four categories extracted during the creation of the SPSN draft. Comparison of these four factors with their subscale items in the preliminary study showed that they were composed of similar items.

Based on the 4-factor, 31-item structure obtained from EFA, CFA was conducted. The fit indices for the 4-factor model were  $\chi^2/df=7.945$ , CFI=0.806, TLI=0.789, RMSEA=0.093. After setting error covariances for three sets of items with high content-relatedness (e3 $\leftrightarrow$ e6, e13 $\leftrightarrow$ e14, e27 $\leftrightarrow$ e30) based on the modified index (MI) and re-estimating, the fit indices were  $\chi^2/df=5.769$ , CFI=0.868, TLI=0.855, RMSEA=0.077. The CFA path diagram is shown in Figure 1.

##### *Convergent validity testing ( $p<0.01$ )*

A strong positive correlation was observed between the SPSN and RSN, with a correlation coefficient of  $\rho=0.728$ . Moderate-to-strong positive correlations were also found between the RSN and SPSN subscales—adaptation for nursing development ( $\rho=0.595$ ), team engagement based on mission awareness ( $\rho=0.555$ ), flexible thinking ( $\rho=0.515$ ), and ( $\rho=0.355$ ) (Table 4).

##### *Criterion-related validity testing ( $p<0.01$ )*

The correlation coefficient between the SPSN and WM was  $\rho=0.609$  for the total score, with subscale correlations as follows: adaptation for nursing development ( $\rho=0.526$ ), team engagement based on mission awareness ( $\rho=0.572$ ), flexible thinking ( $\rho=0.274$ ), and interpersonal consideration ( $\rho=0.303$ ). The correlation coefficient between the SPSN and GSE was  $\rho=0.576$  for the total score, with subscale correlations as follows: adaptation for nursing development ( $\rho=0.461$ ), mission-based team engagement ( $\rho=0.478$ ), flexible thinking ( $\rho=0.405$ ), and interpersonal consideration ( $\rho=0.241$ ) (Table 4).

## DISCUSSION

### *Scale structure*

The finalized SPSN scale comprised 31 items grouped into the following four factors: adaptation for nursing development, mission-based team engagement, flexible thinking, and interpersonal consideration. These factors, taken together, captured the multidimensional aspects of nurses' “Staying Power,” each representing psychological attributes that support long-term career commitment.

The first factor, adaptation for nursing development, reflected the inner drive to advance professional skills and maintain a trajectory of growth as a nurse. Nurses are expected to build

**Table 2.** Exploratory factor analysis of the Staying Power Scale for Nurses (N=802)

Factor/Questions	Factor loading			
	I	II	III	IV
<b>Factor 1 : Adaptation for Nursing Development (10 items, <math>\alpha=0.897</math>)</b>				
7. I want to learn and grow each time I encounter something new.	0.809	-0.044	0.030	0.042
2. I find continuous learning enjoyable.	0.785	-0.026	0.024	0.038
3. I strive to improve my skills driven by a desire not to lose to myself.	0.759	-0.085	0.058	-0.094
5. I believe nurses need to keep learning, and I do not find it burdensome.	0.732	0.074	-0.042	0.048
1. I enjoy learning new things.	0.719	-0.035	0.044	0.009
4. I have a habit of learning proactively.	0.683	0.084	-0.057	0.037
9. I work with the ambition not only to keep up with others but also to surpass them.	0.646	-0.036	0.002	-0.164
6. I strive to enhance my skills motivated by a desire to avoid falling behind others.	0.640	-0.070	-0.007	-0.113
12. I aim to grow further and provide high-quality nursing care.	0.535	0.067	0.005	0.130
8. When I feel that my knowledge or skills are lacking, I take the initiative to learn.	0.532	0.079	-0.064	0.169
<b>Factor 2 : Mission-Based Team Engagement (10 items, <math>\alpha=0.901</math>)</b>				
14. I can take the initiative to speak up	-0.070	0.860	-0.059	-0.205
16. I clearly understand the mission that I am required to fulfill.	-0.009	0.769	0.057	0.005
15. I clearly understand the role that I am required to play.	0.032	0.758	0.049	-0.023
19. I want to share lessons learned from my experiences with team members.	0.098	0.707	-0.046	-0.004
17. I can take the initiative to act.	0.021	0.706	0.018	-0.059
13. I create an atmosphere where team members can openly share their opinions.	-0.115	0.655	-0.020	0.144
20. When someone is struggling with workplace relationships, I step in to mediate.	-0.051	0.625	-0.087	0.116
21. I aim to leverage my past experiences to help team members improve their skills.	0.226	0.618	-0.066	-0.008
18. I sometimes tell jokes to lighten the atmosphere.	-0.108	0.609	0.053	-0.050
23. I want to use lessons from my experiences to create a better workplace.	0.228	0.511	-0.012	0.136
<b>Factor 3 : Flexible Thinking (6 items, <math>\alpha=0.871</math>)</b>				
26. I strive to view negative events in a positive light.	0.034	-0.062	0.893	-0.024
27. I aim to approach things with a positive mindset.	0.038	-0.002	0.866	-0.020
28. I can adapt to changing situations and shift my emotions flexibly.	-0.071	0.136	0.751	0.035
25. I try not to dwell on things that are beyond my control.	-0.060	-0.116	0.701	0.047
29. I am resilient and can face difficulties head-on.	0.145	0.205	0.574	-0.070
30. I believe that time will resolve painful experiences.	0.013	-0.080	0.522	0.062
<b>Factor 4 : Interpersonal Consideration (5 items, <math>\alpha=0.875</math>)</b>				
32. I can interact with colleagues at the workplace with a tolerant attitude.	-0.125	0.053	0.067	0.856
33. I approach colleagues at the workplace with a compassionate mindset.	-0.120	0.064	0.076	0.799
34. I am careful about the content of what I say.	0.113	-0.102	-0.067	0.738
31. I am mindful of my attitude.	0.060	-0.055	-0.047	0.728
35. I strive to avoid emotional reactions to others' mistakes.	-0.019	-0.032	0.049	0.723

Exploratory factor analysis was conducted using the principal factor method with Promax rotation. The number of factors was determined based on the scree plot and cumulative contribution ratio. The Cronbach's  $\alpha$  coefficient for the entire scale was 0.927.

Table 3. Descriptive statistics of the Staying Power Scale for Nurses (n = 802)

Subscale	Range	Min	Max	Mean (total)	SD	Mean item score
Adaptation for nursing development	10–50	10	50	33.89	6.72	3.39
Mission-based team engagement	10–50	11	50	36.26	6.37	3.63
Flexible thinking	6–30	6	30	19.75	4.65	3.29
Interpersonal consideration	5–25	5	25	20.17	2.82	4.03

Note : SPSN=Staying Power Scale for Nurses ; Range indicates the theoretical total score range for each subscale, based on a five-point Likert scale (1–5) ; Mean item score represents the average score per item within each subscale (total score divided by the number of items), allowing for comparison among subscales ; in this study (N=802), the observed minimum score for the “mission-based team engagement” subscale was 11 ; SD=standard deviation.

Table 4. Correlation between scales

	SPSN total score	Adaptation for nursing development	Mission-based team engagement	Flexible thinking	Interpersonal consideration
RSN	0.728**	0.595**	0.555**	0.515**	0.355**
WM	0.609**	0.526**	0.572**	0.274**	0.303**
GSE	0.576**	0.461**	0.478**	0.405**	0.241**

Note : Spearman’s rank correlation coefficient was used. \*\* $p < 0.01$ .

SPSN, The Staying Power Scale for Nurses ; RSN, Resilience Scale for Nurses ; WM, Work Motivation Scale for Nurses ; GSE, Generalized Self-Efficacy Scale.

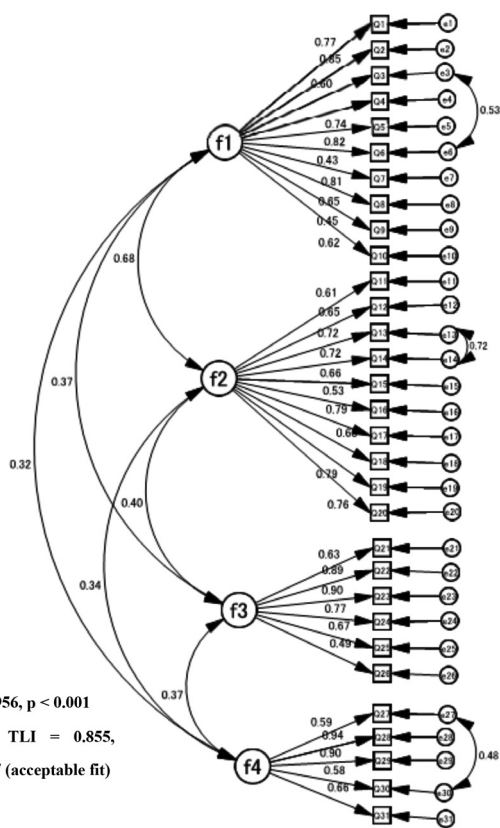


Figure 1. Confirmatory factor analysis of the Staying Power Scale for Nurses (N=802)

Q1–Q31 correspond to the final 31 items listed in the Appendix.

expertise through ongoing practice, refining their clinical decision-making and care delivery. This aligns with Benner’s framework, which elaborates the professional process of evolving from a novice to an expert (33), where the desire to “deepen knowledge” and “enhance nursing practice” steers professional growth and underpins career persistence. Recent international studies underscored the critical role of continuing professional development (CPD) in nursing. Mlambo *et al.*’s meta-synthesis on lifelong learning and CPD showed that attitudes, values, and motivations toward learning directly bolstered professional competence and development (34). This suggests that a nurse’s commitment to growth transcends personal ambition, functioning as a cornerstone for advancing professional skills and improving clinical outcomes. Consequently, nursing development and adaptation are regarded as pivotal elements of “Staying Power,” anchoring nurses’ professional identity. This subscale encapsulates the capacity to sustain a career through a consistent focus on learning and growth, simultaneously enhancing the quality of clinical practice.

The second factor, mission-based team engagement, represents an attitude in which nurses clearly recognize their own missions and roles and proactively engage in team collaboration and workplace growth based on that awareness. It indicates that proactive actions rooted in an individual’s “inner sense of mission” lead to the revitalization of the entire team and the formation of a supportive culture. This factor was identified as a key element constituting the strength to continue working. Traditionally, teamwork and workplace environment have been regarded as external factors. For instance, Chang *et al.*’s umbrella review on nurse turnover highlighted that the majority of turnover factors were organizational, including workplace environment, leadership, and teamwork (35). This interpretation underscored that team-related elements had typically been treated as environmental factors rather than individual internal resources. However, this study suggests that an individual’s proactive engagement with the team is a measurable component of “Staying Power.” Bandura’s concept of “collective efficacy,”

which refers to a team's ability to address challenges through collaboration (36), supports the idea that collective efficacy can enhance individual self-efficacy (37), suggesting a reciprocal relationship between personal and team resources. This lends theoretical support to the coherence of this factor. Consequently, nurses' proactive involvement in the team, driven by a sense of mission, can reflect both the collaborative nature of interpersonal relationships (the relational aspect) and the sense of purpose and mission toward their duties (the mission-oriented element), which constitute the "strength to continue working" captured by SPSN.

The third factor, flexible thinking, captures the capacity of a nurse to adapt emotionally and in perspective when confronted with challenges or setbacks, enabling a constructive reappraisal of situations. This factor includes traits, such as optimism, emotional self-regulation, and resilience to adversity, primarily assessing adaptability rooted in emotional flexibility. It corresponds closely with psychological concepts, namely, affective flexibility (38) and expressive flexibility (39). Affective flexibility refers to the ability to adjust emotional responses to situational demands, and it is significantly associated with resilience (38). Expressive flexibility, the capacity to enhance or restrain emotional expression as needed, can improve adaptation following stress or loss and support sustained psychological well-being (39). These insights confirm that this factor aligns with resilience-related traits driven by emotional adaptability. Moreover, given that cognitive flexibility and resilience are key predictors of job embeddedness among nurses (40), flexible thinking can be understood as a psychological element of "Staying Power," facilitating coping with high-pressure contexts. Optimism, recognized as a vital psychological resource that mitigates stress responses, reduces depressive tendencies, and fosters health preservation (41), is embodied in this factor through items such as "I strive to see negative events in a positive light" and "I aim to approach things with a positive mindset." These components underscore the validity of flexible thinking as a critical psychological contributor to the "Staying Power" of nurses.

The fourth factor, interpersonal consideration, comprises items reflecting the inclination of a nurse to maintain respectful, harmonious communication within workplace relationships, embodying traits such as respect for others, mindful speech and behavior, and emotional self-control. These characteristics highlight an individual's behavioral tendencies in managing interpersonal interactions. Nursing professionals are required to collaborate not only with patients and their families but also with various healthcare professionals. Job satisfaction (35, 42) and organizational commitment (43) of nurses can reduce turnover intentions and enhance retention within organizations. Conversely, workplace incivility has been consistently linked to increased turnover intentions (44), underscoring the significant impact of relationship quality on career longevity. In such contexts, the ability to temper emotional reactions and respond constructively, as captured by the items of this factor, acts as a critical mechanism for mitigating negative relational spirals. In addition, organizational support and a supportive workplace culture can reduce turnover intentions (45). Organizational support represents an "external environmental resource." Interpersonal consideration refers to an "internal personal strength." If an individual reacts emotionally or escalates interpersonal conflicts, despite robust institutional support, the effectiveness of the institutional support to resolve the issue may be limited. Conversely, a high level of interpersonal consideration enables individuals to reduce friction and adapt to the workplace, thereby enhancing their capacity to continue working, even in environments with limited organizational support. Thus, interpersonal consideration is positioned as an interpersonal dimension of the

"Staying Power," reducing friction and conflict in relationships and promoting workplace adaptation. Although it can function complementarily with organizational support and a supportive culture, this factor has been included as an individual-level subscale within the SPSN framework.

#### *Scale reliability*

The SPSN demonstrated sufficient reliability. The Cronbach's  $\alpha$  coefficients for the subscales ranged from 0.871 to 0.901, and for the entire scale, it was 0.927, indicating high internal consistency. Moreover, item analysis demonstrated no ceiling or floor effects, and IT correlations for all items were 0.30 or higher ( $p < 0.01$ ). These findings suggest that each item consistently contributes to the overall scale measurement, indicating that the SPSN can reliably assess the "Staying Power" of nurses. Therefore, the SPSN can be regarded as a robust tool for measuring this construct with high reliability.

#### *Scale validity*

##### *Construct validity*

The four-factor structure of SPSN obtained in this study ([Nursing Growth Orientation], [Mission-Based Team Engagement], [Flexible Thinking], [Interpersonal Consideration]) generally aligns with the four categories proposed in the original draft (sense of responsibility and ambition as a professional, emotional regulation ability, interpersonal skills, and sense of mission in one's duties), indicating that SPSN possesses a multifaceted structure grounded in a theoretical framework. While sharing the overarching concept of "strength to continue working," each factor measures distinct psychological aspects, suggesting the scale possesses construct validity.

Although CFA results showed CFI and TLI slightly below benchmark values, RMSEA remained within acceptable limits, and the model generally supported the theoretical framework. Nurses' "strength to continue working" is not a single psychological trait but a concept composed of multifaceted elements such as growth orientation, team involvement, flexibility, and interpersonal consideration. Consequently, it is difficult to represent as a pure univariate model, and it is possible that the factors form a structure with partial overlap and mutual interrelationships. Considering this, the slightly lower CFI and TLI values reflect conceptual complexity and do not compromise theoretical validity. Furthermore, examining the MI revealed that adding covariance between conceptually proximate items within the same factor (e.g., "I clearly understand the mission I should fulfill" and "I want to share what I learn from my experiences with team members") improved model fit. These items theoretically share the content of "practical actions based on a sense of mission," and adding the error covariance was judged reasonable as a statistical procedure.

Therefore, the SPSN possesses a multi-factor structure consistent with its theoretical background. Given that the model fit was within an acceptable range, the structural validity of this scale is generally supported.

##### *Convergent validity*

A strong positive correlation ( $\rho = 0.728$ ,  $p < 0.01$ ) was noted between the total scores of the SPSN and RSN. For the subscales, correlations were as follows: adaptation for nursing development ( $\rho = 0.595$ ), mission-based team engagement ( $\rho = 0.555$ ), flexible thinking ( $\rho = 0.515$ ), and interpersonal consideration ( $\rho = 0.355$ ) (all  $p < 0.01$ ). These results support the conceptual proximity between the two scales, indicating that the SPSN accurately captures nurses' psychological strengths and adaptability to adversity, thereby confirming its convergent validity.

*Criterion-related validity*

Both WM and GSE showed significant positive correlations with SPSN ( $p < 0.01$ ). The correlation of total score with WM was  $\rho = 0.609$ , with mission-based team engagement demonstrating the strongest subscale correlation ( $\rho = 0.572$ ,  $p < 0.01$ ). This alignment is consistent with the idea that mission-based team engagement, which reflects nurses' proactive efforts to contribute to their teams based on a strong sense of mission and role awareness, corresponds closely with higher work motivation, particularly in terms of team collaboration and contribution.

Conversely, the correlation of total score with GSE was  $\rho = 0.576$  ( $p < 0.01$ ), with subscale correlations ranging from weak to moderate ( $\rho = 0.241$  to  $\rho = 0.478$ ). Flexible thinking and adaptation for nursing development demonstrated moderate correlations ( $\rho = 0.405$  and  $\rho = 0.461$ , respectively), whereas interpersonal consideration showed a weaker correlation ( $\rho = 0.241$ ) (all  $p < 0.01$ ). This variation arises because while the GSE assesses the internal confidence of an individual in their capabilities, the SPSN incorporates broader dimensions, including relational and practical elements (team engagement and interpersonal dynamics). The presence of stronger correlations for subscales, such as mission-based team engagement, which emphasizes proactive team involvement, alongside weaker correlations for those, such as interpersonal consideration, which centers on relational consideration, suggests that the SPSN measures distinct aspects that cannot be fully captured by existing psychological scales. This pattern supports the criterion-related validity of the SPSN. These findings confirm that SPSN aligns theoretically with work motivation and self-efficacy, particularly through active relational strengths, such as mission-based team engagement. Consequently, the presence of subscales with lower correlations with self-efficacy underscores the ability of the SPSN to measure multifaceted elements beyond individual traits, affirming its validity and unique contribution.

*Importance and novelty of the study*

The significance of this study lies in its shift from examining nurses' career longevity solely through the lens of "turnover factors" or "workplace conditions" to focusing on their inherent "Staying Power." By directly assessing the elements of this strength, factor analysis identified four key components: adaptation for nursing development, mission-based team engagement, flexible thinking, and interpersonal consideration. Furthermore, while SPSN is conceptually related to the RSN, it distinguishes itself by encompassing professional and practical aspects, such as nurses' growth orientation, active involvement in teams, and interpersonal consideration, whereas the RSN emphasizes adaptability and psychological persistence in challenging situations. Therefore, the SPSN complements the resilience concept and can be positioned as a new measure that visualizes nurses' "ability to continue working authentically." In clinical settings, the SPSN can be used by nurse managers to identify early signs of decreased staying power among staff nurses and to provide timely support or mentoring. The scale may also assist in planning individualized career development by highlighting each nurse's psychological strengths and areas for potential growth. Moreover, the scale offers practical utility in clinical settings. It can be applied in career guidance or training programs to identify strengths that nurses should cultivate and areas where they may face challenges. This enables the creation of tailored interventions, such as programs to nurture a growth mindset, workshops to enhance team collaboration, mental health initiatives to foster adaptive stress management, or communication training to strengthen interpersonal skills. Furthermore, SPSN can be applied at the individual level for career support and at the organizational and policy levels for the development of

retention strategies and human resource development policies for nursing staff. For example, utilizing SPSN enables facilities to identify trends in "strength to continue working," allowing for early identification of departments and groups with high turnover risk. This facilitates the design of evidence-based retention measures and workplace improvement strategies.

Therefore, the scale developed in this study possesses practical utility that extends beyond diagnosing nurses' current status. It can contribute to designing career support and education/training programs, evaluating the effectiveness of organizational support, and formulating talent acquisition and retention strategies from a policy perspective. The uniqueness and clinical significance of this research lie in the scale's ability to visualize the multifaceted "strength to continue working" possessed by individual nurses and to link the development and support of this strength to organizational and institutional levels.

*Limitations and future directions*

This study has several limitations. First, the study population was limited to nurses working at large hospitals with 500 beds or more, which does not fully represent diverse work settings, such as small-to-medium-sized hospitals, community-based care wards, and home-based care environments. Future research should explore the application of this scale across different hospital sizes, work arrangements, and clinical specialties. Second, because this study used a cross-sectional survey design, it did not directly establish a causal relationship between SPSN scores and career continuation intent. Longitudinal studies are needed to examine changes in scale scores over time and their associations with job satisfaction and turnover intentions, thereby establishing the predictive validity of the scale. Third, the SPSN is a self-reported questionnaire, which may be susceptible to social desirability bias (46). To enhance objectivity, future studies should consider incorporating additional evaluation methods, such as interviews or peer assessments, to measure nurses' "Staying Power" from multiple perspectives. Fourth, the validation scales used in this study (resilience, work motivation, and self-efficacy) focus on psychological traits, leaving the relationship with organizational or environmental factors underexplored. Future research should conduct comprehensive analyses that include external factors, such as organizational support, leadership, and teamwork culture, to clarify how the SPSN functions within organizational contexts. Additionally, although several SPSN items assess general psychological strengths, these attributes emerged from qualitative studies with nurses and reflect the distinctive emotional, interpersonal, and situational demands of nursing practice. Addressing these limitations through further research will contribute to building support systems that enable nurses to remain in their roles and grow professionally. In the long term, the scale could be applied to evaluate the effectiveness of career support programs and serve as a metric for assessing educational and training initiatives.

**CONCLUSIONS**

In conclusion, this study developed and validated SPSN as a reliable and valid measure of nurses' ability to sustain their professional engagement. SPSN captures nurses' intrinsic and relational strengths, such as growth orientation, mission-based team engagement, flexible thinking, and interpersonal consideration, which contribute to long-term career sustainability. The scale offers practical utility for use in clinical settings, education, and workforce development to identify areas for professional support and intervention. Future studies should apply the SPSN across diverse nursing contexts and examine its predictive

validity through longitudinal research.

## CONFLICT OF INTEREST DISCLOSURE

The authors declare no conflicts of interest.

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## ETHICAL APPROVAL

The study was approved by the Ethics Review Committee for Life Sciences and Medicine at Tokushima University Hospital (Approval No. 4639-1 ; June 30, 2025). Informed consent was obtained from all participants. The study was performed in accordance with the principles of the Declaration of Helsinki.

## REFERENCES

1. Japanese Nursing Association (Ed.): 2024 Hospital Nursing Status Survey. Japan Nursing Association Research Report No. 101 : 11, 2025
2. Japanese Nursing Association (Ed.): 2023 Hospital Nursing Status Survey. Japan Nursing Association Research Report No. 100 : 12, 2024
3. International Council of Nurses : ICN Policy Brief-The Global Nursing Shortage and Retention (2021). Available from : [https://www.icn.ch/sites/default/files/2023-04/ICN%20Policy%20Brief\\_Nurse%20Shortage%20and%20Retention.pdf](https://www.icn.ch/sites/default/files/2023-04/ICN%20Policy%20Brief_Nurse%20Shortage%20and%20Retention.pdf) (Accessed June 5, 2025)
4. Mafula D, Arifin H, Chen R, Sung CM, Lee CK, Chiang KJ, Banda KJ, Chou KR : Prevalence and moderating factors of turnover rate and turnover intention among nurses worldwide : A meta-analysis. *J Nurs Regul* 15 : 20-36, 2025
5. Bae SH : Assessing the impacts of nurse staffing and work schedules on nurse turnover : A systematic review. *Int Nurs Rev* 71 : 168-179, 2023
6. Kelly LA, Gee PM, Butler RJ : Impact of nurse burnout on organizational and position turnover. *Nurs Outlook* 69 : 96-102, 2021
7. Bae SH : Nurse staffing, work hours, mandatory overtime, and turnover in acute care hospitals affect nurse job satisfaction, intent to leave, and burnout : A cross-sectional study. *Int J Public Health* 69 : 1-9, 2024
8. Lee KE, Kim SJ : Nursing stress factors affecting turnover intention among hospital nurses. *Int J Nurs Pract* 26 : e12819, 2020
9. Halter M, Boiko O, Pelone F, Beighton C, Harris R, Gale J, Gourlay S, Drennan V : The determinants and consequences of adult nursing staff turnover : A systematic review of systematic reviews. *BMC Health Serv Res* 17 : 824, 2017
10. Nakano S, Iwasa Y : A Japanese literature review on the work continuation of mid-career nurses : Focus on the reasons for leaving and career continuation. *J Nurs Investig* 16 : 10-22, 2019
11. Nakano S, Iwasa Y, Kishida S : The structure of staying power, the set of skills that empower nurses long-term continuation in the profession. *JJSNR* 45 : 283-296, 2022
12. Kamishirakawa S, Okahisa R : Obtaining and strengthening the "staying power" of veteran nurses. *J Nurs Investig* 23 : 1-17, 2025
13. Stamps PL : *Nurses and Work Satisfaction : An Index for Measurement*. Health Administration Press, Chicago, 1997
14. Mineko Y : Job satisfaction in Japanese nurses. *J Adv Nurs* 22 : 158-164, 1995
15. Muya M, Katsuyama K, Aoyama H : Study of the reliability and validity of a job satisfaction measurement scale for nurses working in hospitals. *Bulletin of Social Medicine* 31 : 37-44, 2014
16. Nishimura N, Dei R, Yamamoto C, Yamaguchi M, Nakajima K : Development of a work motivation scale for nurses. *Bulletin of Social Medicine* 34 : 27-34, 2017
17. Adachi H, Inoue M, Inaba R : Stress management among hospital nurses application to nurses of stress & stress-coping scale (SSCQ). *J Occup Health* 47 : 1-10, 2005
18. Ihara H, Ogata H, Inuzuka A, Ohta N, Nagai T, Mizuno M : Development and psychometric validation of the resilience scale for nurses. *JSGHP* 22 : 210-220, 2010
19. Hiroyuki O, Hiroshi I, Aya I, Noriko O, Motoki M : Development of a resilience scale for nurses and assessment of its reliability and validity. *Clinical psychiatry* 52 : 785-792, 2010
20. Murakami M, Maeda H : Development of a job stress scale for new graduate nurses. *JJSNR* 33 : 133-139, 2010
21. Japanese Nursing Association : *Guidelines for Lifelong Learning in Nursing*, 2023. <https://www.nurse.or.jp/nursing/assets/learning/lllearning-guide.pdf> (Accessed June 12, 2025)
22. Japanese Nursing Association : *Nursing Learning Support Book*, 2023. <https://www.nurse.or.jp/nursing/assets/learning/support-learning-guide-all.pdf> (Accessed June 12, 2025)
23. Aiyoshi H, Sakyō Y : The survival process of newly graduated Japanese nurses in their first year of clinical practice : A qualitative study using modified grounded theory approach. *J Int Nurs Res* 4 : e2023-0035, 2025
24. Wellness Co., Ltd. : *Secondary Medical Area Database* Download. [https://www.wellness.co.jp/service/2ndary\\_medical\\_area/](https://www.wellness.co.jp/service/2ndary_medical_area/) (Accessed June 12, 2025)
25. Pu J, Wang W, Li G, Xie Z, Fan X, Zhan N, Xu Y, Huang H : Psychological resilience and intention to stay among nurses : The mediating role of perceived organizational support. *Front Psychol* 15 : 1407206, 2024
26. Poku CA, Bayuo J, Agyare VA, Sarkodie NK, Bam V : Work engagement, resilience and turnover intentions among nurses : A mediation analysis. *BMC Health Serv Res* 25 : 71, 2025
27. Narita K, Shimonaka Y, Nakazato K, Kawaai C, Sato S, Osada K : A Japanese version of the generalized self-efficacy scale : Scale utility from the life-span perspective. *Jpn J Educ Psychol* 43 : 306-314, 1995
28. Costello AB, Osborne JW : Best practices in exploratory factor analysis : Four recommendations for getting the most from your analysis. *Pract Assess Res Eval* 10 : 1-9, 2005
29. Polit DF, Beck CT : *Nursing Research - Principles and Methods*. Translated by Kondo J. Igaku-Shoin, Tokyo, 2018, pp.436
30. Murakami Y : *How to Create Psychological Scales*. Kitaohji Shobo, Kyoto, 2021
31. Yonekawa K, Yamazaki S : *SPSS Statistical Analysis Manual for Beginners - From basics to multivariate analysis*. Kitaohji Shobo, Kyoto, 2022

32. Sathyanarayana S, Mohanasundaram T : Fit Indices in Structural Equation Modeling and Confirmatory Factor Analysis : Reporting Guidelines. *Asian J Econ Busin Acc* 24 : 561-577, 2024
33. Benner P : From Novice to Expert : Excellence and power in clinical nursing practice. Addison-Wesley, Menlo Park, 1984
34. Mlambo M, Silén C, McGrath C : Lifelong learning and nurses' continuing professional development, a metasynthesis of the literature. *BMC Nurs* 20 : 62, 2021
35. Chang SY, Sunaryo EYAB, Kristamuliana K, Lee HF, Chen CM : Factors influencing nurses' turnover : An umbrella review. *Nurs Outlook* 73 : 102464, 2025
36. Bandura A : Exercise of human agency through collective efficacy. *Curr Dir Psychol Sci* 9 : 75-78, 2000
37. Wilson L, Sheridan L, Alonzo D, Middleton R : The personal and collective resources of nurses and the relationship to job commitment and work engagement. *J Adv Nurs* 81 : 6893-6906, 2025
38. Rademacher L, Kraft D, Eckart C, Fiebach CJ : Individual differences in resilience to stress are associated with affective flexibility. *Psychol Res* 87 : 1862-1879, 2022
39. Bonanno GA, Papa A, Lalande K, Westphal M, Coifman K : The importance of being flexible : The ability to enhance and suppress emotional expression predicts long-term adjustment. *Psychol Sci* 15 : 482-487, 2004
40. Yang NY, Baek JY, Kim KE, Park JE : Influence of cognitive flexibility, resilience, and professional quality of life on job embeddedness of nurses. *J Home Health Care Nursing (Korea)* 30 : 174-182, 2023
41. Carver CS, Scheier MF, Segerstrom SC : Optimism. *Clin Psychol Rev* 30 : 879-889, 2010
42. Şahin M, Bektaş G, Nal M, Küçükkurt AC : The mediating role of job satisfaction related to nurse–nurse collaboration and turnover intention. *BMC Nurs* 24 : 235, 2025
43. Yılmaz G, Kıran Ş, Bulut HK : The mediating role of nurse–physician collaboration in the relationship between organizational commitment and turnover intention. *J Interprof Care* 37 : 66-72, 2022
44. Namin BH, Øgaard T, Røislien J : Workplace incivility and turnover intention in organizations : A meta-analytic review. *Int J Environ Res Public Health* 19 : 25, 2022
45. Galanis P, Moisoglou I, Papathanasiou IV, Malliarou M, Katsiroumpa A, Vraka I, Siskou O, Konstantakopoulou O, Kaitelidou D : Association between organizational support and turnover intention in nurses : A systematic review and meta-analysis. *Healthcare (Basel)* 12 : 291, 2024
46. Tani I : Development of Japanese version of Balanced Inventory of Desirable Responding (BIDR-J). *Jpn J Personal* 17 : 18-28, 2008

## Appendix 1. The Japanese Version of the Staying Power scale for Nurses (31 items)

	はい	はい どちらか かという と	どちら でも ない	いい え どちらか という と	いい え
看護師の仕事の中で次の事柄はあなたにどの程度当てはまりますか？ 当てはまるところに○をつけてください。					
1 新しいことに出会うたびに自ら学び成長したいと思う	5	4	3	2	1
2 学び続けることは楽しいと思う	5	4	3	2	1
3 自分に負けたくないという思いでスキルアップに励んでいる	5	4	3	2	1
4 看護師は学び続ける必要があるが、それも嫌ではないと思う	5	4	3	2	1
5 新しいことを学ぶことが好きだ	5	4	3	2	1
6 主体的に学習する習慣がある	5	4	3	2	1
7 周囲に追いつくだけでなく、追いつきたいと思って働いている	5	4	3	2	1
8 他の人に負けたくないという思いでスキルアップに励んでいる	5	4	3	2	1
9 今以上に成長して質の高い看護を提供していきたいと思う	5	4	3	2	1
10 自分の知識や技術に未熟さを感じた際には自ら進んで学習することができる	5	4	3	2	1
11 自ら率先して発言ができる	5	4	3	2	1
12 自分が果たすべき役割を明確に理解している	5	4	3	2	1
13 自分が果たすべき使命を明確に理解している	5	4	3	2	1
14 自分の経験からの学びをチームメンバーに伝えていきたい	5	4	3	2	1
15 自ら率先して行動ができる	5	4	3	2	1
16 メンバーが率直に意見を言い合えるような雰囲気をつくっている	5	4	3	2	1
17 職場の人間関係で困った人がいる時には間に入って調整している	5	4	3	2	1
18 これまでの経験を活かしチームメンバーのスキルアップを図りたい	5	4	3	2	1
19 その場の雰囲気を和らげるために、冗談を言うことがある	5	4	3	2	1
20 自分の経験からの学びを活かして、よりよい職場にしていきたい	5	4	3	2	1
21 嫌なことがあってもポジティブに捉えるようにしている	5	4	3	2	1
22 物事をプラスの方向へ考えるようにしている	5	4	3	2	1
23 状況の変化に対応し、柔軟に気持ちを切り替えることができる	5	4	3	2	1
24 自分ではどうしようもないことは、気にしないようにしている	5	4	3	2	1
25 逆境に強く困難に立ち向かうことができる	5	4	3	2	1
26 辛いことは時間が解決してくれると思う	5	4	3	2	1
27 職場の人に対して寛容な態度で接することができる	5	4	3	2	1
28 職場の人に対して寛容な気持ちで接することができる	5	4	3	2	1
29 自分が話す内容には気をつけている	5	4	3	2	1
30 自分の態度には気をつけている	5	4	3	2	1
31 他人のミスに対して感情的な対応をしないようにしている	5	4	3	2	1

Appendix 2. The English Translation of the Staying Power scale for Nurses (31 items)

To what extent do the following aspects apply to you in your nursing work? Please mark a circle for the response that applies.	Yes	Somewhat yes	Neutral	Somewhat no	No
1 I want to learn and grow each time I encounter something new.	5	4	3	2	1
2 I find continuous learning enjoyable.	5	4	3	2	1
3 I strive to improve my skills driven by a desire not to lose to myself.	5	4	3	2	1
4 I believe nurses need to keep learning, and I don't find it burdensome.	5	4	3	2	1
5 I enjoy learning new things.	5	4	3	2	1
6 I have a habit of learning proactively.	5	4	3	2	1
7 I work with the ambition not only to keep up with others but also to surpass them.	5	4	3	2	1
8 I strive to enhance my skills, motivated by a desire not to fall behind others.	5	4	3	2	1
9 I aim to grow further and provide high-quality nursing care.	5	4	3	2	1
10 When I feel my knowledge or skills are lacking, I take the initiative to learn.	5	4	3	2	1
11 I can take the initiative to speak up.	5	4	3	2	1
12 I clearly understand the role that I am required to play.	5	4	3	2	1
13 I clearly understand the mission that I am required to fulfill.	5	4	3	2	1
14 I want to share lessons learned from my experiences with team members.	5	4	3	2	1
15 I can take the initiative to act.	5	4	3	2	1
16 I create an atmosphere where team members can openly share their opinions.	5	4	3	2	1
17 When someone is struggling with workplace relationships, I step in to mediate.	5	4	3	2	1
18 I aim to leverage my past experiences to help team members improve their skills.	5	4	3	2	1
19 I sometimes tell jokes to lighten the atmosphere.	5	4	3	2	1
20 I want to use lessons from my experiences to create a better workplace.	5	4	3	2	1
21 I strive to view negative events in a positive light.	5	4	3	2	1
22 I aim to approach things with a positive mindset.	5	4	3	2	1
23 I can adapt to changing situations and shift my emotions flexibly.	5	4	3	2	1
24 I try not to dwell on things that are beyond my control.	5	4	3	2	1
25 I am resilient and can face difficulties head-on.	5	4	3	2	1
26 I believe that time will resolve painful experiences.	5	4	3	2	1
27 I can interact with workplace colleagues with a tolerant attitude.	5	4	3	2	1
28 I approach workplace colleagues with a compassionate mindset.	5	4	3	2	1
29 I am careful about the content of what I say.	5	4	3	2	1
30 I am mindful of my attitude.	5	4	3	2	1
31 I strive to avoid emotional reactions to others' mistakes.	5	4	3	2	1